



Sierrita Operations
PO Box 527
Green Valley, Arizona 85622

August 6, 2013

Via Certified Mail # 7011 1150 0000 0283 9239
Return Receipt Requested

Ms. Danielle Taber
Project Manager
Voluntary Remediation Program
Arizona Department of Environmental Quality
1110 W. Washington St.
Phoenix, AZ 85007

Re: Voluntary Remediation Program
Addendum to the Soil and Sediment Characterization Report,
Freeport Sierrita Mine Green Valley, Arizona; AZ VRP Site Code: 100073-03

Dear Ms. Taber:

The enclosed document is an Addendum to the Final Soil and Sediment Characterization report dated December 2012 that was submitted to Arizona Department of Environmental Quality (ADEQ) on January 8, 2012. The Addendum presents the results for radiological constituents in soil and sediment at the Sierrita mine located near Green Valley, Arizona. The data reported here were collected from July 2008 through August 2008 during the site characterization program. The characterization program was conducted under the Arizona Voluntary Remediation Program administered by ADEQ.

Sincerely,

A handwritten signature in blue ink, appearing to read 'K. Katapa'.

Kanyembo Katapa, P.E.
Environmental Engineer
Freeport McMoRan Sierrita Inc

20130816_001

xc: Julie Hoskins, Arizona Department of Environmental Quality
John Patricki, Arizona Department of Environmental Quality
John Broderick, Freeport McMoRan Sierrita Inc
Lana Fretz, Freeport McMoRan Sierrita Inc
Stuart Brown, Freeport McMoRan Copper & Gold
Ned Hall, Freeport McMoRan Copper & Gold

Freeport-McMoRan Sierrita Inc.

VOLUNTARY REMEDIATION PROGRAM (VRP)

ADDENDUM TO THE SOIL AND SEDIMENT CHARACTERIZATION REPORT

Freeport-McMoRan Sierrita Inc.
Green Valley, Arizona

August 14, 2013



A handwritten signature in black ink, appearing to read "Lisa Gerwe".

Lisa Gerwe, P.E.
Staff Civil Engineer

A handwritten signature in blue ink, appearing to read "Loren North".

Loren North, R.G.
Senior Geologist

A handwritten signature in blue ink, appearing to read "Penny Hunter".

Penny Hunter
Principal Scientist/CPM

**VRP Addendum to the Soil and
Sediment Characterization
Report**

Freeport-McMoRan Sierrita, Inc.
Green Valley, Arizona

Prepared for:
Freeport-McMoRan Sierrita, Inc.

Prepared by:
ARCADIS U.S., Inc.
410 North 44th Street
Suite 1000
Phoenix
Arizona 85008
Tel 602 438 0883
Fax 602 438 0102

Our Ref.:
AZ001233

Date:
August 14, 2013

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Acronyms and Abbreviations

ADEQ	Arizona Department of Environmental Quality
ACZ	ACZ Laboratories, Inc.
ALS	ALS Laboratory Group, Inc.
ASTM	American Society for Testing and Materials
bgs	below ground surface
BHHRA	Baseline Human Health Risk Assessment
CLEAR	Copper Leach, Electrowinning and Regeneration
COC	Chain-of-Custody
COI	Constituents of Interest
EDD	Electronic Data Delivery
JS	Judgmental Sample
LDC	Laboratory Data Consultants, Inc.
MDC	Minimum Detectable Concentration
RPDs	Relative Percent Differences
pCi/g	picocuries per gram
QAPP	Quality Assurance Project Plan
Sierrita	Freeport McMoRan Sierrita Inc.
SD	Sediment Sample
SSCR	Soil and Sediment Characterization Report
USEPA	United States Environmental Protection Agency
VRP	Voluntary Remediation Program
Work Plan	VRP Investigation Work Plan

1. Introduction

This addendum presents the site characterization results for radiological constituents in soil and sediment at the Sierrita Mine located near Green Valley, Arizona (Figure 1-1). The investigation was conducted under the Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP). Freeport McMoRan Sierrita Inc. (Sierrita) was formally accepted into the VRP on August 15, 2007. A VRP Investigation Work Plan (Work Plan) was submitted to the ADEQ in April 2008 (URS, 2008a) and an Addendum – Quality Assurance Project Plan (QAPP) was submitted to the ADEQ on November 20, 2008 (URS, 2008b). Implementation of soil and sediment characterization commenced in June 2008 and was completed in November 2008. A soil and sediment characterization report (SSCR) was submitted to the ADEQ in December 2012 (URS, 2012), that presented the results for metal constituents in soil and sediment. This report is an addendum to the SSCR and presents the remaining soil and sediment analytical results for radiological constituents. Per the meeting with Sierrita, ADEQ and ARCADIS on May 16, 2013 agreement was reached that the soil radiological constituents would be reported as an addendum to the SSCR (URS, 2012). Groundwater characterization was also performed between July 2008 and July 2009, and these results will be submitted to the ADEQ in a separate Groundwater Characterization Report.

1.1 Report Objectives and Scope

Soil and sediment characterization activities were conducted between July 2008 and August 2008 from 10 subareas in the Demetrie Wash Area and included the analysis of the following constituents of interest (COI):

- Trace metals: antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, thallium, and zinc, and total uranium
- Radiological Constituents: radium-226 and radium-228, uranium-234, uranium-235, and uranium-238

Trace metals results in soil and sediment were reported in December 2012 SSCR (URS, 2012). At the time of the report submittal, soil and sediment sample results for radiological constituents of interest (COIs) were planned to be included with the Groundwater Characterization Report (URS, 2012). However, it was decided that an addendum to the December 2012 SSCR would facilitate more efficient review and

completion of the characterization activities for the VRP. Therefore, soil and sediment sample results for the radiological COIs are discussed herein as an addendum to the December 2012 SSCR. Tailings solids and pore water material characterization will be reported in the Groundwater Characterization Report.

This report is meant to serve as an addendum to the December 2012 SSCR. Therefore, VRP characterization objectives and activities, data quality objectives information and general Work Plan deviations are not reiterated here as these were already documented (URS, 2012). Work Plan deviations specific to radiological characterization activities are reported.

2. Soil and Sediment Radionuclides Characterization Results

The following subsections present the characterization results for radionuclide COIs in the soil and sediment. Characterization activities are described in detail in URS (2012). These activities were conducted in nine subareas within the Demetrie Wash (Figure 1-2) and the results presented here are grouped by subareas for consistency with the Work Plan. Additionally, averages of the detected activities (non-detects were not considered in the average calculations) as well as ranges are presented. The three general areas and nine subareas that were characterized include:

1. Former Copper Leach, Electrowinning and Regeneration (CLEAR) Plant Area:
 - Former CLEAR Plant
 - Former E Pond
 - Former Evaporation Pond
 - Old D Pond
2. Former Esperanza Mill Area
 - a. Former Esperanza Mill
 - Former C Pond and C Pond Spoils
 - Former Raffinate Pond
 - Former Laydown Yard
3. Tailing Impoundment Area
 - Former Rhenium Ponds

2.1 Soil and Sediment Radiological Sample Analysis

Soil and sediment samples were submitted to ALS Laboratory Group Inc. (ALS) in Fort Collins, Colorado (formerly Paragon Analytics) for analysis of isotopic uranium (uranium-234, uranium-235, and uranium-238) and isotopic radium (radium-226 and radium-228). Isotopic uranium was analyzed by alpha spectroscopy using American Society for Testing and Materials (ASTM) Method D3972. Radium-226 was analyzed using United States Environmental Protection Agency (USEPA) Method 903.1 (radon emanation). Radium-228 was analyzed by gas flow proportional counting (USEPA Method 9320/904.0M) and gamma spectroscopy (USEPA Method 901.1M). Laboratory analytical reports are provided in Appendix A.

2.2 Work Plan Deviations Specific to Radiological Characterization

General and metal COI-specific deviations from the Work Plan were documented in the December 2012 SSCR. Deviations specific to the radiological characterization activities are listed in this report. In general most of the deviations were due to shallower than anticipated bedrock and the borings were subsequently completed shallower than planned. The other deviations are consistent with what typically occurs during a field program. The deviations do not affect attainment of program objectives or the ability to use the data for analysis and interpretation.

Additional judgmental sample locations were added based on field conditions:

1. Old D Pond

OD-JS03 – added to characterize the center of the pond

2. C Pond Spoils

CS-JS04, CS-JS05, and CS-JS06 - locations were added because the initial locations (CS-JS01, CS-JS02, and CS-JS03) were not staked within the actual spoils area

3. Former Laydown Yard – Former Laydown Yard area samples were added following submission of the Work Plan. These locations were added during the VRP investigation to characterize this newly identified subarea:

- EM-JS02
- EM-JS06

- EM-JS07
- EM-JS08.

The following samples did not follow the nomenclature of the subarea they were collected from and reported:

Former C Pond Spoils

- EM-U25 – sample was randomly selected from 200-foot grid and collected from the Former C Pond Spoils, which is located within the Former Esperanza Mill subarea.

A number of borings were completed shallower than the intended depth (22 ft bgs) due to shallower than anticipated bedrock. These deviations are summarized in Table 2-1.

The CS-JS06 1 to 3 foot sample was reported collected (according the field notes) but a sample result was not provided. The entry was crossed out on the chain of custody (COC).

Two instances in which ALS misread a sample identification written on a COC:

- RA-SD01-1.5-3.0, sampled on 8/11/2008, was misread by ALS on the COC; in the electronic data deliverable (EDD), it was listed as "RA-JS01-1.5-3.0." It is reported correctly in this report.
- OD-SD02-1.5-3.0, sampled on 7/28/2008, was misread by ALS on the COC; in the EDD, it was listed as "OD-SD02-1.5-30." It is reported correctly in this report.

The following are instances in which ALS did not analyze a sample for its intended purpose:

- RA-JS02-1-3 was a soil sample collected for analysis and reported in laboratory report 0812258. Additional sample volume from RA-JS02-1-3 was collected for use as a project-specific matrix spike, according to the COC, however the sample was analyzed as a normal sample and reported in the laboratory report 0812207. Based on the circumstances of collection, the RA-JS02-1-3 sample reported in laboratory report 0812207 will be treated as a field duplicate. For clarity, a "(D)" was added to analytical tables and figures in this report to distinguish the original

sample reported in laboratory report 0812258 from the analytical sample reported in 0812207, which is being treated as a field duplicate.

- RA-SD02 -1.5-3.0 – was the parent soil sample collected for analysis and reported on laboratory report 0812207. A duplicate sample, RA-SD02-1.5-3.0 D, was also collected for analysis and reported on laboratory report 0812258. Additional sample volume, labeled as RA-SD02-1.5-3.0 was reported on laboratory report 0812210. This extra volume may have been collected for use as a project-specific matrix spike or matrix spike duplicate (MS/MSD). However, based on review of 812207 and 812210, no MS/MDS completed for this sample. URS confirmed that parent sample was run in 0812207 and duplicate was run in 0812258, and no MS/MSD was run. URS did not specify what to call the sample from laboratory report 0812210. The sample from laboratory report 0812210 is being treated as a second duplicate – “RA-SD02-1.5-3 D2.”

The following samples were collected in the field but were not submitted to ALS for radionuclide analysis. The sample jars were broken during transportation between ACZ and ALS and therefore radionuclide results are not available.

C Pond Spoils

- JS01-0-1

Former C Pond

- JS01-0-1

Former CLEAR Plant

- M04-0-1
- N08-10-12
- SD07-0-1.5
- SD08-1.5- 3
- SD10-0-1.5

Esperanza Mill

- E24-5-7

Former Raffinate Pond

- JS02-5-7 – it is unclear if sample was collected or not; field notes indicated it would be sampled and refusal was at 7 feet bgs.

Old D Pond

- JS02-5 -7

Rhenium Ponds

- JS01-1-3 – field notes indicate a duplicate was collected at this interval; no duplicate noted in the COC for this sample

The following samples were collected in the field but were not submitted to ALS for radiochemistry analysis. The sample jars were broken when the samples were received by ALS and therefore radiochemistry results are not available.

C Pond Spoils –

- JS05-1-3 D – a parent and duplicate sample were noted on COC, sample CS-JS-05-1-3 was received broken, ALS analyzed the duplicate sample as the parent sample

Former C Pond

- JS02-0-1

Former CLEAR Plant

- JS04-15-17
- SD08-0-1.5

Esperanza Mill

- C22-5-7

Old D Pond

- JS03-1-3– This sample was referred to as a duplicate on the COC (without a parent sample), and was received broken, it was not referred to as a duplicate in the field notes, only one sample was submitted for this interval.

Rhenium Ponds

- JS02-0-1

2.3 Subarea Results

Each of the subareas investigated are discussed below. Results are presented in Tables 2-2 to 2-10. Please note that the term reporting limit is used in the discussion, and this is the same as the minimum detectable concentration (MDC) which is used for reporting radionuclide data. MDC and total propagated uncertainty (TPU) are both provided in the data tables. Sample locations and results are presented in Figures 2-1 to 2-15. Results presented on the figures do not include duplicate sample results (if applicable).

The results of the radionuclide analysis of subarea soils indicate the presence of radionuclides consistent with a highly mineralized area. The Sierrita Mine is located on the west margin of the Santa Cruz Basin and along the east flank of the Sierrita Mountains. The principal geologic units include the alluvial deposits, the Basin-Fill Deposits, and the bedrock complex. While alluvial deposits at the mine are limited to natural drainage channels including the various washes at the mine site, there are unconsolidated deposits across the mine site that overlie the bedrock. The soil and sediment was sampled from the unconsolidated deposits. The deposits consist of coarse-grained, unconsolidated silty-sand and gravel ranging in thickness from a few feet up to tens of feet. The unconsolidated material is likely sourced from weathering of the adjacent geologic units, including the Tertiary intrusive formation called the Ruby Star Granodiorite (granodiorite) that comprise the Sierrita Mountains as well as quartz monzonite porphyry. These rocks are composed of minerals that contain naturally-occurring radionuclides, including uranium and thorium. Rock cores were sampled at the site during characterization activities and analyzed for radionuclide activities. These results will be submitted in the Groundwater Characterization Report. Based on results from the characterization activities, uranium occurs in the granodiorite at concentrations up to 19 mg/kg, and in the monzonite at 35 mg/kg. In addition, radium-226 activity in the granodiorite has been measured up to 5.8 picocuries per gram

(pCi/g), and in the monzonite at up to 11 pCi/g. Acid igneous rocks (such as granodiorite) typically contains 3 mg/kg of uranium, and approximately 1 pCi/g of radium (Eisenbud, 1987). The unconsolidated deposits and bedrock complex at the Sierrita Mine therefore contain natural levels of radioactivity at concentrations and activities consistent with a highly mineralized area.

2.4 Former CLEAR Plant Subarea

The following soil and sediment samples were analyzed for radionuclides in the Former CLEAR Plant subarea:

- 25 soil samples from soil borings at 10 grid sample locations
- 14 soil samples from soil borings at 4 judgmental (JS) sample locations
- 16 sediment samples from borings at 9 sediment (SD) sample locations

Refer to Figure 2-1 for the locations of the soil and sediment samples.

According to the December 2012 SSCR, soil borings in the Former CLEAR Plant subarea were advanced to the underlying bedrock which was encountered between 3 and 20 feet bgs. The soils overlying bedrock generally consisted of loose silty sands with gravel sized fill material (URS, 2012).

Sediment samples were collected from each of the four drainages that flow eastward to Demetrie Wash and from one drainage that flows south toward the Old D Pond. Sediment borings were advanced to a maximum depth of 3 feet bgs (URS, 2012).

2.4.1 Soil Radionuclide Results

Radium-226 was not detected above the laboratory reporting limit in two samples, CP-O09-10-12 and CP-Q09-0-1. In total, thirty-nine soil samples were analyzed for radionuclides in the Former CLEAR Plant subarea. Radium-228, uranium-234, and uranium-238 activities were detected above the laboratory reporting limit in each sample collected. Uranium-235 was not detected above the laboratory reporting limit in three samples, P07-5-7, P12-0-1, and CP-JS01-0-1.

Radium-226 was detected at activities in soil ranging from 0.64 to 5.3 pCi/g in the Former CLEAR Plant subarea. The average detected activity of radium-226 in soil was

2.3 pCi/g. Radium-228 was detected at activities in soil ranging from 1.2 to 7.6 pCi/g and the average detected activity was 2.3 pCi/g.

In the Former CLEAR Plant subarea uranium-234 was detected at activities in soil ranging from 0.84 to 12 pCi/g. The average detected activity of uranium-234 in soil was 2.6 pCi/g. Uranium-235 was detected at activities in soil ranging from 0.02 to 0.74 pCi/g and the average detected activity was 0.17 pCi/g. Uranium-238 was detected at activities in soil ranging from 0.84 to 12 pCi/g and the average detected activity was 2.7 pCi/g. Soil radionuclide results from the Former CLEAR Plant subarea are presented in Table 2-2. Radionuclide sample results are shown on Figure 2-2.

2.4.2 Sediment Radionuclide Results

Sixteen sediment samples were collected and analyzed for radionuclides in the Former CLEAR Plant subarea. All analytes were detected above reporting limits with the exception of uranium-235 in CP-SD03-1.5-3.0, CP-SD07-1.5-3, and CP-SD10-1.5-3.0.

Radium-226 was detected at activities in sediment ranging from 0.61 to 3 pCi/g in the Former CLEAR Plant subarea. The average detected activity of radium-226 in sediment was 2.0 pCi/g. Radium-228 was detected at activities in sediment ranging from 1.4 to 2.7 pCi/g and the average detected activity was 2.0 pCi/g.

In the Former CLEAR Plant subarea uranium-234 was detected at activities in sediment ranging from 0.98 to 2.3 pCi/g. The average detected activity of uranium-234 in sediment was 1.7 pCi/g. Uranium-235 was detected at activities in sediment ranging from 0.043 to 0.15 pCi/g and the average detected activity was 0.1 pCi/g. Uranium-238 was detected at activities in sediment ranging from 1.1 to 2.4 pCi/g and the average detected activity was 1.8 pCi/g. Sediment radionuclide results from the Former CLEAR Plant subarea are presented in Table 2-2. Radionuclide sample results are shown on Figure 2-2.

2.4.3 Former CLEAR Plant Subarea Summary

The following areas exhibited highest activities:

- An area in the northern portion of the Former CLEAR Plant subarea, characterized by soil sample locations CP-M04, CP-JS04, and CP-O03. Isotopic radium and uranium activities were generally highest between 5-7 feet bgs or in the case of

CP-O03, where bedrock was encountered at 3 feet bgs, at the deepest soil sample interval, 1-3 feet bgs.

- An area located on the central portion of the subarea, characterized by soil sample locations CP-N08 and CP-JS-02. The highest activities of uranium-234 and 238 were located in the soil sample collected at CP-JS02 from 0-1 feet bgs. However significant lower activities were detected at the deeper samples collected at 1 to 3 feet bgs.

An area located on the eastern portion of the subarea, characterized by soil sample locations CP-JS03 and P07. Soil sample CP-JS03 and P07 contained the highest activities of radium-226 in the subarea at the 5 to 7 feet bgs and 1 to 3 feet bgs sample intervals, respectively.

2.5 Former E-Pond Subarea

The following samples were analyzed for radionuclides in the Former E Pond subarea:

- Five soil samples from borings at 2 JS sample locations

The two soil borings (E-JS01 and E-JS02) were advanced through the footprint of the former impoundment, and according to the December 2012 SSCR, were advanced to the underlying bedrock. Refusal of the direct-push Geoprobe® drilling rig occurred between five and eight feet bgs. As stated in the December 2012 SSCR, the overlying soil above bedrock was shallower to the east of the Former E Pond and overlying soils generally consisted of loose silty sands with layers of cobble-sized fill material (URS, 2012).

2.5.1 Soil Radionuclide Results

Radionuclide COIs were detected at activities above the reporting limits in all samples collected from the Former E Pond area. Radium-226 was detected at activities in soil ranging from 1.3 to 4.8 pCi/g in the Former E-Pond subarea. The average detected activity of radium-226 in soil was 2.3 pCi/g. Radium-228 was detected at activities in soil ranging from 1.4 to 3.5 pCi/g and the average detected activity was 2.4 pCi/g.

In the Former E-Pond subarea uranium-234 was detected at activities in soil ranging from 1.8 to 4.6 pCi/g. The average detected activity of uranium-234 in soil was 2.6 pCi/g. Uranium-235 was detected at activities in soil ranging from 0.072 to 0.31pCi/g

and the average detected activity was 0.14 pCi/g. Uranium-238 was detected at activities in soil ranging from 1.6 to 4.9 pCi/g and the average detected activity was 2.8 pCi/g. Soil radionuclide results from the Former E Pond subarea are presented in Table 2-3. Refer to Figure 2-3 for the locations of the soil samples.

2.5.2 Former E-Pond Subarea Summary

The highest activities from the Former E Pond subarea were observed in the following areas:

- From E-JS01, the highest activities occurred at 1-3 feet bgs for radium-228, however, the highest activities were detected at 5-7 feet bgs for radium-226, uranium-234 and 235. Equal activities of uranium-238 were measured at 1-3 feet bgs and 5-7 feet bgs.
- From E-JS02, the highest activities occurred at 0-1 feet bgs for radium-228 and at 1-3 feet bgs for radium-226, uranium-234, 235, and 238.

2.6 Former Evaporation Pond Subarea

The following samples were analyzed for radionuclides in the Former Evaporation Pond subarea:

- Six soil samples from borings at 2 JS sample locations

The two soil borings advanced in the Former Evaporation Pond subarea were located in the footprint of the former evaporative pond. According to the December 2012 SSCR, the two soil borings were advanced until refusal, which occurred at 8 feet bgs at EV-JS02 and 9 feet bgs at EV-JS01, using the direct-push Geoprobe® drilling rig. As stated in the December 2012 SSCR, overlying soils generally consisted of loose silty sands with layers of cobble-size fill material (URS, 2012).

2.6.1 Soil Radionuclide Results

COIs in samples collected from the Former Evaporation Pond area were detected at activities above the reporting limit. Radium-226 was detected at activities in soil ranging from 0.43 to 5.2 pCi/g in the Former Evaporation Pond subarea. The average detected activity of radium-226 in soil was 2.4 pCi/g. Radium-228 was detected at

activities in soil ranging from 1.5 to 3.8 pCi/g and the average detected activity was 2.3 pCi/g.

In the Former Evaporation Pond subarea uranium-234 was detected at activities in soil ranging from 2 to 6.1 pCi/g. The average detected activity of uranium-234 in soil was 3.2 pCi/g. Uranium-235 was detected at activities in soil ranging from 0.069 to 0.4 pCi/g and the average detected activity was 0.21 pCi/g. Uranium-238 was detected at activities in soil ranging from 2 to 6.6 pCi/g and the average detected activity was 3.4 pCi/g. Soil radionuclide results from the Former Evaporation Pond subarea are presented in Table 2-4. Sample results are provided in Figure 2-4.

2.6.2 Former Evaporation Pond Subarea Summary

The highest activities from the subarea were observed in the following areas:

- Soil sample EV-JS01 generally contained the highest activities of isotopic uranium and radium in the 5-7 feet bgs sample interval for the Former Evaporation Pond subarea. However, highest activity at EV-JS01 occurred at 1-3 feet bgs for radium-226.
- From EV-JS02, the highest activities occurred at 1-3 feet bgs for radium-226 and radium-228 and from 5-7 feet bgs for uranium-234, 235, and 238.

2.7 Old D Pond Subarea

The following soil and sediment samples were analyzed for radionuclides in the Old D Pond for radionuclides:

- Six soil samples from borings at 3 JS sample locations
- 12 SD samples from borings at 6 SD sample locations

The three judgmental soil borings advanced in the Old D Pond subarea were located in the footprint of the former pond. Boring logs in the December 2012 SSCR stated the direct-push Geoprobe® drilling rig that collected soil and sediment samples from the subarea encountered refusal at bedrock at depths ranging from 3 to 9 feet bgs. According to the December 2012 SSCR, based on the three soil borings collected, bedrock appeared to be deeper in the southern edge of the pond. As stated in the

December 2012 SSCR, soils overlying bedrock generally consisted of loose silty sands with layers of cobble-sized fill material (URS, 2012).

Sediment sample from six locations within an unnamed wash were collected. According to the December 2012 SSCR, the wash is located in the drainage area of the Old D pond.

2.7.1 Soil Radionuclide Results

COIs in soil samples collected from the Old D Pond subarea were detected at activities above the reporting limits with the exception of uranium-235 at OD-JS01-0-1, OD-JS02-0-1, and OD-JS02-1-3. Radium-226 was detected at activities in soil ranging from 1.5 to 3.5 pCi/g in the Old D Pond subarea. The average detected activity of radium-226 in soil was 2.7 pCi/g. Radium-228 was detected at activities in soil ranging from 1.2 to 3.5 pCi/g and the average detected activity was 2.2 pCi/g.

In the Old D Pond subarea uranium-234 was detected at activities in soil ranging from 1.8 to 3 pCi/g. The average detected activity of uranium-234 in soil was 2.5 pCi/g. Uranium-235 was detected at activities in soil ranging from 0.12 to 0.17 pCi/g and the average detected activity was 0.15 pCi/g. Uranium-238 was detected at activities in soil ranging from 2 to 3 pCi/g and the average detected activity was 2.6 pCi/g. Refer to Figure 2-5 for the locations of the soil samples. Sample results are provided in Figure 2-6.

2.7.2 Sediment Radionuclide Results

Twelve sediment samples were collected from six locations relative to the Old D Pond, two were northwest, samples OD-SD01 and OD-SD02, one was north, OD-SD03, one was west, OD-SD04, and two were southwest, OD-SD05 and OD-SD06. COI activities were detected above the reporting limit, with the exception of uranium-235. Only two samples collected from the Old D Pond subarea had COI activities above the reporting limit for uranium-235, OD-SD03-0-1.5 and OD-SD05-1.5-3.

Radium-226 was detected at activities in sediment ranging from 0.64 to 2.9 pCi/g in the Old D Pond subarea. The average detected activity of radium-226 in sediment was 2.1 pCi/g. Radium-228 was detected at activities in sediment ranging from 1.6 to 3.2 pCi/g and the average detected activity was 2.5 pCi/g.

In the Old D Pond subarea uranium-234 was detected at activities in sediment ranging from 1.6 to 4.5 pCi/g. The average detected activity of uranium-234 in sediment was 2.8 pCi/g. Uranium-235 was detected at activities in sediment ranging from 0.23 to 0.31 pCi/g and the average detected activity was 0.27 pCi/g. Uranium-238 was detected at activities in sediment ranging from 1.6 to 4.8 pCi/g and the average detected activity was 2.9 pCi/g. Refer to Figure 2-5 for the locations of the sediment samples. Sample results are provided in Figure 2-6.

2.7.3 Old D Pond Subarea Summary

The highest activities from the subarea were observed in the following areas:

- An area located on the north and southeastern discharge areas of the Old D Pond, characterized by sediment sample locations OD-SD-05, OD-SD-06, and OD-SD-03. At OD-SD-03 and OD-SD-06, uranium-234 and 238 activities were greatest in the 1.5-3 feet bgs sample interval, however at OD-SD-05, activities for those analytes were greatest in the surface sample, collected from 0 -1.5 feet bgs. OD-SD-06 contained the highest radium-226 activities, observed at 0-1.5 and 1.5-3 feet bgs.
- An area located within the Old D Pond footprint, characterized by samples OD-JS-01, OD-JS-02, and OD-JS-03. OD-JS02 had the highest activities of radium-226 in the soil sample collected from 0-1 feet bgs and from 1-3 feet bgs. Uranium-234 and 238 were detected at the highest activities in surface samples, 0-1 feet bgs, collected from OD-JS01 and OD-JS03 and from OD-JS02-5-7.

2.8 Former Esperanza Mill Subarea

The following soil and sediment samples were analyzed for radionuclides in the Former Esperanza Mill subarea:

- 24 random grid soil samples from soil borings at 9 locations
- Two soil samples from 1 JS sample locations

Sediment sample depths ranged from 0 to 3 feet bgs and soil sample depths ranged between 0 to 11 feet bgs. According to the December 2012 SSCR, soil samples were collected using a direct-push Geoprobe® drilling rig and encountered refusal at depths of 4-12 feet bgs. As stated in the December 2012 SSCR, bedrock outcroppings are

visible in some areas. Overlaying bedrock materials generally consist of fill or sandy silts to silty sands (URS, 2012). Refer to Figure 2-7 for the locations of the soil samples

2.8.1 Soil Radionuclide Results

Radium-226, uranium-234, and uranium-238 were detected above the laboratory reporting limit in each sample collected. Radium-228 was not detected above the laboratory reporting limit in one sample, X26-1-3. Uranium-235 was not detected above the laboratory reporting limit in the following samples: C22-0-1, E24-0-1, E24-1-3, P24-0-1, P24-5-7, K24-5-7 and H22-1-3.

Radium-226 was detected at activities in soil ranging from 0.54 to 3.5 pCi/g in the Former Esperanza Mill subarea. The average detected activity of radium-226 in soil was 2.0 pCi/g. Radium-228 was detected at activities in soil ranging from 1 to 3 pCi/g and the average detected activity was 2.0 pCi/g.

In the Former Esperanza Mill subarea uranium-234 was detected at activities in soil ranging from 0.85 to 3.3 pCi/g. The average detected activity of uranium-234 in soil was 2.0 pCi/g. Uranium-235 was detected at activities in soil ranging from 0.056 to 0.25 pCi/g and the average detected activity was 0.11 pCi/g. Uranium-238 was detected at activities in soil ranging from 0.9 to 3.4 pCi/g and the average detected activity was 2.0 pCi/g.

Refer to Figure 2-7 for the locations of the soil samples. Sample results are provided in Figure 2-8.

2.8.2 Former Esperanza Mill Subarea Summary

The highest activities generally occurred in the following area:

- An area located within the central portion of the subarea, between the Former Laydown Yard subarea and the Former C Pond subarea, was characterized by samples P24, M26, and EM-JS01. In this area, the deepest soil sample interval collected from each sample location, generally exhibited the highest activity of isotopic radium and uranium.
- Additionally, the activity of radium-226 collected from the X26 in the 0-1 feet bgs sample interval had the highest activity detected in the subarea.

2.9 Former C Pond and C Pond Spoils Subarea

The following soil samples were analyzed for radionuclides in the Former C Pond and C Pond Spoils:

- Three random grid soil samples from a soil boring at 1 grid location
- 32 soil samples from 11 soil borings at JS sample locations

The grid soil samples location, U25, collected from Former C Pond Spoils subarea, originated from the randomly selected node on the 200-foot grid applied to the Former Esperanza Mill subarea. The sample depth intervals ranged between 0 to 5.5 feet bgs.

Three judgmental sample locations were located in the Former C Pond Spoils subarea, five judgmental sample locations were located in the Former C Pond subarea, and three judgmental sample locations were located just outside of the subareas boundaries. Sample depths from judgmental sample locations ranged from 0 to 16 feet bgs.

According to the December 2012 SSCR, the soils overlying bedrock generally consist of loose silty sands to sandy gravel. Refer to Figure 2-9 for the locations of the soil samples (URS, 2012).

2.9.1 Soil Radionuclide Results

Radium-226, uranium-234, and uranium-238 were detected above the laboratory reporting limit in each sample collected. Radium-228 was not detected above the laboratory reporting limit in one sample, C-JS04-0-1. Uranium-235 was not detected above the laboratory reporting limit in two samples, CS-JS01-1-3 and CS-JS02-0-1.

Radium-226 was detected at activities in soil ranging from 0.67 to 5.1 pCi/g in the Former C Pond and C Pond Spoils subarea. The average detected activity of radium-226 in soil was 2.2 pCi/g. Radium-228 was detected at activities in soil ranging from 1.3 to 5.2 pCi/g and the average detected activity was 2.4 pCi/g.

In the Former C Pond and C Pond Spoils subarea, uranium-234 was detected at activities in soil ranging from 1.3 to 6.6 pCi/g. The average detected activity of uranium-234 in soil was 2.3 pCi/g. Uranium-235 was detected at activities in soil ranging from 0.071 to 0.34 pCi/g and the average detected activity was 0.13 pCi/g. Uranium-238

was detected at activities in soil ranging from 1.4 to 6.6 pCi/g and the average detected activity was 2.4 pCi/g. Sample results are provided in Figure 2-10.

2.9.2 Former C Pond Subarea and Former C Pond Spoils Subarea Summary

The highest activities generally occurred in the following areas:

- An area encompassing the northwest portion of the Former C Pond subarea and the northern portion of the Former C Pond Spoils subarea, was characterized by CS-JS01, CS-JS05, and U25. The highest activities in samples collected from the Former C Pond subarea for radium-226 and 228 and uranium-234, 235, and 238 were observed in soil samples collected from U25-5-5.5, and CS-JS05-1-3.
- An area encompassing the central and southern portions of the Former C Pond subarea, was characterized by C-JS02, C-JS03, C-JS04, and C-JS05. Elevated isotopic uranium activities were observed in C-JS02-1-3, C-JS02-5-7, C-JS03-10-12, C-JS03-15-17, and C-JS04-10-12. Isotopic uranium activities generally increased with depth at these soil sample locations, with the exception of C-JS04, where the 15-16 feet bgs soil sample activities were less than the 10-12 feet bgs soil sample activities.

2.10 Former Raffinate Pond Subarea

The following soil and sediment samples were analyzed for radionuclides in the Former Raffinate Pond for radionuclides:

- 13 soil samples (including two duplicates) from soil borings at 5 JS sample locations
- Nine sediment samples (including five duplicates) from soil borings at 2 SD locations

The sample borings were located within the footprint of the Former Raffinate Pond and according to the December 2012 SSCR, were advanced to the top of bedrock using a direct-push Geoprobe® drilling rig, with the exception of RA-JS02 which was collected with a hand auger. As stated in the December 2012 SSCR, the soils overlying bedrock generally consisted of loose silty sands with layers of cobble-sized fill material (URS, 2012). Refer to Figure 2-11 for the locations of the soil and sediment samples.

2.10.1 Soil Radionuclide Results

Radium-226, uranium-234, uranium-235, and uranium-238 were detected above the laboratory reporting limit in each sample collected. Radium-228 was not detected above the laboratory reporting limit in two samples, RA-JS01-0-1 and RA-SD01-0-1.5D. The majority of the samples did not have uranium-235 activities detected above the reporting limit, with the following exceptions: RA-JS01-1-3, RA-JS02-0-1D, RA-JS02-1-3, RA-JS03-0-1, RA-JS05-0-1, RA-SD01-0-1.5D, RA-SD01-1.5-3D, RA-SD02-1.5-3D, RA-SD02-1.5-3D.

Radium-226 was detected at activities in soil ranging from 0.84 to 5.8 pCi/g in the Former Raffinate Pond subarea. The average detected activity of radium-226 in soil was 2.6 pCi/g. Radium-228 was detected at activities in soil ranging from 1.7 to 14 pCi/g and the average detected activity was 3.9 pCi/g.

In the Former Raffinate Pond subarea, uranium-234 was detected at activities in soil ranging from 1.5 to 5.3 pCi/g. The average detected activity of uranium-234 in soil was 2.7 pCi/g. Uranium-235 was detected at activities in soil ranging from 0.092 to 0.21 pCi/g and the average detected activity was 0.17 pCi/g. Uranium-238 was detected at activities in soil ranging from 1.6 to 5.2 pCi/g and the average detected activity was 2.7 pCi/g.

2.10.2 Sediment Radionuclide Results

Radium-226, uranium-234, and uranium-238 were detected above the laboratory reporting limit in each sediment sample collected. Radium-228 was not detected above the laboratory reporting limit in one sample, RA-SD01-0-1.5D. Uranium-235 was not detected above the laboratory reporting limit in RA-SD02-0-1.5D.

Radium-226 was detected at activities in sediment ranging from 1.7 to 3.9 pCi/g in the Former Raffinate Pond subarea. The average detected activity of radium-226 in sediment was 2.5 pCi/g. Radium-228 was detected at activities in sediment ranging from 1.1 to 3.8 pCi/g and the average detected activity was 1.8 pCi/g.

In the Former Raffinate Pond subarea, uranium-234 was detected at activities in sediment ranging from 1 to 4.7 pCi/g. The average detected activity of uranium-234 in sediment was 2.2 pCi/g. Uranium-235 was detected at activities in sediment ranging from 0.061 to 0.15 pCi/g and the average detected activity was 0.10 pCi/g. Uranium-

238 was detected at activities in sediment ranging from 0.92 to 4.3 pCi/g and the average detected activity was 2.2 pCi/g.

2.10.3 Former Raffinate Pond Subarea Summary

The highest soil sample activity of radium-226 was collected at RA-JS03-0-1. The highest radium-228, uranium-234, and uranium-238 soil sample activity occurred at RA-JS02-1-3D, a duplicate of RA-JS02-1-3. The highest soil sample activity for uranium-235, occurred at RA-JS01-1-3.

The highest sediment sample activity for radium-226, radium-228, uranium-234 and uranium-238 collected from the Former Raffinate Pond subarea were collected from RA-SD01-1.5-3.0D. The highest sediment sample activity for uranium-235 occurred at RA-SD01-0-1.5 D. Sample results are provided in Figure 2-12.

2.11 Former Laydown Yard Subarea

The following soil samples were analyzed for radionuclides in the Former Laydown Yard subarea:

- 16 soil samples (including 1 duplicate) from soil borings at four JS sample locations.

According to the December 2012 SSCR, borings were generally advanced to refusal at bedrock, which was located between 3.5 and 15 feet bgs. As stated in the December 2012 SSCR, the top eight feet of fill was characterized as dry, loose, silty sand and below eight feet the fill material was characterized as black stained silty sand possessing a hydrocarbon odor (URS, 2012).

2.11.1 Soil Radionuclide Results

COIs in soil samples were detected at activities above the analytical reporting limit except for uranium-235 at EM-JS08-1-3D.

Radium-226 was detected at activities in sediment ranging from 5 to 1 pCi/g in the Former Laydown Yard subarea. The average detected activity of radium-226 in sediment was 2.5 pCi/g. Radium-228 was detected at activities in sediment ranging from 4.6 to 1.1 pCi/g and the average detected activity was 2.4 pCi/g.

In the Former Laydown Yard subarea, uranium-234 was detected at activities in sediment ranging from 0.93 to 12 pCi/g. The average detected activity of uranium-234 in sediment was 3.9 pCi/g. Uranium-235 was detected at activities in sediment ranging from 0.042 to 0.57 pCi/g and the average detected activity was 0.19 pCi/g. Uranium-238 was detected at activities in sediment ranging from 0.96 to 13 pCi/g and the average detected activity was 4.0 pCi/g. Refer to Figure 2-13 for the locations of the soil samples. Sample results are provided in Figure 2-14.

2.11.2 Former Laydown Yard Subarea Summary

In general, activities were highest in soil samples collected from intervals that were near bedrock and where visually impacted soil was observed. The highest radium-226 activity occurred at EM-JS07-15-16. The highest activity radium-228 activity occurred at EM-JS06-10-11. The highest uranium-234 activities occurred at EM-JS07-15-16 and EM-JS08-10-12. The highest activities for uranium-235 and uranium-238 occurred at EM-JS08-10-12 and EM-JS07-15-16, respectively.

2.12 Former Rhenium Ponds Subarea

The following soil samples were analyzed for radionuclides in the Former Rhenium Pond subarea for radionuclides:

- 10 soil samples (including one duplicate) from soil borings at two JS locations

Both judgmental sample locations were within the footprint of the Former Rhenium Ponds. According to the December 2012 SSCR, soil borings were advanced to a depth of 20 feet bgs and bedrock was not encountered at either boring location. As stated in the December 2012 SSCR, the upper material generally consisted of silt with sand to silty sand and the deeper materials consisted of well sorted, gray silt with sand (URS, 2012).

2.12.1 Soil Radionuclide Results

Target radionuclide analytes were detected above the reporting limit with the exception of uranium-235 at RP-JS01-5-7, RP-JS01-0-1, RP-JS01-1-3, RP-JS02-5-7, RP-JS02-10-12, and RP-JS02-15-17. The highest radium-226 soil sample activity occurred at RP-JS01-10-12 and RP-JS02-15-17.

Radium-226 was detected at activities in sediment ranging from 0.71 to 2.8 pCi/g in the Former Rhenium Pond subarea. The average detected activity of radium-226 in sediment was 2.2 pCi/g. Radium-228 was detected at activities in sediment ranging from 0.82 to 1.9 pCi/g and the average detected activity was 1.6 pCi/g.

In the Former Rhenium Pond subarea, uranium-234 was detected at activities in sediment ranging from 0.7 to 3.1 pCi/g. The average detected activity of uranium-234 in sediment was 1.5 pCi/g. Uranium-235 was detected at activities in sediment ranging from 0.046 to 0.1 pCi/g and the average detected activity was 0.06 pCi/g. Uranium-238 was detected at activities in sediment ranging from 0.8 to 3.2 pCi/g and the average detected activity was 1.5 pCi/g. Refer to Figure 2-15 for the locations and sample results from the soil samples

2.12.2 Former Rhenium Pond Subarea Summary

In general, activities in the Former Rhenium Pond subarea were moderate. The highest activities were observed in the 10-12 and 15-17 feet bgs sample intervals.

3. Quality Assurance/ Quality Control

3.1 Analytical Data Packages

The analytical laboratory reports for the soil and sediment samples analyzed for radionuclides are provided in Appendix A. Data tables were prepared using EDDs provided by ALS in a spreadsheet format. However, while populating the EDDs in the spreadsheet format, in some cases, the analytical data results did not retain the correct significant figures. For instance, results that contained trailing zeroes did not have those trailing zeroes included in the reported data. Results are reported using the values in the EDDs.

3.2 Data Verification

Analytical results for soil and sediment samples analyzed for radionuclides were verified in accordance with the methods and procedures identified in Section 5.2 of the QAPP (URS, 2008b). Deviations from the Work Plan have been documented in URS (2012), and in Section 2.6 for radiological-specific samples. The laboratory reports and field notes were reviewed by URS to ensure accuracy and to explain any inconsistencies that were identified between the Work Plan and analytical results. This data verification summary is included in Appendix B.

To determine ultimate usability of the data, laboratory reports from both the radionuclides and metals investigation were submitted to Laboratory Data Consultants, Inc. (LDC) for review and the addition of data qualifiers used to qualify the analytical results associated with quality control parameters outside of the established data quality objectives. The data qualifiers added by LDC are defined below:

- J The analyte was positively identified; however, the result should be considered an estimated value.
- UJ The analyte was not positively identified. The reporting limit is considered an estimated value.
- U The analyte was not positively identified above the Minimum Detectable Concentration (MDC)

Tables 2-2 through 2-10 contain the data qualifiers added by LDC to the radionuclide soil and sediment analytical results. Appendix C contains the data qualifiers added by LDC to the total metals soil and sediment analytical results.

Based on the results of the verification of the radionuclide soil and sediment data, LDC adjusted the MDC for several of the analytes which indicated that results should be reported as not detected. Samples that were determined to be not detected contain a “U” validation data qualifier.

3.3 Data Validation

According to the QAPP, a third party EPA Level IV data validation was required for ten percent of the data packages. Two data packages of radionuclide data were sent to LDC for EPA Level IV data validation to satisfy this requirement including one data package, ALS report 0812177, which contained soil and sediment radionuclide results. The LDC EPA Level IV data validation report is included in Appendix D. The other radionuclide package for solids was for rock core results and will be discussed in the groundwater characterization report.

3.4 Field Duplicate Sample Evaluation

Field duplicates are generally collected during the field investigation to assess how conditions in the field affect the precision of sample analytical results and provide information about heterogeneity of a particular sample location. Soil and sediment field duplicates were collected in succession from the same sample source and device

and the original sample and the field duplicate were not homogenized, according to the QAPP (URS, 2008b).

A total of nine soil and sediment duplicates were collected and analyzed during the investigation program. Although the number of duplicates collected is less than the 38 duplicates specified in the Work Plan, far fewer primary samples were collected than originally intended due to shallow bedrock depths. The nine duplicates were collected to represent 182 primary soil and sediment samples. Therefore, one duplicate was collected for approximately every 20 samples (one duplicate per every 20.2 primary samples). This satisfies the Work Plan requirement of one duplicate sample collected and analyzed for every 20 primary samples of a given matrix.

The relative percent differences (RPDs) between the field duplicate and its associated sample were calculated and are presented in Table 3-1. The RPD is a measure of precision calculated by the following formula:

$$RPD = |X_1 - X_2| / X_{avg}$$

Where:

X_1 and X_2 are the observed activity values

X_{avg} is the average activity, and

$|X_1 - X_2|$ is the absolute value of the difference between observed values

Field duplicate evaluation procedures for soil and sediment samples were not specified in the Work Plan or QAPP/Sampling and Analysis Plan addendum (URS 2008a, URS 2008b). For consistency, the same criteria used in the SSCR were used to evaluate soil and sediment samples analyzed for radionuclides. The field duplicates and parent samples were evaluated by the following criteria:

- If both analytes were detected at an activity greater than or equal to five times the MDC, the RPD should be less than 50 percent.

- If one or both analytes were detected at an activity that is less than five times the MDC, then the difference between the sample and the field duplicate should not exceed the four times the MDC.
- Duplicate RPDs are calculated by dividing the difference of the activities by the average of the activities.

Field duplicate RPDs were within acceptance limits with the following exceptions:

- Radium-226 values for RP-JS02-1-3 and its field duplicate RP-JS02-1-3D were both not above five times the MDC and the absolute difference between the values was greater than four times the MDC; therefore, data were qualified “J” to indicate a potential bias.
- Radium-226 values for RA-JS02-1-3 and its field duplicate RA-JS02-1-3D were below five times the MDC and the absolute difference between the values was greater than four times the MDC; therefore, data were qualified “J” to indicate a potential bias.

3.5 Performance Evaluation Samples

The Work Plan (URS, 2008a) suggested that the submission of performance evaluation samples may be required if there were unexpected or unexplained sample results, or if continued quality issues were detected through the data verification/validation process. None of these issues were identified during the sampling effort; therefore, no performance samples were submitted to the laboratory for evaluation.

4. Results Evaluation

The results of the soil and sediment characterization will be further evaluated in a baseline human health risk assessment (BHHRA), including comparison to appropriate screening levels and background levels.

5. References

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URS Corporation. 2008b. Addendum to Sampling & Analyses Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoRan Sierrita Green Valley, Arizona. Prepared for Freeport-McMoRan Sierrita Inc. September.

URS Corporation. 2012. Final Voluntary Remediation Program (VRP) Soil and Sediment Characterization Report, Freeport-McMoRan Sierrita Inc., Green Valley, Arizona. December.

**Table 2-1 Summary of Sample Depth Deviations
Sierrita Mine**

Sample ID	Refusal Depth ft bgs	Comments
Former C Pond		
C-JS01	3	
C-JS02	7	
C-JS03	17	
C-JS04	16	noted water flowing in boring
C-JS05	5	
C Pond Spoils		
CS-JS01	14	
CS-JS02	11	
CS-JS03	15	
CS-JS04	7	
CS-JS05	4	
CS-JS06	3	
U25	5.5	
Former CLEAR Plant		
CP-JS01	12	
CP-JS02	4	
CP-JS03	7	
CP-JS04	20	
M04	5.5	
M06	4	
N08	11	
O03	3	
O09	17.5	
P04	3	
P05	3.5	
P07	12	
P12	6	
Q09	3	
Former E Pond		
E-JS01	8	
E-JS02	5	
Former Laydown Yard		
EM-JS02	4	
EM-JS06	11	
EM-JS07	16	
EM-JS08	12	stopped drilling at 12 ft bgs, refusal was not noted
Former Esperanza Mill		
EM-JS01	4	
C22	7	
E24	7	
G27	4	
H22	7	
K24	9	
M26	9	
N29	4	
P24	11	
X26	8	
Former Evaporation Pond		
EV-JS01	7	
EV-JS02	6	
Former Raffinate Pond		
RA-JS01	8	
RA-JS02	7	
RA-JS03	4	
RA-JS04	2.5	
RA-JS05	3	
Old D Pond		
OD-JS01	4	
OD-JS02	9	
OD-JS03	1	
Rhenium Ponds		
RP-JS01	20	stopped drilling at 20 ft bgs, refusal was not noted
RP-JS02	20	stopped drilling at 20 ft bgs, refusal was not noted

Notes:

ft bgs - feet below ground surface

Table 2-2 Former CLEAR Plant Soil and Sediment Radionuclide Results
Former CLEAR Plant
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
CP-JS01-0-1	0	1		7/15/2008	0.64	0.59	0.44	4.2	2.7	1.9	1.3	0.034	0.27	0.039 U	0.055	0.039	1.3	0.034	0.28
CP-JS01-1-3	1	3		7/15/2008	2	0.37	0.54	2.1 J	0.98	0.64	2.4	0.073	0.47	0.19	0.053	0.084	2.7	0.06	0.52
CP-JS01-5-7	5	7		7/15/2008	2.8	0.6	0.49	1.7 J	0.77	0.57	2	0.043	0.39	0.2	0.034	0.079	2.1	0.029	0.4
CP-JS01-10-12	10	12		7/15/2008	2.4	0.33	0.71	2.5	0.96	0.68	2.8	0.047	0.52	0.11	0.047	0.059	3	0.058	0.55
CP-JS02-0-1	0	1		7/11/2008	2.9	0.46	0.8	1.9 J	1.6	0.85	12	0.017	2	0.74	0.046	0.19	12	0.017	2
CP-JS02-1-3	1	3		7/11/2008	1.1 J	0.42	0.28	1.5 J	1.1	0.63	0.84	0.034	0.19	0.081	0.033	0.048	1	0.028	0.22
CP-JS03-0-1	0	1		7/14/2008	2.5	0.38	0.66	2.3	0.87	0.61	2.6	0.036	0.49	0.11	0.048	0.059	2.7	0.036	0.5
CP-JS03-1-3	1	3		7/14/2008	2.1	0.35	0.6	2.3 J	0.89	0.64	2.3	0.027	0.42	0.072	0.032	0.044	2.2	0.033	0.42
CP-JS03-5-7	5	7		7/14/2008	5.3	0.35	1.2	2 J	0.74	0.52	3.6	0.03	0.65	0.2	0.042	0.081	3.6	0.036	0.64
CP-JS04-0-1	0	1		8/27/2008	2.6	0.38	0.69	2.3	0.99	0.62	3	0.051	0.55	0.081	0.076	0.059	2.6	0.058	0.48
CP-JS04-1-3	1	3		8/27/2008	2.4	0.51	0.41	1.7	1.1	0.53	2.3	0.073	0.45	0.14	0.086	0.083	2.2	0.052	0.45
CP-JS04-5-7	5	7		8/27/2008	5 J	0.62	0.75	2.4 J	1.1	0.67	6.4	0.087	1.1	0.27	0.085	0.11	6.3	0.11	1.1
CP-JS04-10-12	10	12		8/27/2008	0.88 J	0.52	0.43	1.8 J	0.66	0.57	2.9	0.11	0.52	0.19	0.052	0.078	3.1	0.077	0.55
CP-JS04-20	20	20		8/27/2008	2.3 J	0.48	0.41	1.5 J	0.77	0.53	2.4	0.054	0.44	0.13	0.063	0.068	2.3	0.071	0.43
CP-SD01-0-1.5	0	1.5		7/16/2008	2.1	0.41	0.61	1.5	0.96	0.5	1.5	0.031	0.32	0.11	0.036	0.058	1.5	0.016	0.31
CP-SD01-1.5-3	1.5	3		7/16/2008	2.2	0.42	0.39	2.4	0.78	0.57	2.2	0.03	0.42	0.14	0.042	0.067	2.2	0.03	0.42
CP-SD10-1.5-3	1.5	3		7/28/2008	0.61	0.58	0.4	2.2 J	0.93	0.66	1.2	0.079	0.27	0.054 U	0.06	0.045	1.4	0.063	0.3
CP-SD02-0-1.5	0	1.5		7/16/2008	1.5	0.54	0.34	1.4 J	1	0.58	1.9	0.014	0.37	0.092	0.033	0.051	1.8	0.028	0.36
CP-SD02-1.5-3	1.5	3		7/16/2008	1.5	0.35	0.47	1.5	0.95	0.66	1.2	0.046	0.27	0.043	0.023	0.039	1.2	0.046	0.27
CP-SD03-0-1.5	0	1.5		7/16/2008	2.8	0.094	0.79	1.5 J	1	0.61	0.98	0.049	0.23	0.075	0.053	0.051	1.1	0.04	0.25
CP-SD03-1.5-3	1.5	3		7/16/2008	2.3	0.45	0.42	1.8 J	0.78	0.59	1.8	0.13	0.42	0.097 U	0.097	0.08	1.9	0.031	0.42
CP-SD04-0-1.5	0	1.5		7/17/2008	0.77	0.065	0.31	2.7	1.6	0.81	1.9	0.059	0.42	0.097	0.069	0.075	2.1	0.041	0.46
CP-SD04-1.5-3	1.5	3		7/17/2008	1.4	0.46	0.49	2.3 J	1.5	0.84	1.4	0.031	0.29	0.11	0.036	0.058	1.3	0.031	0.27
CP-SD05-0-1.5	0	1.5		7/16/2008	2.7	0.54	0.46	2	1	0.56	2.1	0.05	0.4	0.15	0.035	0.068	2	0.04	0.39
CP-SD05-1.5-3	1.5	3		7/16/2008	2.3	0.06	0.61	2.1	0.96	0.62	2.3	0.1	0.49	0.098	0.038	0.076	1.9	0.11	0.44
CP-SD06-0-1.5	0	1.5		7/16/2008	2.7	0.49	0.44	2.1	0.91	0.59	1.7	0.037	0.34	0.095	0.039	0.052	1.9	0.028	0.37
CP-SD06-1.5-3	1.5	3		7/16/2008	3	0.51	0.49	2.6	0.92	0.65	1.7	0.034	0.34	0.11	0.034	0.056	1.9	0.029	0.36
CP-SD07-1.5-3	1.5	3		7/23/2008	2.1	0.45	0.38	2.5	0.83	0.6	2	0.034	0.39	0.12 U	0.12	0.067	2.2	0.051	0.44
CP-SD09-0-1.5	0	1.5		7/28/2008	3	0.26	0.76	2	1	0.59	2.1	0.041	0.4	0.098	0.043	0.055	2.4	0.03	0.46
CP-SD09-1.5-3	1.5	3		7/28/2008	1.6	0.42	0.55	1.4	0.79	0.45	1.7	0.051	0.34	0.072	0.035	0.046	1.7	0.041	0.34
M04-1-2.5	1	2.5		7/11/2008	2.3	0.56	0.42	1.5 J	1.1	0.6	1.9	0.067	0.37	0.069	0.049	0.047	1.8	0.055	0.35
M04-5-5.4	5	5.4		7/11/2008	4	0.57	0.61	2.5 J	1.1	0.72	3.8	0.034	0.68	0.2	0.017	0.079	3.8	0.034	0.68
M06-0-1	0	1		7/11/2008	1.3 J	0.47	0.29	1.2 J	0.9	0.45	1.1	0.065	0.24	0.063	0.056	0.046	1.1	0.047	0.23
M06-1-3	1	3		7/11/2008	1	0.52	0.28	1.6 J	1.2	0.64	0.88	0.034	0.2	0.056	0.034	0.04	1	0.034	0.22
N08-0-1	0	1		7/11/2008	1.5	0.42	0.31	1.6	0.72	0.47	1.5	0.043	0.32	0.089	0.037	0.053	1.8	0.047	0.36
N08-1-3	1	3		7/11/2008	4.1	0.47	0.94	3 J	0.96	0.8	3.9	0.05	0.7	0.2	0.036	0.082	4	0.042	0.71
N08-5-7	5	7		7/11/2008	2.3	0.35	0.59	2.4 J	1.2	0.78	4	0.058	0.72	0.18	0.038	0.079	4.3	0.044	0.78
O03-0-1	0	1		7/11/2008	2.1	0.44	0.38	2	0.9	0.52	2.5	0.072	0.49	0.14	0.043	0.069	2.7	0.075	0.52
O03-1-3	1	3		7/11/2008	3.3	0.5	0.52	2.4	0.83	0.61	3.1	0.072	0.56	0.23	0.044	0.085	3.1	0.053	0.56
O09-0-1	0	1		7/11/2008	1.4	0.29	0.42	7.6 J	3.4	2.9	2.7	0.054	0.51	0.21	0.038	0.086	2.8	0.043	0.53
O09-1-3	1	3		7/11/2008	1.2	0.44	0.44	2.1	1	0.64	2	0.051	0.4	0.17 J	0.019	0.075	2	0.057	0.4
O09-5-7	5	7		7/11/2008	1.7	0.42	0.54	2.2 J	1.4	0.77	1.9	0.066	0.38	0.16	0.044	0.074	1.9	0.016	0.37
O09-10-12	10	12		7/11/2008	0.4 U	0.43	0.3	1.9 J	1.1	0.67	1.8	0.05	0.37	0.1	0.019	0.057	1.9	0.042	0.38
O09-15-17	15	17		7/11/2008	1.4	0.51	0.6	2.1 J	1.1	0.74	2.6	0.058	0.5	0.13	0.02	0.065	2.6	0.039	0.49
P04-0-1	0	1		7/15/2008	1.9	0.47	0.58	2.5 J	0.88	0.7	2.5	0.016	0.48	0.17	0.019	0.075	2.5	0.047	0.47
P04-1-3	1	3		7/15/2008	1.8	0.44	0.35	2.1	0.91	0.57	2.3	0.055	0.45	0.19	0.049	0.084	1.9	0.062	0.39
P05-0-1	0	1		7/15/2008	1.2	0.28	0.38	2.5	0.94	0.63	2.9	0.038	0.54	0.27	0.045	0.1	3	0.032	0.57
P05-1-3	1	3		7/15/2008	2.2	0.41	0.39	1.9	0.72	0.52	2.5	0.045	0.47	0.22	0.036	0.085	2.6	0.041	0.48
P07-0-1	0	1		7/17/2008	2.8	0.3	0.69	2.8 J	0.9	0.69	2.2	0.11	0.49	0.21	0.04	0.12	2.9	0.079	0.62
P07-1-3	1	3		7/17/2008	4.8	0.71	1.2	2.8 J	1.3	0.78	2.4	0.1	0.52	0.19	0.04	0.11	2.6	0.089	0.56
P07-5-7	5	7		7/17/2008	1.3	0.33	0.44	3.5	2.8	1.8	1.9	0.1	0.36	0.074 U	0.098	0.068	1.8	0.11	0.35
P12-0-1	0	1		7/23/2008	1.5	0.055	0.43	1.6 J	1.1	0.62	1.6	0.083	0.39	0.19 U	0.19	0.11	1.7	0.061	0.39
P12-1-3	1	3		7/23/2008	1.9	0.58	0.65	1.9 J	1	0.67	0.91	0.049	0.21	0.041	0.019	0.034	0.84	0.055	0.2
Q09-0-1	0	1		7/23/2008	0.64 U	0.82	0.54	2 J	1.2	0.66	1.7	0.095	0.4	0.14	0.099	0.09	1.5	0.12	0.37
Q09-1-3	1	3		7/23/2008	1.9	0.44	0.35	1.8 J	0.69	0.54	1.2	0.036	0.26	0.02	0.018	0.025	1.2	0.036	0.25

Notes:
ft bgs - feet below ground surface
pCi/g = picocuries per gram
MDC = Minimum Detectable Concentration
TPU = Total Propagated Uncertainty
U = indicates the isotope was analyzed for but not detected at or above the stated limit.
J = indicates an estimated value

Table 2-3 Former E Pond Soil Radionuclide Results
Former E Pond
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
E-JS01-0-1	0	1		7/14/2008	1.3 J	0.24	0.44	1.4	0.88	0.5	1.8	0.06	0.35	0.097	0.051	0.055	1.6	0.058	0.33
E-JS01-1-3	1	3		7/14/2008	1.6	0.5	0.54	3.5	2.5	1.7	2.1	0.088	0.43	0.092	0.074	0.062	2.5	0.044	0.48
E-JS01-5-7	5	7		7/14/2008	2	0.41	0.61	2.2 J	1.2	0.66	2.3	0.09	0.47	0.072	0.063	0.055	2.5	0.048	0.51
E-JS02-0-1	0	1		7/14/2008	1.8	0.063	0.52	2.7	1	0.71	2.2	0.029	0.41	0.12	0.018	0.061	2.3	0.015	0.44
E-JS02-1-3	1	3		7/14/2008	4.8	0.42	1.1	2	1	0.63	4.6	0.046	0.83	0.31	0.019	0.1	4.9	0.037	0.87

Notes:

ft bgs - feet below ground surface

pCi/g = picocuries per gram

MDC = Minimum Detectable Concentration

TPU = Total Propagated Uncertainty

J = indicates an estimated value

Table 2-4 Former Evaporation Pond Soil Radionuclide Results
Former Evaporation Pond
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
EV-JS01-0-1	0	1		7/14/2008	0.44	0.17	0.23	1.9 J	0.88	0.59	3.8	0.051	0.68	0.27	0.019	0.098	4	0.051	0.72
EV-JS01-1-3	1	3		7/14/2008	3	0.33	0.85	3.8	2.5	1.7	2.4	0.048	0.46	0.13	0.035	0.063	2.6	0.04	0.48
EV-JS01-5-7	5	7		7/14/2008	5.2	0.64	0.76	2.5	1	0.69	6.1	0.031	1.1	0.4	0.036	0.16	6.6	0.071	1.2
EV-JS02-0-1	0	1		7/14/2008	0.43	0.35	0.3	1.5 J	0.84	0.56	2	0.037	0.39	0.15	0.044	0.07	2	0.046	0.4
EV-JS02-1-3	1	3		7/14/2008	2.5	0.47	0.43	1.6	0.77	0.51	2.7	0.047	0.51	0.21	0.041	0.087	2.6	0.042	0.5
EV-JS02-5-7	5	7		7/14/2008	2.6 J	0.59	0.48	1.9 J	0.95	0.58	2	0.016	0.39	0.069	0.038	0.047	2.3	0.032	0.45

Notes:

ft bgs - feet below ground surface

pCi/g = picocuries per gram

MDC = Minimum Detectable Concentration

TPU = Total Propagated Uncertainty

J = indicates an estimated value

Table 2-5 Old D Pond Soil and Sediment Radionuclide Results
Old D Pond
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
OD-JS01-0-1	0	1		7/29/2008	3.1	0.41	0.91	1.8 J	0.99	0.66	2.8	0.033	0.52	0.11 U	0.11	0.057	2.9	0.014	0.52
OD-JS01-1-3	1	3		7/29/2008	1.5	0.37	0.46	2.1 J	1.1	0.71	2.3	0.05	0.47	0.17	0.049	0.084	2	0.062	0.42
OD-JS02-0-1	0	1		7/29/2008	3.5	0.79	1.1	1.2 J	0.67	0.46	1.8	0.015	0.36	0.052 U	0.052	0.038	2.1	0.015	0.4
OD-JS02-1-3	1	3		7/29/2008	3.3	0.22	0.79	2.6	1	0.69	2.5	0.036	0.47	0.079 U	0.079	0.049	2.4	0.016	0.46
OD-JS02-5-7	5	7		7/29/2008	2.2	0.42	0.6	3.5 J	1.3	0.84	2.7 J	0.026	0.57	0.12 J	0.083	0.084	3 J	0.1	0.63
OD-JS03-0-1	0	1		8/27/2008	2.3	0.52	0.42	1.7	1.1	0.54	3	0.037	0.53	0.16	0.044	0.072	3	0.053	0.54
OD-SD01-0-1.5	0	1.5		7/28/2008	2	0.4	0.59	2.6	1.1	0.68	1.9	0.029	0.37	0.099 U	0.099	0.055	2.2	0.035	0.42
OD-SD01-1.5-3	1.5	3		7/28/2008	1.6	0.31	0.5	1.8	1	0.57	1.8	0.039	0.35	0.091 U	0.091	0.051	1.9	0.029	0.38
OD-SD02-0-1.5	0	1.5		7/28/2008	1.9	0.58	0.61	2.7	0.85	0.62	1.7	0.16	0.35	0.06 U	0.08	0.058	1.9	0.1	0.38
OD-SD02-1.5-3	1.5	3		7/28/2008	2.5	0.69	0.83	2.3	0.79	0.56	1.7	0.05	0.34	0.11 U	0.11	0.059	1.8	0.042	0.36
OD-SD03-0-1.5	0	1.5		7/28/2008	2.9	0.25	0.7	3	0.88	0.65	3.7	0.11	0.72	0.31	0.097	0.14	4	0.12	0.77
OD-SD03-1.5-3	1.5	3		7/28/2008	2.2	0.49	0.42	2	1.1	0.59	4.5	0.038	0.8	0.23 U	0.23	0.089	4.8	0.042	0.85
OD-SD04-0-1.5	0	1.5		7/28/2008	2.6	0.39	0.66	2.1	1.1	0.63	2.5	0.05	0.49	0.18 U	0.18	0.079	2.6	0.05	0.49
OD-SD04-1.5-3	1.5	3		7/28/2008	2.6	0.22	0.63	1.6 J	0.81	0.56	1.6	0.054	0.34	0.1 U	0.1	0.059	1.6	0.066	0.34
OD-SD05-0-1.5	0	1.5		7/29/2008	2.1	0.39	0.68	2.9	1	0.72	3.9	0.054	0.7	0.18 U	0.18	0.079	3.7	0.061	0.67
OD-SD05-1.5-3	1.5	3		7/29/2008	1.5	0.77	0.68	3.2 J	1.2	0.77	3.1	0.049	0.6	0.23	0.043	0.096	3	0.019	0.59
OD-SD06-0-1.5	0	1.5		7/29/2008	0.64	0.18	0.29	3.2 J	0.96	0.77	2.7	0.039	0.5	0.18 U	0.18	0.075	3.1	0.015	0.56
OD-SD06-1.5-3	1.5	3		7/29/2008	2.6	0.54	0.45	2	0.88	0.57	4.4	0.016	0.79	0.23 U	0.23	0.088	4.5	0.037	0.8

Notes:

ft bgs - feet below ground surface

pCi/g = picocuries per gram

MDC = Minimum Detectable Concentration

TPU = Total Propagated Uncertainty

U = indicates the isotope was analyzed for but not detected at or above the stated limit.

J = indicates an estimated value

Table 2-6 Former Esperanza Mill Soil Radionuclide Results
Former Esperanza Mill
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
EM-JS01-0-1	0	1		8/1/2008	2.7 J	0.55	0.48	1.8 J	1.2	0.6	1.6	0.079	0.32	0.079	0.047	0.05	1.7	0.058	0.35
EM-JS01-1-3	1	3		8/1/2008	1.6 J	0.32	0.5	2.8 J	1.2	0.84	2.9	0.053	0.55	0.11	0.042	0.058	2.9	0.044	0.54
C22-0-1	0	1		7/29/2008	2.4	0.2	0.61	1.4	1.1	0.52	2.2	0.045	0.42	0.11 U	0.11	0.059	1.9	0.052	0.37
C22-1-3	1	3		7/29/2008	1.6	0.76	0.73	2.4 J	1	0.66	2.3	0.052	0.48	0.12	0.061	0.073	2.4	0.064	0.5
E24-0-1	0	1		7/29/2008	0.54	0.2	0.25	1.7	1.2	0.6	1.8	0.053	0.35	0.086 U	0.086	0.052	1.7	0.037	0.35
E24-1-3	1	3		7/29/2008	2.1	0.47	0.68	1.3 J	1	0.56	1.9	0.057	0.41	0.11 U	0.11	0.074	1.8	0.065	0.41
G27-0-1	0	1		8/7/2008	2.1	0.87	0.83	2.3 J	0.95	0.77	2.8	0.052	0.54	0.18	0.052	0.078	2.7	0.052	0.51
G27-1-3	1	3		8/7/2008	2	0.56	0.69	2.2 J	1.6	0.9	1.6	0.043	0.32	0.074	0.045	0.049	1.7	0.016	0.34
H22-0-1	0	1		7/30/2008	1.8 J	0.53	0.38	2 J	0.9	0.6	1.9	0.045	0.37	0.096	0.049	0.056	1.9	0.037	0.39
H22-1-3	1	3		7/30/2008	1.6	0.42	0.55	1 J	0.82	0.63	1.5	0.062	0.31	0.055 U	0.055	0.044	1.3	0.05	0.28
H22-5-7	5	7		7/31/2008	2.4	0.43	0.41	1.3 J	0.89	0.54	2.7	0.051	0.51	0.13	0.018	0.064	2.6	0.036	0.49
K24-0-1	0	1		7/31/2008	1.8	0.47	0.35	1.7 J	0.84	0.57	1.7	0.052	0.34	0.12	0.052	0.063	1.7	0.039	0.34
K24-1-3	1	3		7/31/2008	2	0.45	0.37	2 J	0.74	0.57	1.4	0.041	0.29	0.081	0.018	0.049	1.3	0.052	0.28
K24-5-7	5	7		7/31/2008	2.2	0.41	0.39	2.3	0.7	0.59	1.7	0.046	0.35	0.049 U	0.049	0.041	1.6	0.037	0.32
M26-0-1	0	1		8/1/2008	2.5	0.43	0.68	2.2 J	1.1	0.83	1.7	0.054	0.35	0.11	0.058	0.064	1.7	0.054	0.36
M26-1-3	1	3		8/1/2008	1.6	0.35	0.5	1.7 J	0.96	0.56	2.4	0.045	0.46	0.13	0.036	0.063	2.5	0.045	0.48
M26-5-7	5	7		8/1/2008	2.7 J	0.58	0.49	2.9 J	1	0.79	2.7	0.029	0.51	0.25	0.034	0.09	2.9	0.035	0.54
N29-0-1	0	1		8/6/2008	0.79	0.32	0.34	1.5	1	0.48	1.4	0.084	0.29	0.056	0.05	0.043	1.4	0.061	0.29
N29-1-3	1	3		8/6/2008	2	0.29	0.58	1.7 J	1.4	0.75	1.2	0.048	0.27	0.078	0.038	0.05	1.3	0.039	0.28
P24-0-1	0	1		8/7/2008	2.4	0.53	0.42	1.9	0.97	0.56	2.2	0.03	0.43	0.078 U	0.078	0.048	2.1	0.036	0.41
P24-1-3	1	3		8/7/2008	1.8	0.2	0.55	2.1	0.87	0.6	3.3	0.043	0.57	0.14	0.04	0.066	3.4	0.036	0.6
P24-5-7	5	7		8/7/2008	2.6	0.23	0.73	2	0.87	0.58	2.1	0.042	0.41	0.12 U	0.12	0.059	2.2	0.015	0.42
P24-10-11	10	11		8/7/2008	2.8	0.41	0.75	3 J	1	0.78	2	0.048	0.38	0.12	0.062	0.064	2.2	0.053	0.41
X26-0-1	0	1		8/6/2008	3.5	0.37	0.91	1.8 J	0.94	0.67	1.7	0.046	0.33	0.063	0.05	0.044	1.8	0.049	0.35
X26-1-3	1	3		8/6/2008	0.72	0.63	0.47	2 U	2.5	1.4	0.85	0.061	0.2	0.059	0.052	0.044	0.9	0.041	0.21
X26-5-7	5	7		8/6/2008	1.1	0.072	0.38	2.2	1.1	0.69	2.1	0.11	0.49	0.084	0.083	0.072	2.2	0.087	0.5

Notes:

ft bgs - feet below ground surface

pCi/g = picocuries per gram

MDC = Minimum Detectable Concentration

TPU = Total Propagated Uncertainty

U = indicates the isotope was analyzed for but not detected at or above the stated limit.

J = indicates an estimated value

Table 2-7 Former C Pond and C Pond Spoils Soil Radionuclide Results
Former C Pond and C Pond Spoils
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
Former C Pond																			
C-JS01-0-1	0	1		8/1/2008	1.5	0.48	0.53	2.1 J	1.1	0.77	1.6	0.032	0.32	0.092	0.019	0.053	1.5	0.016	0.31
C-JS01-1-3	1	3		8/1/2008	2.1	0.29	0.62	2.2 J	1.1	0.69	1.8	0.03	0.36	0.11	0.018	0.058	1.7	0.03	0.34
C-JS02-1-3	1	3		8/1/2008	2.3 J	0.42	0.41	1.8 J	0.94	0.56	2.6	0.036	0.49	0.088	0.018	0.051	2.6	0.03	0.5
C-JS02-5-7	5	7		8/1/2008	4	0.46	0.98	5.2 J	1.3	1.2	3.3	0.029	0.62	0.2	0.047	0.082	4	0.035	0.72
C-JS03-0-1	0	1		8/4/2008	1.9	0.39	0.61	1.8 J	1.2	0.8	1.9	0.045	0.38	0.12	0.018	0.059	1.9	0.036	0.38
C-JS03-1-3	1	3		8/4/2008	0.91	0.073	0.35	1.9 J	1.1	0.69	1.9	0.046	0.37	0.14	0.041	0.066	2	0.034	0.39
C-JS03-5-7	5	7		8/4/2008	2.6	0.29	0.65	2.1 J	1.1	0.66	1.9	0.029	0.38	0.1	0.018	0.055	2.1	0.015	0.41
C-JS03-10-12	10	12		8/4/2008	2.2 J	0.7	0.45	2.7 J	0.99	0.74	3.6	0.032	0.67	0.21	0.019	0.084	3.5	0.032	0.66
C-JS03-15-17	15	17		8/4/2008	2 J	0.55	0.41	2.5 J	1	0.67	3.7	0.037	0.68	0.16	0.019	0.071	4.2	0.031	0.77
C-JS04-0-1	0	1		8/5/2008	0.82	0.18	0.33	2.4 U	2.6	1.5	1.6	0.045	0.33	0.071	0.043	0.047	1.5	0.041	0.31
C-JS04-1-3	1	3		8/5/2008	2.6	0.53	0.85	2.6	1	0.73	1.9	0.056	0.38	0.19	0.061	0.084	2.1	0.064	0.42
C-JS04-5-7	5	7		8/5/2008	1.4	0.55	0.62	2.4	0.73	0.64	1.5	0.038	0.3	0.092	0.033	0.051	1.6	0.028	0.32
C-JS04-10-12	10	12		8/5/2008	3.1	0.86	1	2.3 J	1.2	0.77	3	0.034	0.55	0.15	0.033	0.067	3.1	0.038	0.56
C-JS04-15-16	15	16		8/5/2008	1.5	0.46	0.32	1.3 J	0.84	0.53	2.1	0.037	0.41	0.087	0.036	0.051	1.9	0.031	0.37
C-JS05-1-3	1	3		8/5/2008	5 J	0.34	1.1	4.6	2.7	2	2.2	0.055	0.44	0.085 J	0.038	0.052	2.1	0.048	0.42
C Pond Spoils																			
CS-JS01-1-3	1	3		8/4/2008	1.8 J	0.28	0.53	2 J	1.5	0.79	2.2	0.031	0.43	0.042 U	0.049	0.038	2	0.037	0.39
CS-JS01-5-7	5	7		8/4/2008	3.6	0.45	0.92	3.4 J	1.1	0.91	2.1	0.049	0.43	0.14	0.053	0.071	2.1	0.04	0.41
CS-JS01-10-12	10	12		8/4/2008	1.9	0.61	0.64	2.7 J	0.98	0.77	2.2	0.042	0.42	0.087	0.034	0.05	2.4	0.039	0.46
CS-JS02-0-1	0	1		8/4/2008	2.2	0.33	0.62	2.2 J	0.94	0.74	1.6	0.042	0.32	0.056 U	0.062	0.046	1.8	0.037	0.37
CS-JS02-1-3	1	3		8/4/2008	1.9	0.39	0.6	1.9	0.73	0.53	2.4	0.066	0.45	0.11	0.054	0.059	2.5	0.056	0.47
CS-JS02-5-7	5	7		8/4/2008	1.7	0.61	0.38	2.1 J	0.77	0.63	1.6	0.039	0.34	0.098	0.046	0.058	1.9	0.049	0.38
CS-JS02-10-11	10	11		8/4/2008	3.7	0.33	0.93	2.2	0.94	0.64	2.5	0.015	0.48	0.093	0.018	0.052	2.7	0.03	0.51
CS-JS03-0-1	0	1		8/5/2008	2.3	0.45	0.65	2	1	0.64	1.5	0.042	0.31	0.077	0.049	0.05	1.8	0.031	0.37
CS-JS03-1-3	1	3		8/5/2008	0.92	0.76	0.54	1.7 J	1	0.62	1.5	0.098	0.35	0.12	0.083	0.081	1.5	0.063	0.36
CS-JS03-5-7	5	7		8/5/2008	1.9	0.67	0.69	1.9	1.4	0.67	1.3	0.016	0.27	0.071	0.043	0.047	1.4	0.037	0.29
CS-JS03-10-12	10	12		8/5/2008	2.7 J	0.51	0.46	2.6	0.99	0.66	1.7	0.037	0.35	0.11	0.043	0.058	1.8	0.046	0.36
CS-JS04-0-1	0	1		8/6/2008	0.89	0.75	0.55	2.6	0.82	0.65	1.8	0.027	0.35	0.14	0.016	0.063	1.8	0.027	0.35
CS-JS04-1-3	1	3		8/6/2008	1.7	0.5	0.56	2.4 J	0.81	0.71	1.7	0.027	0.34	0.096	0.032	0.051	1.8	0.033	0.35
CS-JS04-5-7	5	7		8/6/2008	1.5	0.31	0.51	2	1.2	0.62	1.4	0.091	0.35	0.088	0.087	0.075	1.8	0.032	0.41
CS-JS05-0-1	0	1		8/27/2008	2.1	0.44	0.37	2.4 J	0.69	0.64	3.3	0.042	0.62	0.19	0.044	0.08	3.3	0.016	0.62
CS-JS05-1-3	1	3		8/27/2008	4.6	0.5	1.2	2.6 J	0.91	0.61	6.6	0.032	1.2	0.34	0.02	0.11	6.6	0.044	1.2
CS-JS06-0-1	0	1		8/27/2008	1.7	0.39	0.33	1.5 J	0.65	0.44	1.5	0.046	0.31	0.096	0.019	0.054	1.6	0.046	0.33
U25-0-1	0	1		8/6/2008	0.67 J	0.3	0.31	2 J	0.92	0.7	2.1	0.046	0.4	0.13	0.019	0.062	2.2	0.037	0.42
U25-1-3	1	3		8/6/2008	1.6	0.38	0.52	2.1 J	1.1	0.69	1.7	0.072	0.35	0.11	0.045	0.065	1.8	0.052	0.37
U25-5-5.5	5	5.5		8/6/2008	5.1	0.63	0.74	3.5	1.3	0.78	5.4	0.07	1	0.26	0.051	0.11	6.1	0.052	1.1

Notes:

ft bgs - feet below ground surface

pCi/g = picocuries per gram

MDC = Minimum Detectable Concentration

TPU = Total Propagated Uncertainty

U = indicates the isotope was analyzed for but not detected at or above the stated limit.

J = indicates an estimated value

Table 2-8 Former Raffinate Pond Soil and Sediment Radionuclide Results
Former Raffinate Pond
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
RA-JS01-0-1	0	1		8/7/2008	1.4	0.66	0.61	2.5 U	2.7	1.5	1.6	0.044	0.32	0.087 U	0.087	0.052	1.6	0.053	0.32
RA-JS01-1-3	1	3		8/7/2008	2.1	0.2	0.61	1.9 J	1.4	0.84	2.9	0.025	0.56	0.21	0.086	0.11	3.2	0.073	0.62
RA-JS01-5-7	5	7		8/7/2008	0.9	0.24	0.39	1.7 J	1.2	0.64	3.3	0.059	0.59	0.16 U	0.16	0.071	3.4	0.039	0.61
RA-JS02-0-1	0	1		8/11/2008	3.4 J	0.85	0.62	2 J	1.5	0.75	2	0.051	0.4	0.082 U	0.082	0.053	2.1	0.034	0.43
RA-JS02-0-1D	0	1	Duplicate	8/11/2008	3.2 J	0.67	0.59	2.6 J	1.3	0.8	1.9	0.043	0.4	0.16	0.057	0.078	2	0.043	0.4
RA-JS02-1-3	1	3		8/11/2008	1.5 J	0.35	0.55	8.9	2.7	3.1	3.8	0.048	0.7	0.19	0.051	0.081	3.8	0.063	0.7
RA-JS02-1-3D	1	3	Duplicate	8/11/2008	3.4 J	0.79	0.63	14 J	1.6	2.2	5.3	0.054	0.96	0.17 U	0.17	0.082	5.2	0.019	0.93
RA-JS03-0-1	0	1		8/7/2008	5.8	0.82	1.5	2.9 J	1.4	0.88	1.8	0.029	0.32	0.092	0.0092	0.038	1.8	0.0078	0.31
RA-JS03-1-3	1	3		8/7/2008	0.84	0.43	0.36	2.2 J	1.1	0.73	1.8	0.035	0.35	0.1 U	0.1	0.056	1.9	0.03	0.38
RA-JS04-0-1	0	1		8/7/2008	2.7	0.56	0.47	2.4	0.97	0.64	1.5	0.041	0.3	0.079 U	0.079	0.049	1.6	0.03	0.32
RA-JS04-1-2.5	1	2.5		8/7/2008	2.7	0.46	0.8	2.6	0.87	0.67	2	0.039	0.39	0.083 U	0.083	0.049	2	0.039	0.39
RA-JS05-0-1	0	1		8/7/2008	1.8	0.49	0.65	2.6 J	1.5	0.83	3.7	0.015	0.63	0.2	0.052	0.082	3.5	0.036	0.6
RA-JS05-1-3	1	3		8/7/2008	3.8	0.44	0.95	3.1	1.5	0.84	3.7	0.027	0.66	0.12 U	0.12	0.056	3.5	0.027	0.62
RA-SD01-0-1.5	0	1.5		8/11/2008	3 J	0.47	0.49	1.6 J	0.91	0.6	2.3	0.047	0.44	0.091 U	0.091	0.052	2.3	0.036	0.44
RA-SD01-0-1.5D	0	1.5	Duplicate	8/11/2008	1.7	0.2	0.46	2.1 U	2.3	1.3	2.4	0.062	0.47	0.15	0.02	0.07	2.6	0.033	0.5
RA-SD01-1.5-3	1.5	3		8/11/2008	3.1 J	0.54	0.52	2.4 J	1.2	0.65	4.2	0.05	0.75	0.2 U	0.2	0.083	3.9	0.047	0.71
RA-SD01-1.5-3D	1.5	3	Duplicate	8/11/2008	3.9 J	0.71	0.67	3.8 J	1.3	1	4.7	0.053	0.85	0.13	0.039	0.066	4.3	0.04	0.78
RA-SD02-0-1.5	0	1.5		8/11/2008	2.5 J	0.59	0.47	1.6 J	1	0.65	1	0.043	0.22	0.052 U	0.052	0.038	0.92	0.035	0.21
RA-SD02-0-1.5D	0	1.5	Duplicate	8/11/2008	2.2 J	0.48	0.42	1.3 J	0.67	0.5	1	0.017	0.24	0.024 U	0.056	0.032	1	0.048	0.23
RA-SD02-1.5-3	1.5	3		8/11/2008	2 J	0.65	0.44	1.1 J	1.1	0.6	1.3	0.058	0.28	0.06 U	0.06	0.043	1.2	0.042	0.25
RA-SD02-1.5-3D	1.5	3	Duplicate	8/11/2008	2.3 J	0.56	0.45	1.3 J	1.3	0.68	1.5	0.044	0.32	0.065	0.049	0.048	1.8	0.047	0.37
RA-SD02-1.5-3D2	1.5	3	Duplicate	8/11/2008	2.2 J	0.51	0.42	1.6 J	1.1	0.59	1.8	0.05	0.36	0.061	0.037	0.044	1.8	0.043	0.36

Notes:

ft bgs - feet below ground surface

pCi/g = picocuries per gram

MDC = Minimum Detectable Concentration

TPU = Total Propagated Uncertainty

U = indicates the isotope was analyzed for but not detected at or above the stated limit.

J = indicates an estimated value

Table 2-9 Former Laydown Yard Soil Radionuclide Results
Former Laydown Yard
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
EM-JS02-0-1	0	1		8/1/2008	3	0.31	0.74	3.7 J	1.5	0.96	2.1	0.043	0.41	0.13	0.034	0.062	2.5	0.043	0.47
EM-JS02-1-3	1	3		8/1/2008	3	0.44	0.81	4	2.3	1.7	4.5	0.046	0.82	0.2	0.021	0.085	4.4	0.058	0.81
EM-JS06-0-1	0	1		8/13/2008	2.9	0.53	0.49	2.1 J	0.86	0.63	1.9	0.031	0.39	0.094	0.036	0.054	1.9	0.037	0.38
EM-JS06-1-3	1	3		8/13/2008	1.3 J	0.28	0.4	1.5	0.8	0.49	5.5	0.015	0.96	0.23	0.018	0.086	5.5	0.035	0.96
EM-JS06-5-7	5	7		8/13/2008	1.8 J	0.44	0.54	1.9 J	0.93	0.67	2.4	0.039	0.47	0.086	0.019	0.052	2	0.017	0.41
EM-JS06-10-11	10	11		8/13/2008	1.4 J	0.21	0.38	4.6 J	1.4	1.2	4.4	0.016	0.79	0.19	0.049	0.079	5	0.037	0.89
EM-JS07-0-1	0	1		8/13/2008	4.6	0.29	1.1	1.9	0.92	0.58	2.8	0.065	0.51	0.19	0.064	0.084	2.5	0.054	0.47
EM-JS07-1-3	1	3		8/13/2008	2 J	0.25	0.59	1.6 J	0.99	0.62	3.2	0.016	0.59	0.16	0.037	0.073	3.7	0.031	0.67
EM-JS07-5-7	5	7		8/13/2008	2.3 J	0.36	0.6	2.1 J	1.2	0.78	2.8	0.038	0.52	0.14	0.037	0.068	2.7	0.032	0.51
EM-JS07-10-12	10	12		8/13/2008	1.4 J	0.4	0.49	1.8 J	0.99	0.66	3.6	0.045	0.68	0.12	0.052	0.068	3.3	0.037	0.64
EM-JS07-15-16	15	16		8/13/2008	5 J	0.61	0.77	4.2 J	1.1	0.93	12	0.056	2.1	0.47	0.023	0.15	13	0.019	2.2
EM-JS08-0-1	0	1		8/12/2008	1.9	0.43	0.61	1.6 J	0.87	0.63	1.2	0.034	0.25	0.055	0.049	0.042	1.2	0.072	0.25
EM-JS08-1-3	1	3		8/12/2008	2.9 J	0.52	0.49	1.1 J	0.71	0.6	0.93	0.026	0.18	0.042	0.031	0.029	0.97	0.021	0.19
EM-JS08-1-3D	1	3	Duplicate	8/12/2008	2.5 J	0.59	0.47	1.9 J	1.1	0.67	1	0.053	0.22	0.063 U	0.075	0.053	0.96	0.038	0.21
EM-JS08-5-7	5	7		8/12/2008	1 J	0.34	0.41	2.5 J	1.1	0.76	2.8	0.069	0.54	0.22	0.051	0.094	2.8	0.058	0.54
EM-JS08-10-12	10	12		8/12/2008	3.4 J	0.27	0.86	1.8 J	0.96	0.75	12	0.095	2.1	0.57	0.068	0.17	12	0.044	2.1

Notes:

ft bgs - feet below ground surface

pCi/g = picocuries per gram

MDC = Minimum Detectable Concentration

TPU = Total Propagated Uncertainty

U = indicates the isotope was analyzed for but not detected at or above the stated limit.

J = indicates an estimated value

Table 2-10 Former Rhenium Ponds Soil Radionuclide Results
Former Rhenium Ponds
Sierrita Mine

Sample ID	Depth (ft bgs)		Duplicate	Date	Radium-226 (pCi/g)			Radium-228 (pCi/g)			Uranium-234 (pCi/g)			Uranium-235 (pCi/g)			Uranium-238 (pCi/g)		
	Top	Bottom			Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU	Result	MDC	TPU
RP-JS01-0-1	0	1		8/12/2008	1.9	0.49	0.65	1.4 J	1.1	0.53	1.3	0.043	0.28	0.18 U	0.18	0.077	1.2	0.032	0.26
RP-JS01-1-3	1	3		8/12/2008	2.6 J	0.55	0.47	1.6 J	1.2	0.64	1.4	0.041	0.29	0.084 U	0.084	0.051	1.2	0.016	0.26
RP-JS01-5-7	5	7		8/12/2008	1.6	0.32	0.54	0.82 J	0.77	0.4	0.7	0.063	0.19	0.042 U	0.06	0.044	0.8	0.057	0.21
RP-JS01-10-12	10	12		8/12/2008	2.8 J	0.69	0.53	1.9 J	1.3	0.77	1.2	0.016	0.21	0.057	0.0081	0.027	1.2	0.0069	0.21
RP-JS01-15-17	15	17		8/12/2008	2.5 J	0.51	0.45	1.9 J	1	0.67	2	0.018	0.35	0.1	0.029	0.041	2.1	0.025	0.35
RP-JS02-1-3	1	3		8/12/2008	2.6 J	0.43	0.79	1.7 J	1	0.74	1	0.033	0.19	0.046	0.0096	0.027	0.94	0.03	0.18
RP-JS02-1-3D	1	3	Duplicate	8/12/2008	0.71 J	0.51	0.4	1.8 J	1.6	0.87	1	0.025	0.19	0.051	0.021	0.028	0.98	0.018	0.18
RP-JS02-5-7	5	7		8/12/2008	1.5	0.65	0.69	1.5 J	1.2	0.71	1.3	0.084	0.27	0.075 U	0.075	0.049	1.4	0.06	0.28
RP-JS02-10-12	10	12		8/12/2008	2.5 J	0.49	0.45	1.6 J	1.2	0.66	3.1	0.054	0.56	0.11 U	0.11	0.058	3.2	0.044	0.59
RP-JS02-15-17	15	17		8/12/2008	2.8 J	0.71	0.52	1.5 J	1.2	0.71	2	0.049	0.4	0.1 U	0.1	0.058	1.9	0.049	0.38

Notes:

ft bgs - feet below ground surface

pCi/g = picocuries per gram

MDC = Minimum Detectable Concentration

TPU = Total Propagated Uncertainty

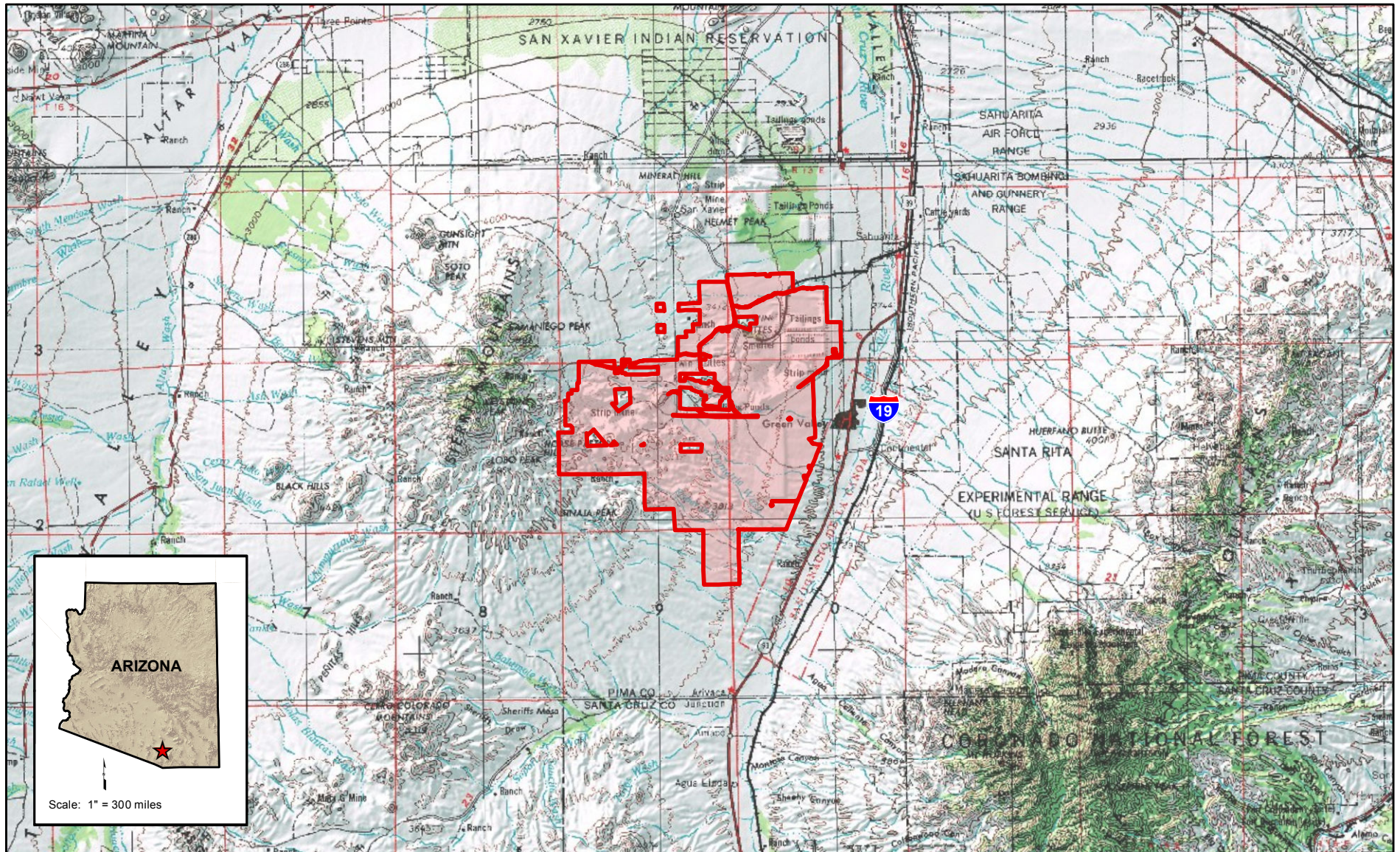
U = indicates the isotope was analyzed for but not detected at or above the stated limit.

J = indicates an estimated value


**Table 3-1
Field Duplicate Summary
Sierrita Mine**

Sample ID / Field Duplicate ID	Sample Date	Depth (ft bgs)		Parameters	Sample Result	Field Duplicate Result	Sample MDC	Field Duplicate MDC	5 x Sample MDC	5 x Field Duplicate MDC	AD	RPD (%)	Qualification
		Top	Bottom										
EM-JS08-1-3 / EM-JS08-1-3D	8/12/2008	1	3	Radionuclides (pCi/g)									
				Radium-226	2.9 J	2.5 J	0.52	0.59	2.60	2.95	0.4	NC	
				Radium-228	1.1 J	1.9 J	0.71	1.1	3.55	5.50	0.8	NC	
				Uranium-234	0.93	1	0.026	0.053	0.13	0.27	NC	7.3%	
				Uranium-235	0.042	0.063 U	0.031	0.075	0.155	0.38	0.021	NC	
				Uranium-238	0.97	0.96	0.021	0.038	0.11	0.19	NC	1.0%	
				Radium-226	2.6	0.71 J	0.43	0.51	2.15	2.55	1.89	NC	J
				Radium-228	1.7 J	1.8 J	1	1.6	5.00	8.00	0.1	NC	
				Uranium-234	1	1	0.033	0.025	0.17	0.13	NC	0.0%	
				Uranium-235	0.046	0.051	0.0096	0.021	0.048	0.105	0.005	NC	
				Uranium-238	0.94	0.98	0.03	0.018	0.15	0.09	NC	4.2%	
				Radium-226	3.4 J	3.2 J	0.85	0.67	4.25	3.35	0.2	NC	
				Radium-228	2 J	2.6 J	1.5	1.3	7.50	6.50	0.6	NC	
				Uranium-234	2	1.9	0.051	0.043	0.26	0.22	NC	5.1%	
				Uranium-235	0.082 U	0.16	0.082	0.057	0.41	0.29	0.078	NC	
				Uranium-238	2.1	2	0.034	0.043	0.17	0.22	NC	4.9%	
				Radium-226	1.5	3.4 J	0.35	0.79	1.75	3.95	1.9	NC	J
				Radium-228	8.9	14 J	2.7	1.6	13.50	8.00	5.1	NC	
				Uranium-234	3.8	5.3	0.048	0.054	0.24	0.27	NC	33.0%	
				Uranium-235	0.19	0.17 U	0.051	0.17	0.26	0.85	0.02	NC	
				Uranium-238	3.8	5.2	0.063	0.019	0.32	0.10	NC	31.1%	
				Radium-226	3 J	1.7	0.47	0.20	2.35	1.00	NC	43.3%	
				Radium-228	1.6 J	2.1 U	0.91	2.3	4.55	11.50	0.5	NC	
				Uranium-234	2.3	2.4	0.047	0.062	0.24	0.31	NC	4.3%	
				Uranium-235	0.091 U	0.15	0.091	0.02	0.46	0.10	0.059	NC	
				Uranium-238	2.3	2.6	0.036	0.033	0.18	0.17	NC	12.2%	
				Radium-226	3.1 J	3.9 J	0.54	0.71	2.70	3.55	NC	22.9%	
				Radium-228	2.4 J	3.8 J	1.2	1.3	6.00	6.50	1.4	NC	
				Uranium-234	4.2	4.7	0.05	0.053	0.25	0.27	NC	11.2%	
				Uranium-235	0.2 U	0.13	0.2	0.039	1.00	0.20	0.07	NC	
				Uranium-238	3.9	4.3	0.047	0.04	0.24	0.20	NC	9.8%	
				Radium-226	2.5 J	2.2 J	0.59	0.48	2.95	2.40	0.3	NC	
				Radium-228	1.6 J	1.3 J	1	0.67	5.00	3.35	0.3	NC	
				Uranium-234	1	1	0.043	0.017	0.22	0.09	NC	0.0%	
				Uranium-235	0.052 U	0.024 U	0.052	0.056	0.26	0.28	0.028	NC	
				Uranium-238	0.92	1	0.035	0.048	0.18	0.24	NC	8.3%	
				Radium-226	2 J	2.3 J	0.65	0.56	3.25	2.80	0.3	NC	
				Radium-228	1.1 J	1.3 J	1.1	1.3	5.50	6.50	0.2	NC	
				Uranium-234	1.3	1.5	0.058	0.044	0.29	0.22	NC	14.3%	
				Uranium-235	0.06 U	0.065	0.06	0.049	0.30	0.25	0.005	NC	
				Uranium-238	1.2	1.8	0.042	0.047	0.21	0.24	NC	40.0%	
				Radium-226	2 J	2.2 J	0.65	0.51	3.25	2.55	0.2	NC	
				Radium-228	1.1 J	1.6 J	1.1	1.1	5.50	5.50	0.5	NC	
				Uranium-234	1.3	1.8	0.058	0.05	0.29	0.25	NC	32.3%	
				Uranium-235	0.06 U	0.061	0.06	0.037	0.30	0.19	0.001	NC	
				Uranium-238	1.2	1.8	0.042	0.043	0.21	0.22	NC	40.0%	

Notes:
ft bgs = feet below ground surface
MDC = Minimum Detectable Concentration
AD = Absolute Difference
RPD = Relative Percent Difference: [(difference)/(average)]*100
pCi/g = picocuries per gram
J = Indicates an estimated value
NC = Not calculated; RPD values were not calculated for non-detects or trace values
U = The analyte was not positively identified above the MDC

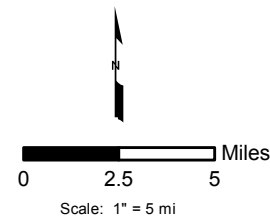


LEGEND

 Approximate property boundary

NOTES

· Topographic map source:
ESRI USA Topo Maps.

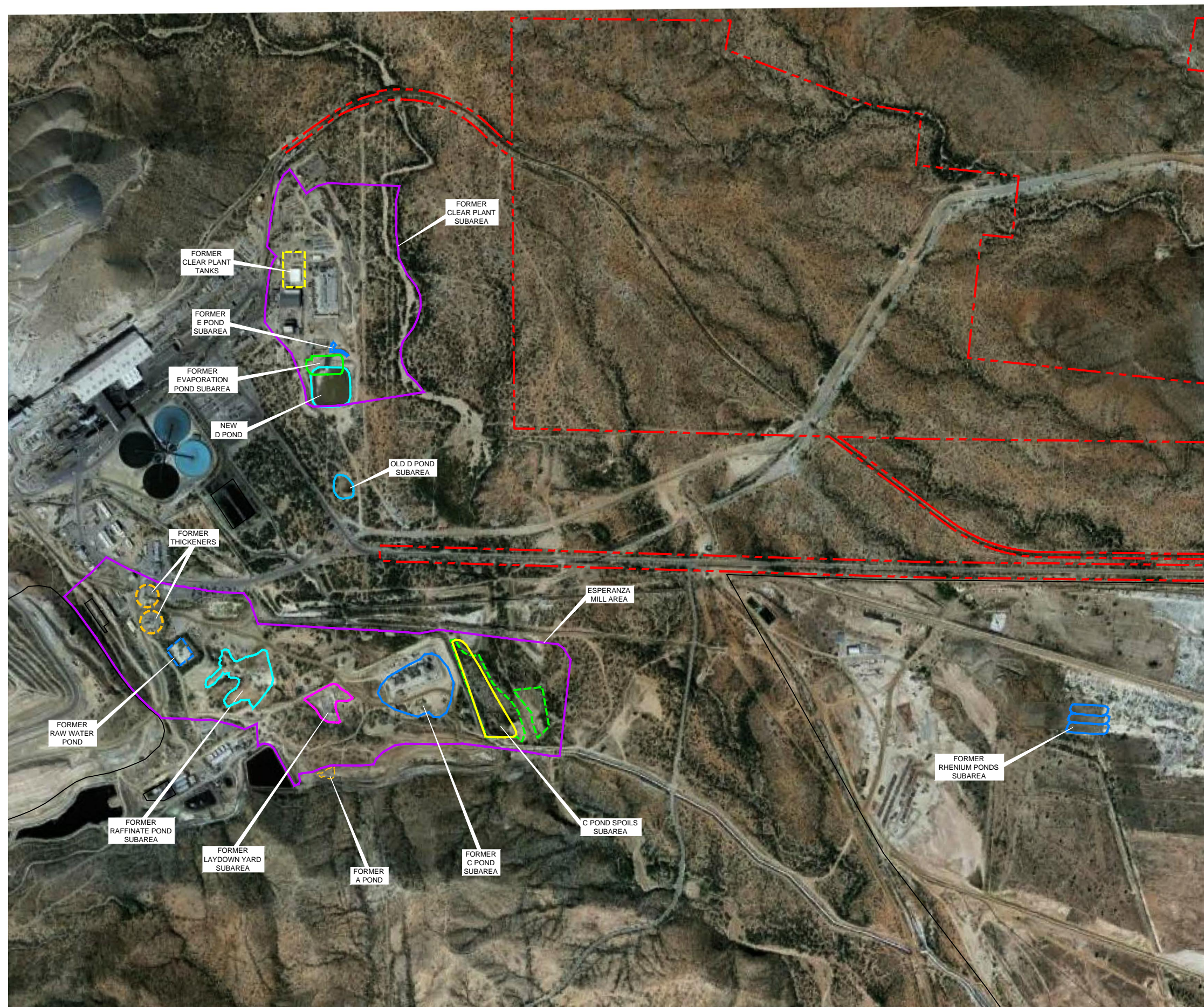


FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

SITE LOCATION MAP



FIGURE
1-1

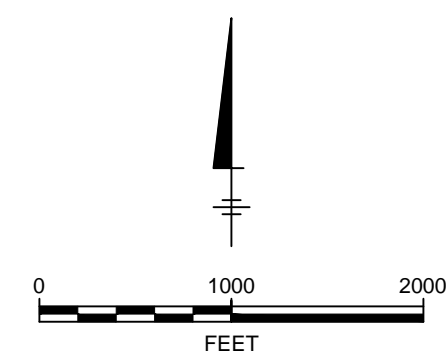


LEGEND

 PROPERTY BOUNDARY

SOURCE:

IMAGERY: GOOGLE™ EARTH, IMAGE DATE 10/8/2012



FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

SUBAREAS LOCATION MAP



FIGURE
1-2

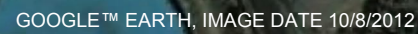
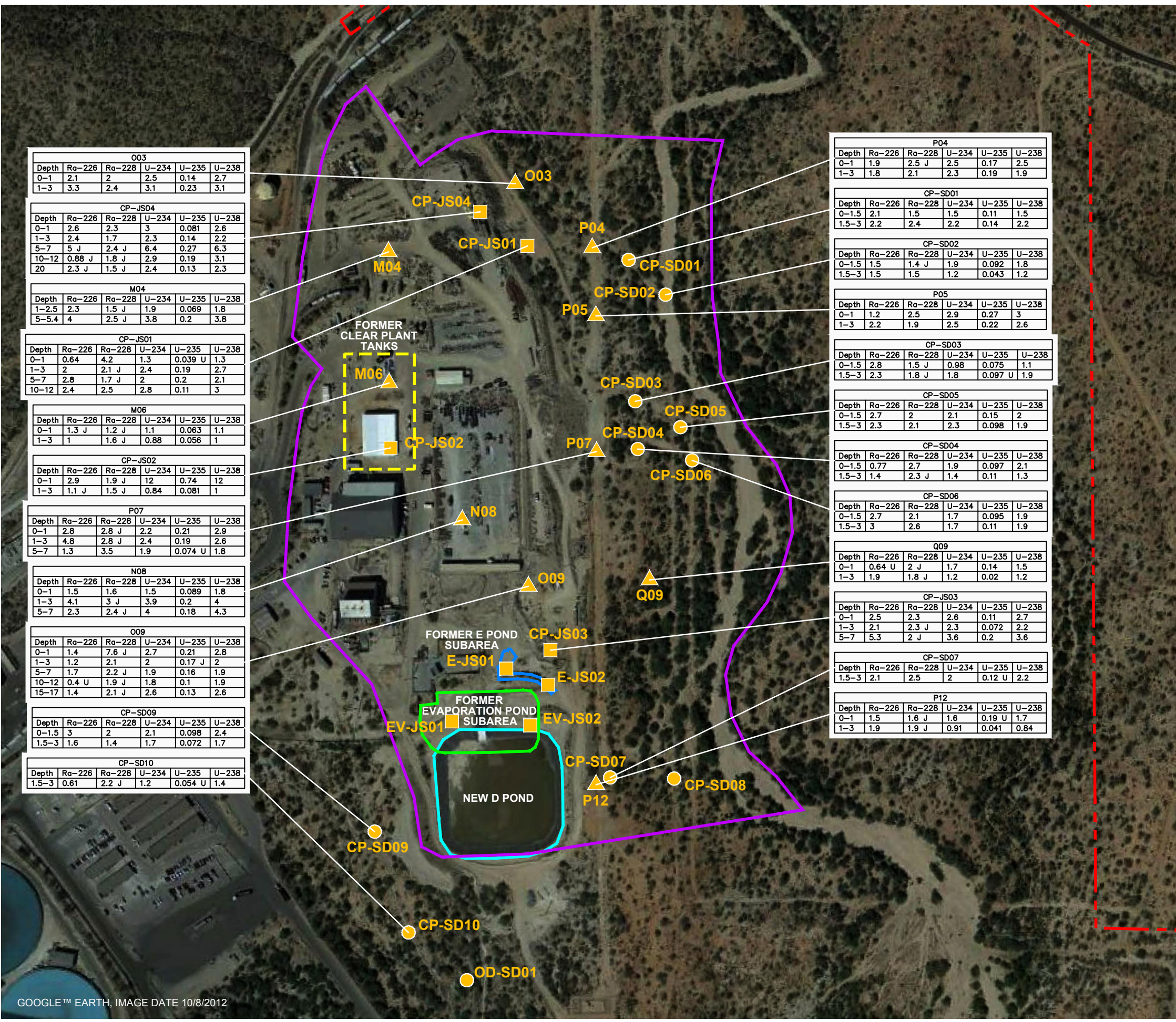


FIGURE
2-1

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XREFS: IMAGES: PROJECTNAME: AZ1233002.jpg



LEGEND

- CP-JS01 JUDGMENTAL SAMPLING LOCATION
- M04 GRID SAMPLING LOCATION
- CP-SD01 SEDIMENT SAMPLING LOCATION
- PROPERTY BOUNDARY
- FORMER CLEAR PLANT SUBAREA
- FORMER EVAPORATION POND SUBAREA (1979 AERIAL)
- FORMER E POND SUBAREA (1979 AERIAL)
- FORMER CLEAR PLANT TANKS (1979 AERIAL)
- NEW D POND

Ra-224 RADIUM-224 (pCi/g)

Ra-228 RADIUM-228 (pCi/g)

U-234 URANIUM-234 (pCi/g)

U-235 URANIUM-235 (pCi/g)

U-238 URANIUM-238 (pCi/g)

pCi/g PICOCURIES PER GRAM

J ESTIMATED VALUE

U ESTIMATED REPORTING LIMIT

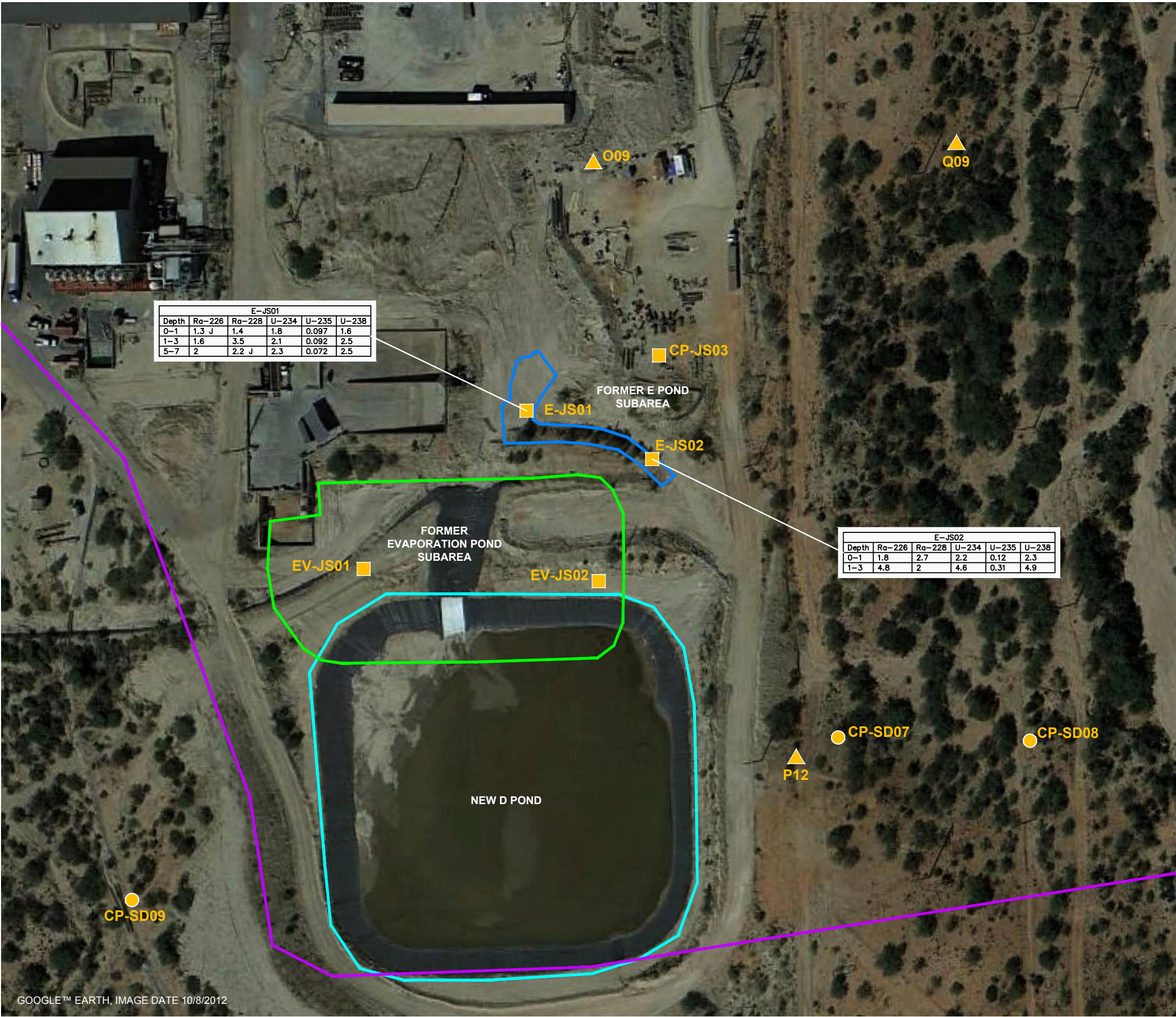
SAMPLE DEPTHS ARE MEASURED IN FEET BELOW GROUND SURFACE

SOURCE:

IMAGERY: GOOGLE™ EARTH, IMAGE DATE 10/8/2012

SAMPLING LOCATIONS: URS SURVEY 2008

0 300 600
FEET

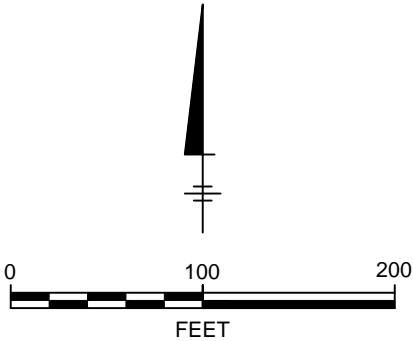


LEGEND

- E-JS01 JUDGMENTAL SAMPLING LOCATION
- Q09 GRID SAMPLING LOCATION
- CP-SD07 SEDIMENT SAMPLING LOCATION
- FORMER CLEAR PLANT SUBAREA
- FORMER EVAPORATION POND SUBAREA (1979 AERIAL)
- FORMER E POND SUBAREA (1979 AERIAL)
- NEW D POND

- Ra-224 RADIUM-224 (pCi/g)
- Ra-228 RADIUM-228 (pCi/g)
- U-234 URANIUM-234 (pCi/g)
- U-235 URANIUM-235 (pCi/g)
- U-238 URANIUM-238 (pCi/g)
- pCi/g PICOCURIES PER GRAM
- J ESTIMATED RESULT
- SAMPLE DEPTHS ARE MEASURED IN FEET BELOW GROUND SURFACE

SOURCE:
IMAGERY: GOOGLE™ EARTH, IMAGE DATE 10/8/2012
SAMPLING LOCATIONS: URS SURVEY 2008



FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

FORMER E POND SUBAREA
SAMPLE LOCATIONS AND
RADIONUCLIDE SAMPLE RESULTS



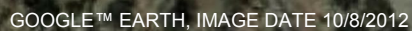


FIGURE
2-4

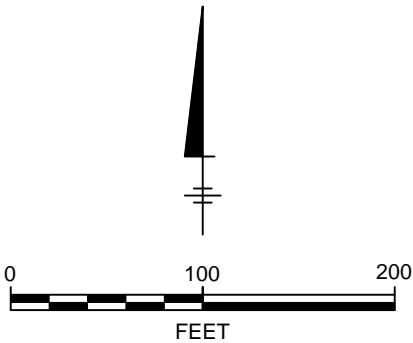


GOOGLE™ EARTH, IMAGE DATE 10/8/2012

LEGEND

- OD-JS01 ■ JUDGMENTAL SAMPLING LOCATION
- N08 ▲ GRID SAMPLING LOCATION
- OD-SD01 ● SEDIMENT SAMPLING LOCATION
- OLD D POND SUBAREA

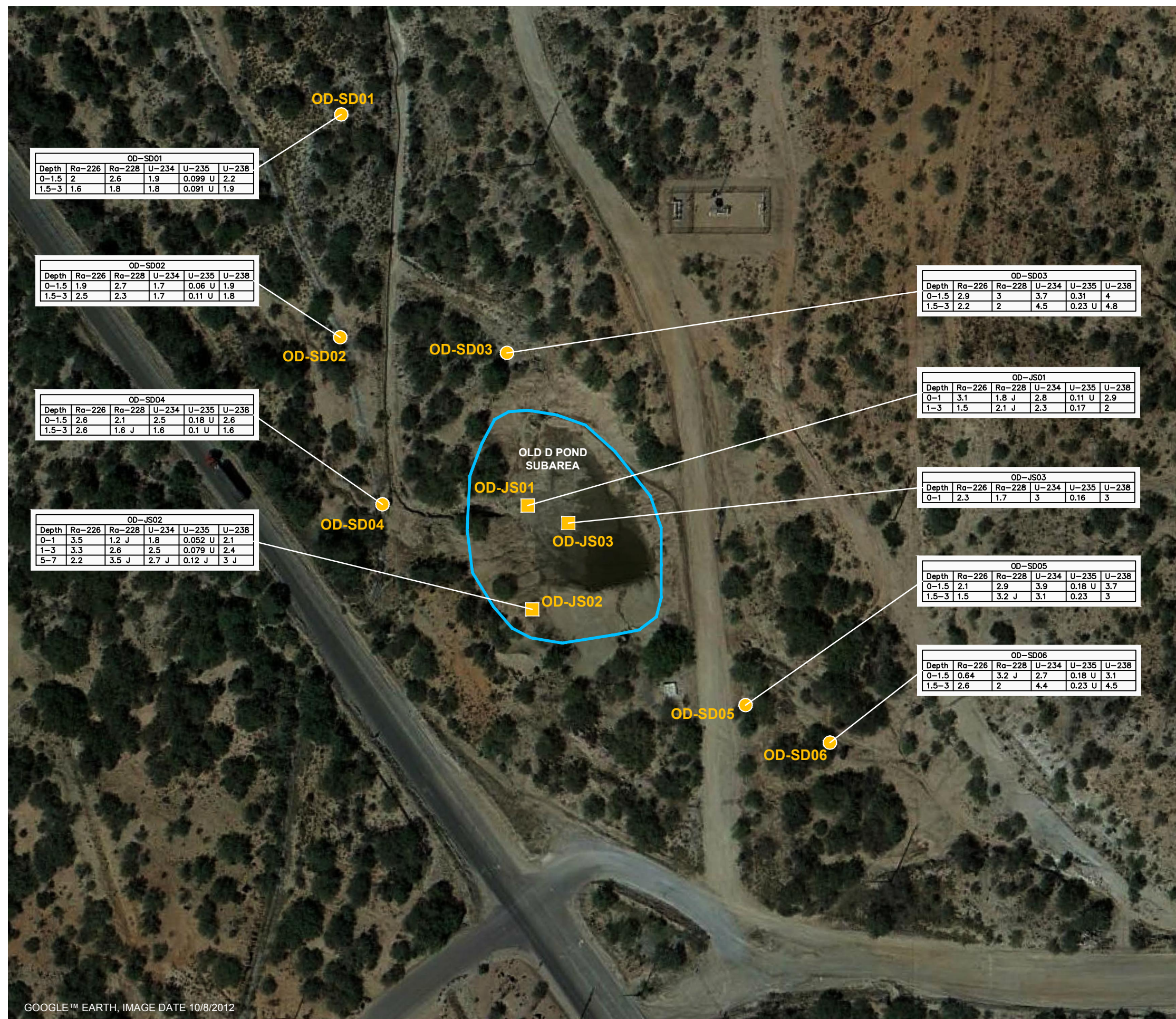
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SAMPLING LOCATIONS: URS SURVEY 2008



FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

OLD D POND SUBAREA
RADIONUCLIDE SAMPLE LOCATIONS





LEGEND

OD-JS01 JUDGMENTAL SAMPLING LOCATION

N08 ▲ GRID SAMPLING LOCATION

OD-SD01 ● SEDIMENT SAMPLING LOCATION

OLD D POND SUBAREA

Ra-224 RADIUM-224 (pCi/g)

Ra-228 RADIUM-228 (pCi/g)

U-234 URANIUM-234 (pCi/g)

U-235 URANIUM-235 (pCi/g)

U-238 URANIUM-238 (pCi/g)

pCi/g PICOCURIES PER GRAM

J ESTIMATED RESULT

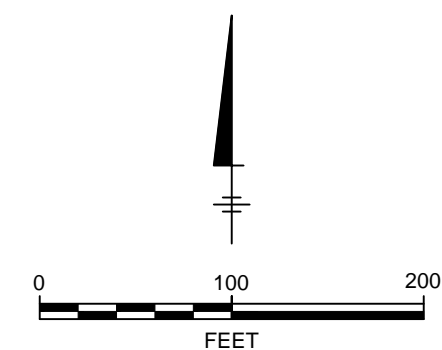
U ESTIMATED REPORTING LIMIT

SAMPLE DEPTHS ARE MEASURED IN FEET BELOW
GROUND SURFACE

SOURCE:

IMAGERY: GOOGLE™ EARTH, IMAGE DATE 10/8/2012

SAMPLING LOCATIONS: URS SURVEY 2008



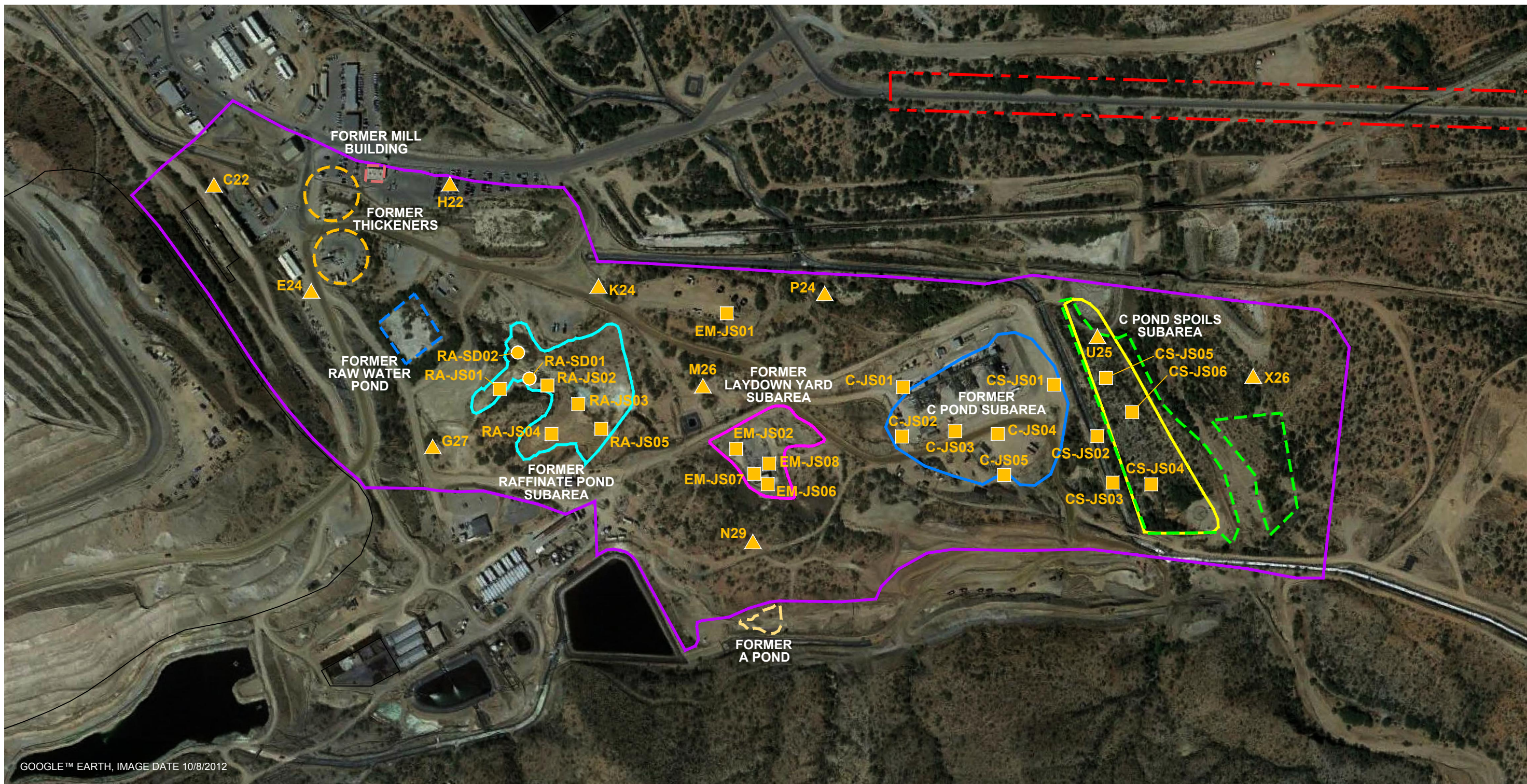
FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

OLD D POND SUBAREA RADIONUCLIDE SAMPLE RESULTS



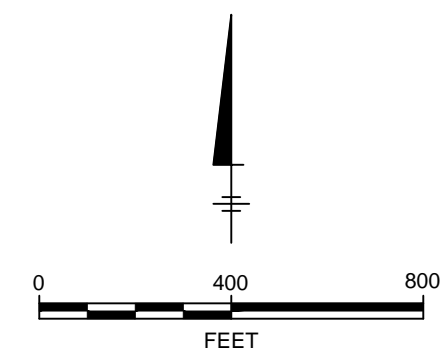
FIGURE
2-6

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ACADVER: 18.1S (LMS TECH) SAVED: 7/5/2013 9:59 AM



LEGEND

- | | | | |
|---------|-------------------------------|-------|-------------------------------|
| RA-JS01 | JUDGMENTAL SAMPLING LOCATION | — | C POND SPOILS SUBAREA |
| G27 | GRID SAMPLING LOCATION | — | FORMER RAFFINATE POND SUBAREA |
| RA-SD01 | SEDIMENT SAMPLING LOCATION | - - - | FORMER MILL BUILDING |
| - - - | PROPERTY BOUNDARY | - - - | FORMER THICKENER |
| — | FORMER ESPERANZA MILL SUBAREA | - - - | FORMER RAW WATER POND |
| — | FORMER LAYDOWN YARD SUBAREA | - - - | FORMER A POND |
| — | FORMER C POND SUBAREA | - - - | 404 MITIGATION AREA |



SOURCE:
IMAGERY: GOOGLE™ EARTH, IMAGE DATE 10/8/2012
SAMPLING LOCATIONS: URS SURVEY 2008

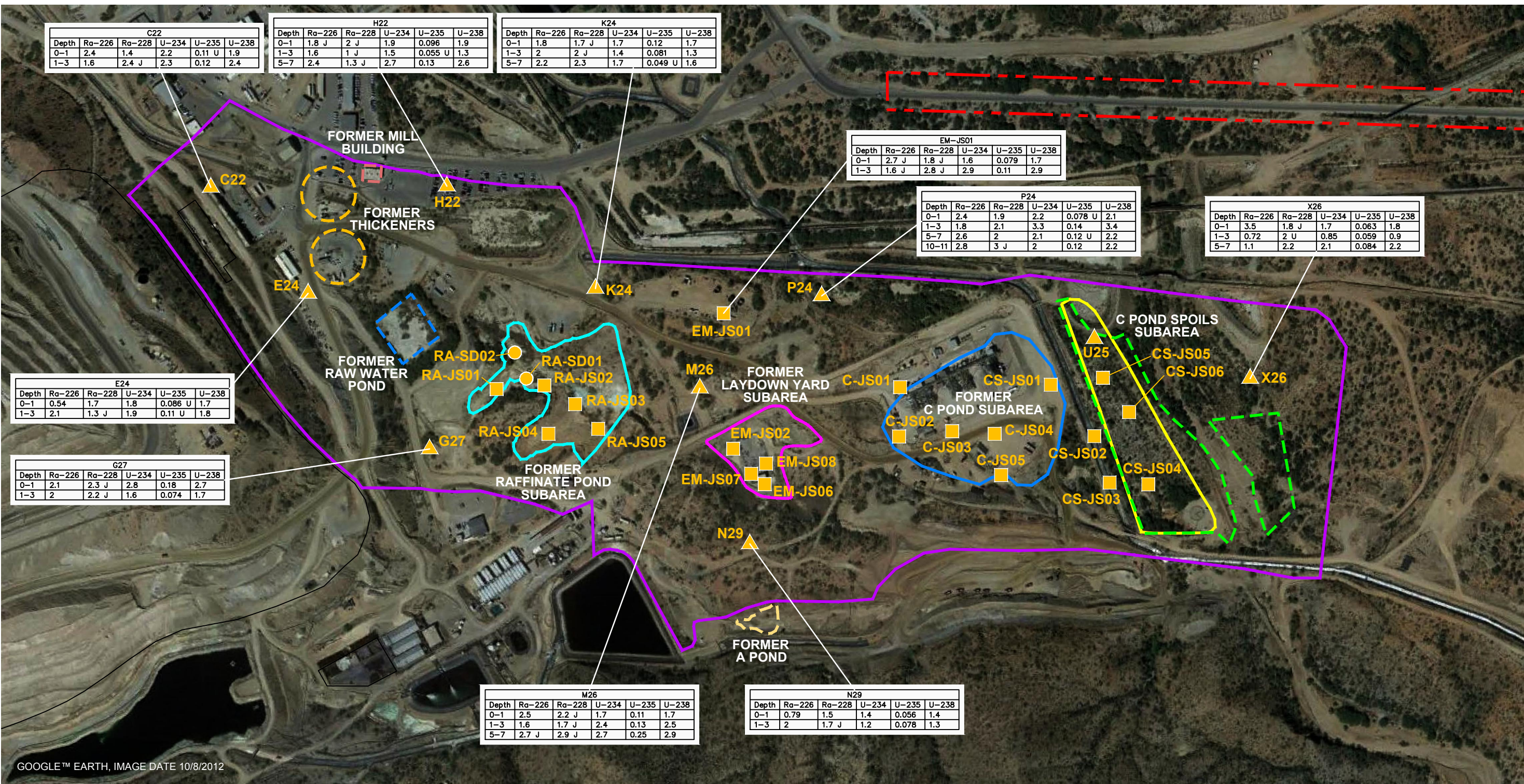
FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

FORMER ESPERANZA MILL SUBAREA
RADIONUCLIDE SAMPLE LOCATIONS



FIGURE
2-7

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SAVED: 7/5/2013 9:59 AM



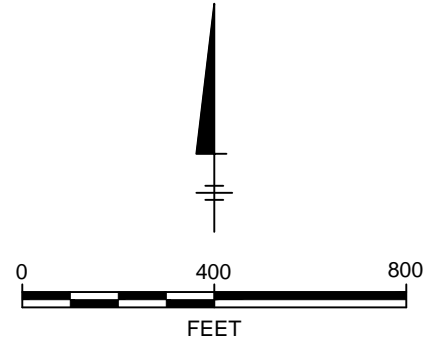
GOOGLE™ EARTH, IMAGE DATE 10/8/2012

LEGEND

- RA-JS01 JUDGMENTAL SAMPLING LOCATION
- G27 GRID SAMPLING LOCATION
- RA-SD01 SEDIMENT SAMPLING LOCATION
- PROPERTY BOUNDARY
- FORMER ESPERANZA MILL SUBAREA
- FORMER LAYDOWN YARD SUBAREA
- FORMER C POND SUBAREA
- C POND SPOILS SUBAREA
- FORMER RAFFINATE POND SUBAREA
- FORMER MILL BUILDING
- FORMER THICKENER
- FORMER RAW WATER POND
- FORMER A POND
- 404 MITIGATION AREA

- Ra-224 RADIUM-224 (pCi/g)
- Ra-228 RADIUM-228 (pCi/g)
- U-234 URANIUM-234 (pCi/g)
- U-235 URANIUM-235 (pCi/g)
- U-238 URANIUM-238 (pCi/g)
- pCi/g PICOCURIES PER GRAM
- J ESTIMATED VALUE
- U ESTIMATED REPORTING LIMIT

SAMPLE DEPTHS ARE MEASURED IN FEET BELOW GROUND SURFACE



SOURCE: IMAGERY: GOOGLE™ EARTH, IMAGE DATE 10/8/2012
SAMPLING LOCATIONS: URS SURVEY 2008

FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

**FORMER ESPERANZA MILL SUBAREA
RADIONUCLIDE SAMPLE RESULTS**

FIGURE
2-8



GOOGLE™ EARTH, IMAGE DATE 10/8/2012

LEGEND

- | | | | |
|--|-------------------------------|---|-----------------------|
| C-JS01 ■ | JUDGMENTAL SAMPLING LOCATION | — | FORMER C POND SUBAREA |
| N29 ▲ | GRID SAMPLING LOCATION | — | C POND SPOILS SUBAREA |
| — | FORMER ESPERANZA MILL SUBAREA | - - - | FORMER A POND |
| — | FORMER LAYDOWN YARD SUBAREA | - - - | 404 MITIGATION AREA |

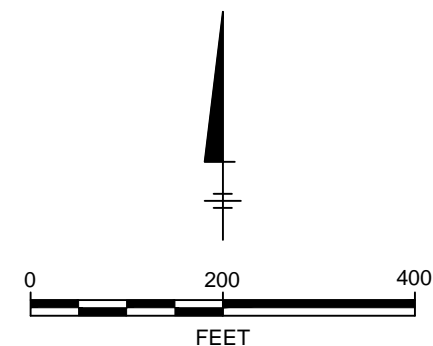
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SAMPLING LOCATIONS: URS SURVEY 2008

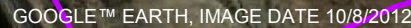
FREPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

**FORMER C POND AND C POND SPOILS
SUBAREA RADIONUCLIDE
SAMPLE LOCATIONS**



FIGURE
2-9



FIGURE
2-10



LEGEND

RA-JS01 ■ JUDGMENTAL SAMPLING LOCATION
G27 ▲ GRID SAMPLING LOCATON
RA-SD01 ● SEDIMENT SAMPLING LOCATION

— FORMER ESPERANZA MILL SUBAREA
— FORMER LAYDOWN YARD SUBAREA
— FORMER RAFFINATE POND SUBAREA
- - - FORMER RAW WATER POND

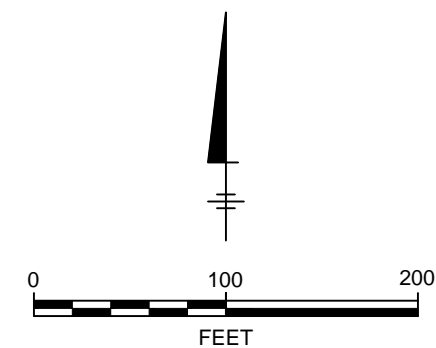
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SAMPLING LOCATIONS: URS SURVEY 2008

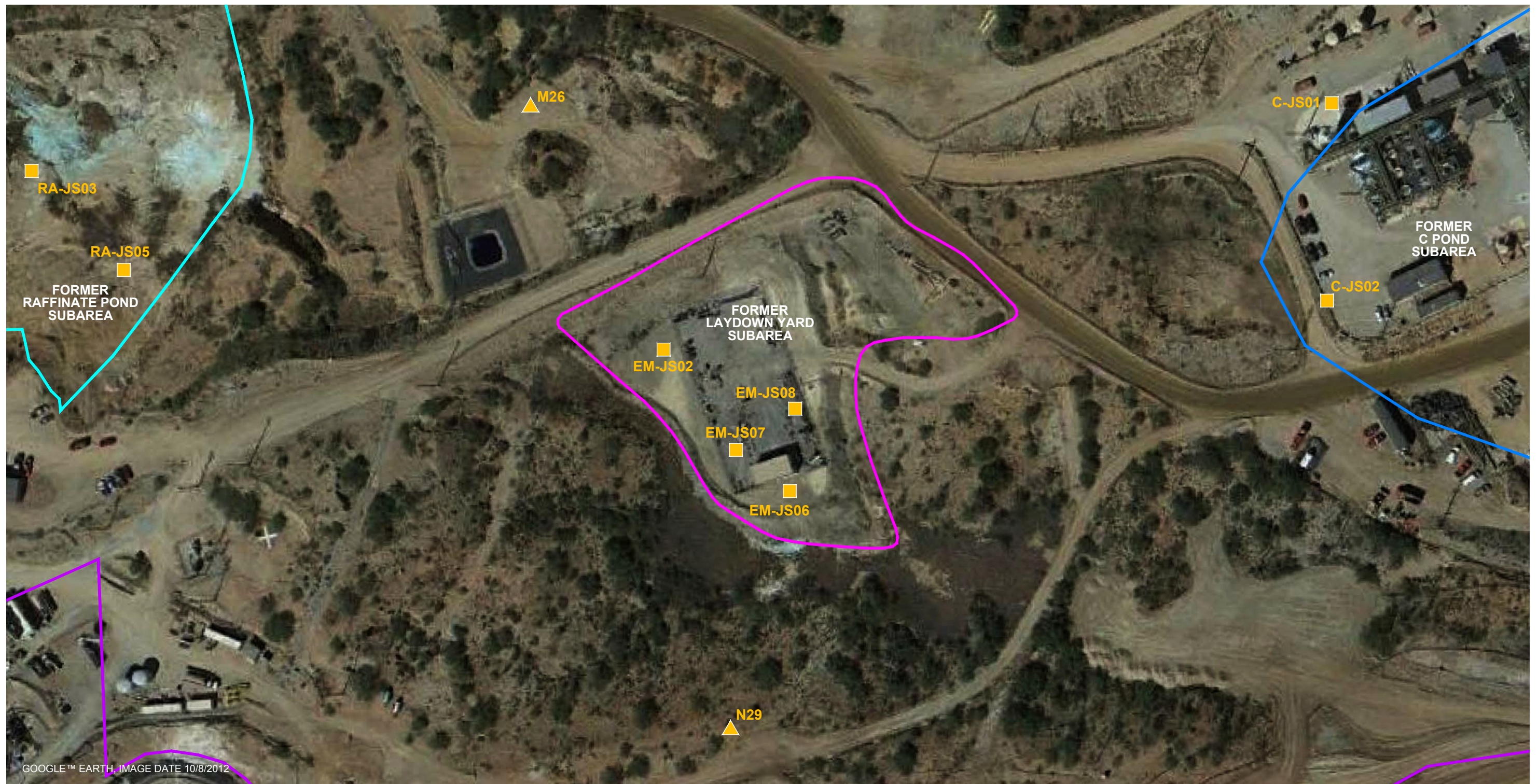
FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

**FORMER RAFFINATE POND SUBAREA
RADIONUCLIDE SAMPLE LOCATIONS**



FIGURE
2-11





LEGEND

EM-JS01 ■ JUDGMENTAL SAMPLING LOCATION
M26 ▲ GRID SAMPLING LOCATION

— FORMER ESPERANZA MILL SUBAREA
— FORMER LAYDOWN YARD SUBAREA
— FORMER RAFFINATE POND SUBAREA
— FORMER C POND SUBAREA

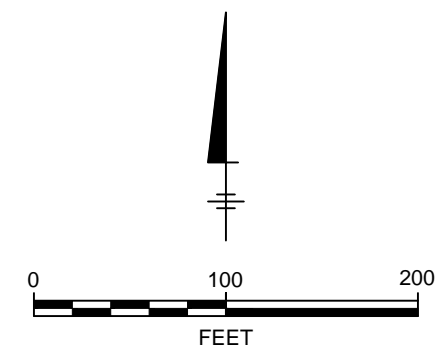
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SAMPLING LOCATIONS: URS SURVEY 2008

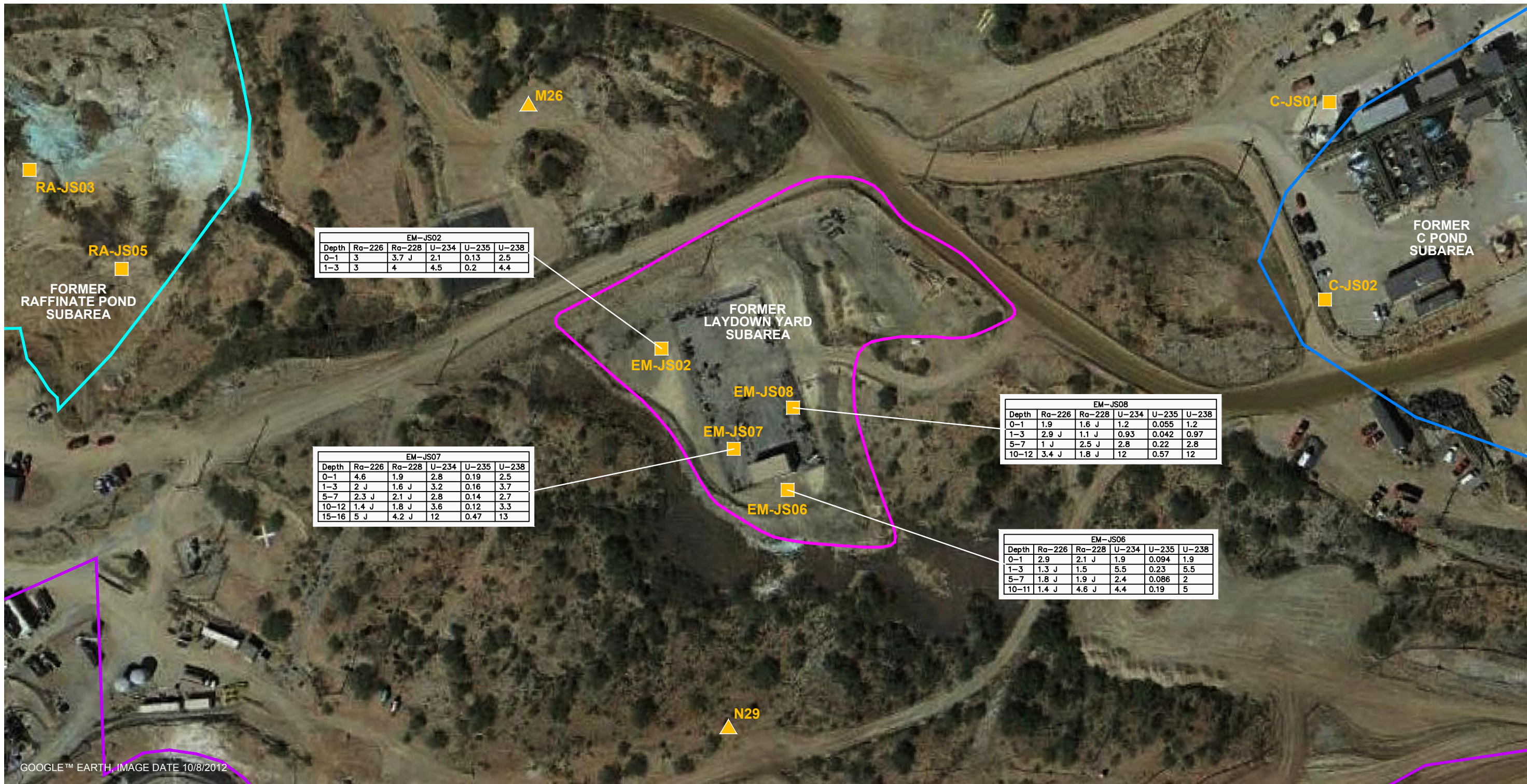
FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

**FORMER LAYDOWN YARD SUBAREA
RADIONUCLIDE SAMPLE LOCATIONS**



FIGURE
2-13





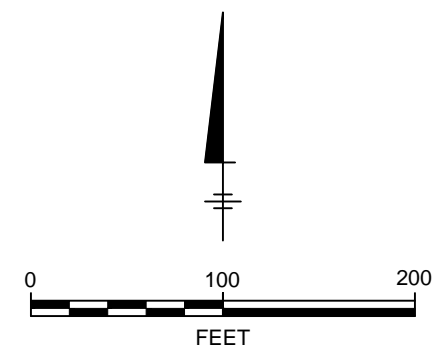
LEGEND

EM-JS01 ■ JUDGMENTAL SAMPLING LOCATION
M26 ▲ GRID SAMPLING LOCATION

— FORMER ESPERANZA MILL SUBAREA
— FORMER LAYDOWN YARD SUBAREA
— FORMER RAFFINATE POND SUBAREA
— FORMER C POND SUBAREA

Ra-224 RADIUM-224 (pCi/g)
Ra-228 RADIUM-228 (pCi/g)
U-234 URANIUM-234 (pCi/g)
U-235 URANIUM-235 (pCi/g)
U-238 URANIUM-238 (pCi/g)
pCi/g PICOCURIES PER GRAM
J ESTIMATED RESULT
U ESTIMATED REPORTING LIMIT

SAMPLE DEPTHS ARE MEASURED
IN FEET BELOW GROUND SURFACE



SOURCE:
IMAGERY: GOOGLE™ EARTH, IMAGE DATE 10/8/2012
SAMPLING LOCATIONS: URS SURVEY 2008

FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

FORMER LAYDOWN YARD SUBAREA
RADIONUCLIDE SAMPLE RESULTS



FIGURE
2-14



LEGEND

- RP-JS01** ■ JUDGMENTAL SAMPLING LOCATION
- FORMER RHENIUM PONDS SUBAREA

Ra-224 RADIUM-224 (pCi/g)

Ra-228 RADIUM-228 (pCi/g)

U-234 URANIUM-234 (pCi/g)

U-235 URANIUM-235 (pCi/g)

U-238 URANIUM-238 (pCi/g)

pCi/g PICOCURIES PER GRAM

J ESTIMATED VALUE

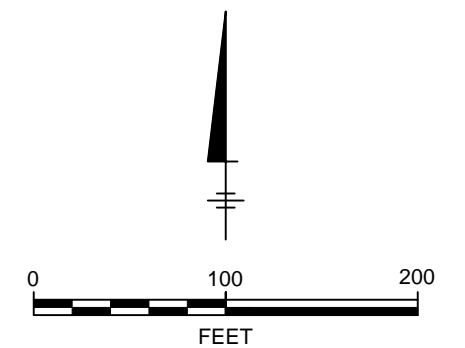
U ESTIMATED REPORTING LIMIT

SAMPLE DEPTHS ARE MEASURED IN FEET BELOW GROUND SURFACE

SOURCE:

IMAGERY: GOOGLE™ EARTH, IMAGE DATE 10/8/2012

SAMPLING LOCATIONS: URS SURVEY 2008



FREEPORT-MCMORAN SIERRITA
GREEN VALLEY, ARIZONA

**FORMER RHENIUM PONDS SUBAREA
SAMPLE LOCATIONS AND
RADIONUCLIDE SAMPLE RESULTS**



FIGURE

2-15



March 6, 2009

Mr. Billy Doris
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-175
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Doris:

Twenty soil samples were received from Freeport McMoRan Sierrita on December 17, 2008. The samples were scheduled for the following analyses:

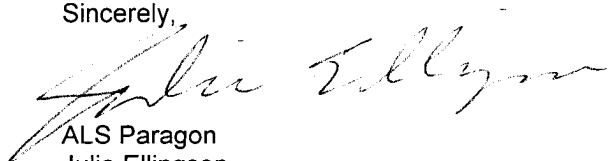
Isotopic Uranium pages 1-33
Gamma Spectroscopy pages 1-41

Radium-228 by Method 9320 pages 1-11
226Radium by EPA Method 903.1 (m) pages 1-24

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/mh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812175

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-03-0-1	0812175-1		SOIL	14-Jul-08	9:00
CP-JS-03-1-3	0812175-2		SOIL	14-Jul-08	9:00
CP-JS-03-5-7	0812175-3		SOIL	14-Jul-08	9:07
CP-M04-5-5.4	0812175-4		SOIL	11-Jul-08	10:15
E-JS-02-0-1	0812175-5		SOIL	14-Jul-08	10:33
E-JS-02-1-3	0812175-6		SOIL	14-Jul-08	10:33
E-JS-01-0-1	0812175-7		SOIL	14-Jul-08	10:58
E-JS-01-1-3	0812175-8		SOIL	14-Jul-08	10:58
E-JS-01-5-7	0812175-9		SOIL	14-Jul-08	11:11
EV-JS-01-0-1	0812175-10		SOIL	14-Jul-08	13:52
EV-JS-01-1-3	0812175-11		SOIL	14-Jul-08	13:52
CP-M04-1-2.5	0812175-12		SOIL	11-Jul-08	9:57
CP-O03-0-1	0812175-13		SOIL	11-Jul-08	10:52
CP-O03-1-3	0812175-14		SOIL	11-Jul-08	10:52
CP-M06-0-1	0812175-15		SOIL	11-Jul-08	12:56
CP-M06-1-3	0812175-16		SOIL	11-Jul-08	12:56
CP-JS-02-0-1	0812175-17		SOIL	11-Jul-08	13:20
CP-N08-0-1	0812175-18		SOIL	11-Jul-08	13:55
CP-N08-1-3	0812175-19		SOIL	11-Jul-08	13:55
CP-N08-5-7	0812175-20		SOIL	11-Jul-08	14:00



Paragon Analyticals

A Division of DataChem Laboratories, Inc.

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID)

Chain-of-Custody

Date 12/15/08 Page 1 of 2

Originator: Retain pink copy!

0812175

Project Name/No.: FMJ-VRP Sampler(s): K. Walsh Turnaround (circle one) Standard or Rush (Due _____) Dispose: Date 60 days or Return to Client

Report To: Steven Vaughn
Phone: (520) 407 2843
Fax:

E-mail: steven.vaughn@dcslab.com
Company: Freepoint MacMoran
Address: 6200 W. Duval Ave RJ.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers
CP-JS-03-0-1	7/14/08	900	1	S	n/a	1
CP-JS-03-1-3	7/14/08	900	2	S	n/a	1
CP-JS-03-3-7	7/14/08	907	3	S	n/a	1
CP-M04-5-5.4	7/14/08	1015	4	S	n/a	1
E-JS-02-0-1	7/14/08	1033	5	S	n/a	1
E-JS-02-1-3	7/14/08	1033	6	S	n/a	1
E-JS-01-0-1	7/14/08	1058	7	S	n/a	1
E-JS-01-1-3	7/14/08	1058	8	S	n/a	1
E-JS-01-5-7	7/14/08	1111	9	S	n/a	1
EV-JS-01-0-1	7/14/08	1352	10	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments:

Order No. C548VT

Trk # 797187199760

Relinquished By: (1)	Relinquished By: (2)
Signature <u>Kevin Walsh</u>	Signature _____
Printed Name <u>Kevin Walsh</u>	Printed Name _____
Date <u>12/15/08</u>	Date _____
Time <u>1600</u>	Time _____
Company <u>URS</u>	Company _____
Relinquished By: (1)	Relinquished By: (2)
Signature <u>Lara Jordan</u>	Signature _____
Printed Name <u>Lara Jordan</u>	Printed Name _____
Date <u>12/17/08</u>	Date _____
Time <u>1045</u>	Time _____
Company <u>ALS Paragon</u>	Company _____



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225 Commerce Drive Fort Collins, CO 80524

800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID) 0812175

Chain-of-Custody Date 12/15/08 Page 2 of 2

Originator: Retain pink copy!

Project Name/No.: <u>IM1-VRT</u> Sampler(s): <u>K. Walsh</u> Turnaround (circle one) <u>Standard</u> or Rush (Due <u> </u>) <u>Dispose</u> : Date <u>60 day</u> or Return to Client <u> </u>						
Report To: <u>Steven Vaughn</u> Phone: (520) 407 2845 Fax: <u> </u> E-mail: <u>steven.vaughn@dcslab.com</u> Company: <u>Freepoint McMoran</u> Address: <u>6200 W David Mue Rd.</u> <u>Green Valley, AZ 85614</u>						
Circle method (right); provide additional information as needed (comments).						
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers
EV-JS-01-1-3	7/14/08	1352	11	S	n/a	1
CP-M04-1-2-5	7/14/08	1457	12	S	n/a	1
CP-003-0-1	7/14/08	1052	13	S	n/a	1
CP-003-1-3	7/14/08	1052	14	S	n/a	1
CP-M06-0-0-1	7/14/08	1256	15	S	n/a	1
CP-M06-1-3	7/14/08	1256	16	S	n/a	1
CP-JS-02-0-1	7/14/08	1320	17	S	n/a	1
CP-N08-0-1	7/14/08	1355	18	S	n/a	1
CP-N08-1-3	7/14/08	1355	19	S	n/a	1
CP-N08-5-7	7/14/08	1400	20	S	n/a	1
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter						
Comments: <u>Order No. 0508VT</u>						
Tick# <u>797187194760</u>						
Form 202r6.xls (6/16/06)						

Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K. Walsh</u>	Signature <u> </u>	Signature <u> </u>	Signature <u> </u>
Printed Name <u>Kevin Walsh</u>	Printed Name <u> </u>	Printed Name <u> </u>	Printed Name <u> </u>
Date <u>12/15/08</u>	Date <u> </u>	Date <u> </u>	Date <u> </u>
Time <u>1600</u>	Time <u> </u>	Time <u> </u>	Time <u> </u>
Company <u>DCS</u>	Company <u> </u>	Company <u> </u>	Company <u> </u>
Received By: (1)		Received By: (2)	
Signature <u>Jana Johnson</u>	Signature <u> </u>	Signature <u> </u>	Signature <u> </u>
Printed Name <u>Jana Johnson</u>	Printed Name <u> </u>	Printed Name <u> </u>	Printed Name <u> </u>
Date <u>12/17/08</u>	Date <u> </u>	Date <u> </u>	Date <u> </u>
Time <u>1045</u>	Time <u> </u>	Time <u> </u>	Time <u> </u>
Company <u>ALS Paragon</u>	Company <u> </u>	Company <u> </u>	Company <u> </u>

TPH	SW8015B GRO DRO (circle one or both)	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Uranium Isotopes	234, 235, 238
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CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812175
Initials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	YES NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	<u>YES</u>	YES NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>13</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #19 and 20 (CP-N08-1-3 and CP-N08-5-7) The samples have ID labels and also have all the ID information written on the lids. For samples 19 and 20, The label for sample 19 matches the lid on sample 20; the label for sample 20 matches the lid on 19. use bottle labels

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: emailProject Manager Signature / Date: [Signature] 12/22/08

*IR Gun #2: Oakton. SN 29922500201-0066

*IR Gun #4: Oakton. SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111208/26/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.1

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

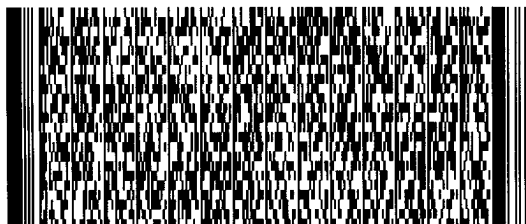
0812175

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524



2 of 4

WED - 17DEC

AA

MPS# 7971 8719 9760

0263

STANDARD OVERNIGHT

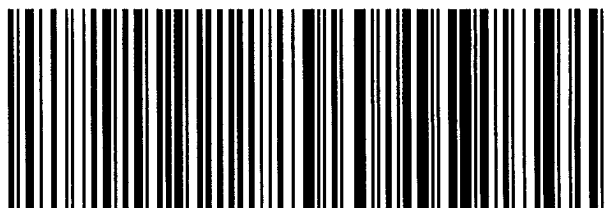
Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



March 6, 2009

Mr. Steven Vaughn
URS Corporation
333 E Wetmore Rd., Suite 400
Tucson, AZ 85614

Re: ALS Paragon Workorder: 08-12-175
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Vaughn:

Twenty soil samples were received from Freeport McMoRan Sierrita on December 17, 2008. The samples were scheduled for the following analyses:

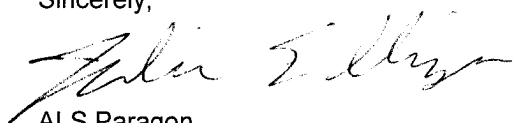
Isotopic Uranium pages 1-33
Gamma Spectroscopy pages 1-41

Radium-228 by Method 9320 pages 1-11
226Radium by EPA Method 903.1 (m) pages 1-24

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/mh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812175

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-03-0-1	0812175-1		SOIL	14-Jul-08	9:00
CP-JS-03-1-3	0812175-2		SOIL	14-Jul-08	9:00
CP-JS-03-5-7	0812175-3		SOIL	14-Jul-08	9:07
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E-JS-02-1-3	0812175-6		SOIL	14-Jul-08	10:33
E-JS-01-0-1	0812175-7		SOIL	14-Jul-08	10:58
E-JS-01-1-3	0812175-8		SOIL	14-Jul-08	10:58
E-JS-01-5-7	0812175-9		SOIL	14-Jul-08	11:11
EV-JS-01-0-1	0812175-10		SOIL	14-Jul-08	13:52
EV-JS-01-1-3	0812175-11		SOIL	14-Jul-08	13:52
CP-M04-1-2.5	0812175-12		SOIL	11-Jul-08	9:57
CP-O03-0-1	0812175-13		SOIL	11-Jul-08	10:52
CP-O03-1-3	0812175-14		SOIL	11-Jul-08	10:52
CP-M06-0-1	0812175-15		SOIL	11-Jul-08	12:56
CP-M06-1-3	0812175-16		SOIL	11-Jul-08	12:56
CP-JS-02-0-1	0812175-17		SOIL	11-Jul-08	13:20
CP-N08-0-1	0812175-18		SOIL	11-Jul-08	13:55
CP-N08-1-3	0812175-19		SOIL	11-Jul-08	13:55
CP-N08-5-7	0812175-20		SOIL	11-Jul-08	14:00



Paragon Analyticals

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Chain-of-Custody

Date 12/15/08

Page 1 of 2

Originator: Retain pink copy!

0812175

Accession Number (LAB ID)

Project Name/No.: FMJ-VZP Sampler(s): K. Walsh Turnaround (circle one) Standard or Rush (Due _____) Dispose: Date 60 days or Return to Client

Report To: Steven Vaughn
Phone: (520) 407 2843
Fax:

E-mail: steven.vaughn@dcslab.com
Company: Freepoint MacMoran
Address: 6200 W. Duval Ave RJ.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers
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EV-JS-01-0-1	7/14/08	1352	10	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments:

Order No. C548VT

Trk # 797187199760

SW8260B	VOCs	SW8021B	BTEX (only)	SW8270C	SVOCs	SW8081A	OC Pesticides	SW8082	PCBs	SW8151A	Herbicides	SW8330	Explosives	SW8260B 8270C 8081A 8151A	TCLP Metals SW1311 Hg	SW6010B 7470 E200.7	Total Metals by ICP Hg	SW6010B 7470 E200.7	Dissolved Metals by ICP/MS	SW6020A E200.8	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	Total E160.3 TDS E160.1 TSS E160.2	PH	SW9040B SW9045C	TPH	SW8015B GRO DRO (circle one or both)	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Uranium Isotopes 234, 235, 238
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Relinquished By:	(1)	Signature <u>Kevin Walsh</u>	Signature _____	(2)
Printed Name <u>Kevin Walsh</u>	Printed Name _____	Date <u>12/15/08</u>	Date _____	
Time <u>1600</u>	Time _____	Company <u>URS</u>	Company _____	
Received By:	(1)	Signature <u>Lara Jordan</u>	Signature _____	(2)
Printed Name <u>Lara Jordan</u>	Printed Name _____	Date <u>12/17/08</u>	Date _____	
Time <u>1045</u>	Time _____	Company <u>ALS Paragon</u>	Company _____	



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Accession Number (LAB ID) 0812175

Chain-of-Custody Date 12/15/08 Page 2 of 2

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Project Name/No.: <u>IM1-VRT</u> Sampler(s): <u>K. Walsh</u> Turnaround (circle one) <u>Standard</u> or Rush (Due <u> </u>) <u>Dispose</u> Date <u>60 day</u> or Return to Client						
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Circle method (right); provide additional information as needed (comments).						
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CP-M04-1-2-5	7/14/08	1457	12	S	n/a	1
CP-003-0-1	7/14/08	1052	13	S	n/a	1
CP-003-1-3	7/14/08	1052	14	S	n/a	1
CP-M06-0-0-1	7/14/08	1256	15	S	n/a	1
CP-M06-1-3	7/14/08	1256	16	S	n/a	1
CP-JS-02-0-1	7/14/08	1320	17	S	n/a	1
CP-N08-0-1	7/14/08	1355	18	S	n/a	1
CP-N08-1-3	7/14/08	1355	19	S	n/a	1
CP-N08-5-7	7/14/08	1400	20	S	n/a	1
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter						
Comments: <u>Order No. 0508VT</u>						
Tick# <u>797187194760</u>						
Form 202r6.xls (6/16/06)						

Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K. Walsh</u>	Signature <u> </u>	Signature <u> </u>	Signature <u> </u>
Printed Name <u>Kevin Walsh</u>	Printed Name <u> </u>	Printed Name <u> </u>	Printed Name <u> </u>
Date <u>12/15/08</u>	Date <u> </u>	Date <u> </u>	Date <u> </u>
Time <u>1600</u>	Time <u> </u>	Time <u> </u>	Time <u> </u>
Company <u>DCS</u>	Company <u> </u>	Company <u> </u>	Company <u> </u>
Received By: (1)		Received By: (2)	
Signature <u>Jana Johnson</u>	Signature <u> </u>	Signature <u> </u>	Signature <u> </u>
Printed Name <u>Jana Johnson</u>	Printed Name <u> </u>	Printed Name <u> </u>	Printed Name <u> </u>
Date <u>12/17/08</u>	Date <u> </u>	Date <u> </u>	Date <u> </u>
Time <u>1045</u>	Time <u> </u>	Time <u> </u>	Time <u> </u>
Company <u>ALS Paragon</u>	Company <u> </u>	Company <u> </u>	Company <u> </u>

SW8260B	VOCS	SW8021B	BTEX (only)	SW8270C	SVOCs	SW8081A	OC Pesticides	SW8082	PCBs	SW8151A	Herbicides	SW8330	Explosives	SW8260B 8270C 8081A 8151A	TCLP Metals SW1311 Hg	SW6010B 7470	Total Metals by ICP Hg	SW6010B 7470 E200.7	Dissolved Metals by ICP Hg	SW6020A E200.8	Total Metals by ICP/MS	SW6020A E200.8	Dissolved Metals by ICP/MS	SW6020A E200.8	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	SW9056 E300.0 (specify in comments)	Inorganic Anions	Total E160.3 TDS E160.1 TSS E160.2	PH	SW9040B SW9045C	TPH	SW8015B GRO DRO (circle one or both)	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Uranium Isotopes 234, 235, 238
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CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812175
Initials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	YES NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	<u>YES</u>	YES NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>13</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #19 and 20 (CP-N08-1-3 and CP-N08-5-7) The samples have ID labels and also have all the ID information written on the lids. For samples 19 and 20, The label for sample 19 matches the lid on sample 20; the label for sample 20 matches the lid on 19. use bottle labels

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: emailProject Manager Signature / Date: JME 12/22/08

*IR Gun #2: Oakton. SN 29922500201-0066

*IR Gun #4: Oakton. SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111208/26/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.1

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

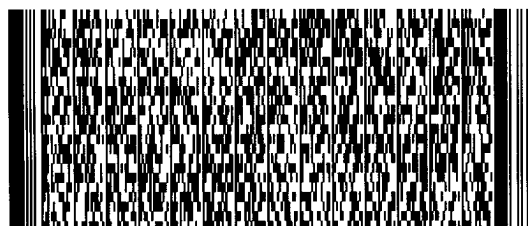
0812175

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524



2 of 4

WED - 17DEC

AA

MPS# 7971 8719 9760

0263

STANDARD OVERNIGHT

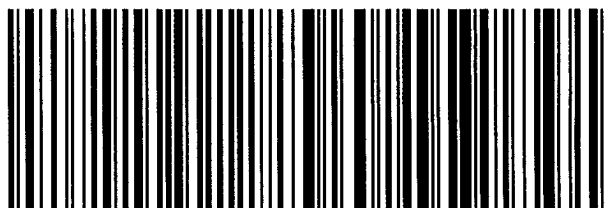
Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita FMI-VRP

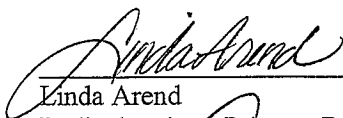
Work Order Number: 0812175

1. The following report consists of analytical results for 18 soil samples received by ALS Paragon on 12/17/08.
2. The samples were prepared according to procedure SOP739R9. Samples 0812175-4, -12, -13, -14, -15, -16, and -18 were sealed in steel cans on 12/24/08 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/14/09 is at least 97.8%. Conservatively, assuming a radon emanation efficiency of approximately 50% the effective radon progeny in-growth for these samples would be greater than 98.9%. The remaining samples in the work order were packed in standard 100 gram geometry and analyzed for ^{228}Ra only.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/14/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volumes were insufficient to allow preparation of duplicates. A duplicate analysis of sample 0812175-2 was performed in lieu of prepared duplicates.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the associated samples.
7. The library used for calibration and analysis for samples 0812175-4, -12, -13, -14, -15, -16, and -18 employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium.

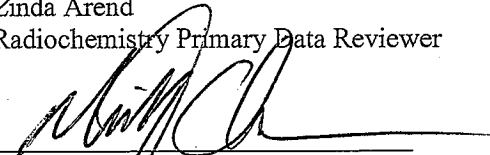


8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than or greater than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for samples 0812175-3, -9, -10, -15, -17, and the results for sample 0812175-3 may be biased low. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. Due to the nature of electronics involved in gamma spectroscopy, any detector acquiring data with the same multi-channel buffer (MCB) is affected by all other detector inputs in that same MCB. A high activity calibration source was counting in detector 4, which is in the same MCB as detector 3. Sample 0812175-17 was counted in detector 3 on 01/13/09. Thus, the observed dead time for this sample count was greater than 10% at 12.58%. Analyst review of the data does not indicate a problem with the spectral acquisition for this sample. Results are submitted without further qualification. Please refer to QASS 360429.
11. The requested detection limit of 1 pCi/gram for ^{228}Ra was not met for samples 0812175-2DUP, -4, -5, -6, -9, -12, -16, -17, and -20, as identified with an "M3" qualifier on the final reports. The reported activity for these samples is greater than the achieved detection limit. Results are submitted without further qualification.
12. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Linda Arend
Radiochemistry Primary Data Reviewer

01/29/09
Date


Radiochemistry Final Data Reviewer

01/29/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812175

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-03-0-1	0812175-1		SOIL	14-Jul-08	9:00
CP-JS-03-1-3	0812175-2		SOIL	14-Jul-08	9:00
CP-JS-03-5-7	0812175-3		SOIL	14-Jul-08	9:07
CP-M04-5-5.4	0812175-4		SOIL	11-Jul-08	10:15
E-JS-02-0-1	0812175-5		SOIL	14-Jul-08	10:33
E-JS-02-1-3	0812175-6		SOIL	14-Jul-08	10:33
E-JS-01-0-1	0812175-7		SOIL	14-Jul-08	10:58
E-JS-01-1-3	0812175-8		SOIL	14-Jul-08	10:58
E-JS-01-5-7	0812175-9		SOIL	14-Jul-08	11:11
EV-JS-01-0-1	0812175-10		SOIL	14-Jul-08	13:52
EV-JS-01-1-3	0812175-11		SOIL	14-Jul-08	13:52
CP-M04-1-2.5	0812175-12		SOIL	11-Jul-08	9:57
CP-O03-0-1	0812175-13		SOIL	11-Jul-08	10:52
CP-O03-1-3	0812175-14		SOIL	11-Jul-08	10:52
CP-M06-0-1	0812175-15		SOIL	11-Jul-08	12:56
CP-M06-1-3	0812175-16		SOIL	11-Jul-08	12:56
CP-JS-02-0-1	0812175-17		SOIL	11-Jul-08	13:20
CP-N08-0-1	0812175-18		SOIL	11-Jul-08	13:55
CP-N08-1-3	0812175-19		SOIL	11-Jul-08	13:55
CP-N08-5-7	0812175-20		SOIL	11-Jul-08	14:00



Paragon Analytics
A Division of DataChem Laboratories, Inc.
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID)

Chain-of-Custody Date 12/15/08 Page 1 of 2

0812175

Project Name/No: FMI-VZP

Turnaround (circle one) Standard or Rush (Due

1) Dispose: Date 60 days or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2843

Fax:

E-mail: steven_vavich@gulfcorp.com

Company: *Freeport Mac*

Address: 6200 1st Avenue NW - 31

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers
CP-JS-03-0-1	7/14/08	900	1	5	n/a	1
CP-JS-03-1-3	7/14/08	900	2	5	n/a	1
CP-JS-03-5-7	7/14/08	907	3	5	n/a	1
CP-M04-5-5-4	7/14/08	1015	4	5	n/a	1
E-JS-02-0-1	7/14/08	1033	5	5	n/a	1
E-JS-02-1-3	7/14/08	1033	6	5	n/a	1
E-JS-01-0-1	7/14/08	1058	7	5	n/a	1
E-JS-01-1-3	7/14/08	1058	8	5	n/a	1
E-JS-01-5-7	7/14/08	1111	9	5	n/a	1
EV-JS-01-0-1	7/14/08	1352	10	5	n/a	1

* Time Zone: EST CST MST PST **Matrix Key:** O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. C568VT

Trk # 797187199760

Relinquished By: <u>Kevin Walsh</u>	(1)	Relinquished By: <u>Kevin Walsh</u>	(2)
Signature _____		Signature _____	
Printed Name <u>Kevin Walsh</u>		Printed Name _____	
Date <u>12/15/08</u> Time <u>1600</u>		Date _____ Time _____	
Company <u>URS</u>		Company _____	
Received By: <u>Lara Jorban</u>	(1)	Received By: _____	(2)
Signature _____		Signature _____	
Printed Name <u>Lara Jorban</u>		Printed Name _____	
Date <u>12/17/08</u> Time <u>1045</u>		Date _____ Time _____	
Company <u>ALS Paragon</u>		Company _____	

Form 202r6.xls (6/16/06)



Paragon Analyticals

A Division of DataChem Laboratories, Inc.

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Chain-of-Custody

Accession Number (LAB ID) 0812175
Date 12/15/08 Page 2 of 2
Originator: Retain pink copy!

Project Name/No.: <u>PM1-VRT</u>	Sampler(s): <u>K. Walsh</u>	Turnaround (circle one) <u>Standard</u> or <u>Rush</u> (Due <u>60 day</u> or <u>Return to Client</u>)					
Report To: Steven Vaughan Phone: (520) 407 2845 Fax: E-mail: steven_vanvaughan@dcsl.com Company: Freeport Mc Moran Address: 6200 W Duval Mine Rd. Green Valley, AZ 85614							
Sample ID	Date	Time*	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers	Circle method (right); provide additional information as needed (comments).
EV-JS-01-1-3	7/14/08	1352	11	S	n/a	1	
CP-M04-1-2-5	7/11/08	1457	12	S	n/a	1	
CP-003-0-1	7/11/08	1052	13	S	n/a	1	
CP-003-1-3	7/11/08	1052	14	S	n/a	1	
CP-M06-0-1	7/11/08	1256	15	S	n/a	1	
CP-M06-1-3	7/11/08	1256	16	S	n/a	1	
CP-JS-02-0-1	7/11/08	1320	17	S	n/a	1	
CP-N08-0-1	7/11/08	1355	18	S	n/a	1	
CP-N08-1-3	7/11/08	1355	19	S	n/a	1	
CP-N08-5-7	7/11/08	1400	20	S	n/a	1	
*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments: <u>Order No. 0508VT</u>							
Tick# <u>797187199760</u>							
Relinquished By: <u>K. Walsh</u> Signature <u>Kevin Walsh</u> Printed Name <u>Kevin Walsh</u> Date <u>12/15/08</u> Time <u>1600</u>							(1)
Relinquished By: <u>John J. Wilson</u> Signature <u>John J. Wilson</u> Printed Name <u>John J. Wilson</u> Date <u>12/17/08</u> Time <u>1045</u>							(2)
Relinquished By: <u>ALS Paragon</u> Signature <u>ALS Paragon</u> Printed Name <u>ALS Paragon</u> Date <u>12/17/08</u> Time <u>1045</u>							(2)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812175
Initials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u> NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	YES NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<u>YES</u>	YES NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #19 and 20 (CP-N08-1-3 and CP-N08-5-7) The samples have ID labels and also have all the ID information written on the lids. For samples 19 and 20, The label for sample 19 matches the lid on sample 20; the label for sample 20 matches the lid on 19. use bottle labels

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: emailProject Manager Signature / Date: [Signature] 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111268/28/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.1

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812175

2 of 4

WED - 17DEC

AA

MPS# 7971 8719 9760
 0263

STANDARD OVERNIGHT

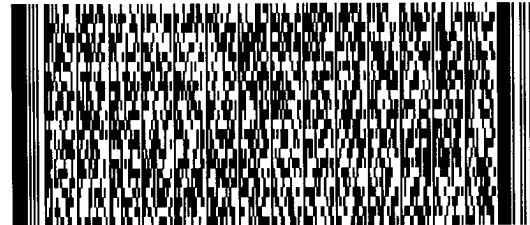
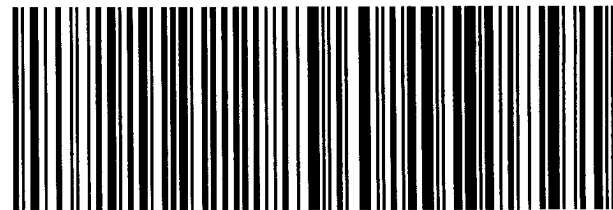
Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

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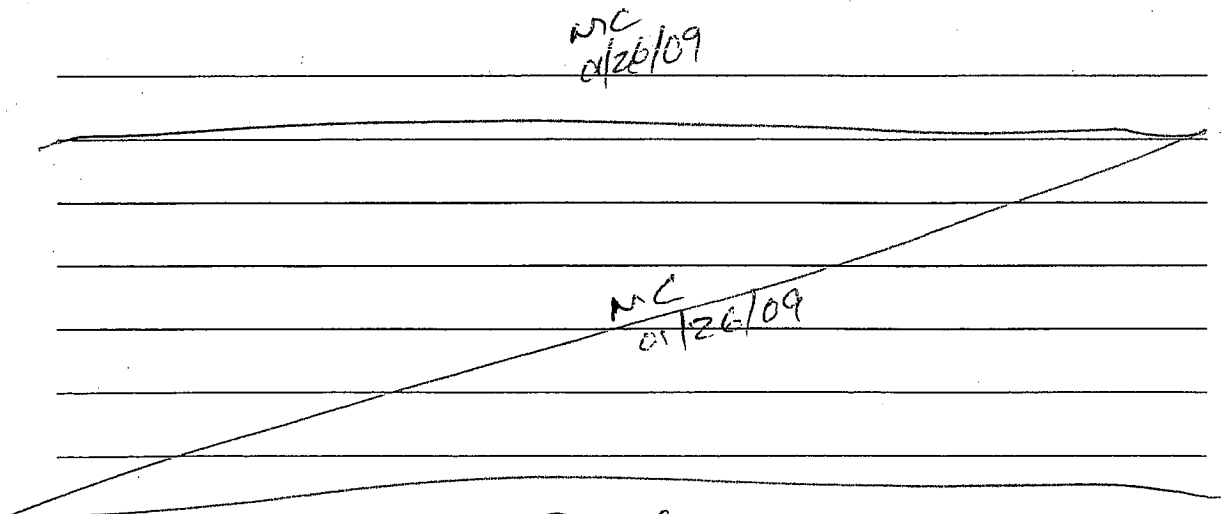
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QUALITY ASSURANCE SUMMARY SHEET

65081218-2
 PAR W.O. # / BATCH 0812175, 0812176
 TEST γ-SPEC
 METHOD γ-SCAN
 SOP/REV (PREP) —
 SOP/REV (ANAL) 713

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

MC 01/26/09
 Samples 0812175-17 and 0812176-3 were counted on 1/13/09 in detector 3. The observed dead time for the sample counts was greater than 10%, at 12.58% and 12.28%, respectfully. During the spectral acquisition of these samples, a high activity calibration source was counting in detector 4. This detector is in the same multi-channel buffer (MCB) as detector 3. Due to the nature of the electronics involved in gamma spectroscopy, any detector acquiring data within the same MCB is affected by all other detector inputs in that MCB. Thus, the source activity in detector 4 caused an increase in the dead time observed for the entire MCB containing detectors 3 and 4. Analyst review of the raw data does not indicate any problems with the spectral acquisition for these samples. All data quality objectives were met and the results are submitted without further qualification. *MC 01/26/09*



TECHNICIAN/ANALYST

[Signature]

DATE 01/26/09

DEPARTMENT MANAGER

[Signature]

DATE 1-27-09

360429

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-2MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Final Aliquot: 97.8 g

Result Units: pCi/g

File Name: 090086d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.019 +/- 0.35	0.68	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-2MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Final Aliquot: 199 g

Result Units: pCi/g

File Name: 090073d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.070 +/- 0.19	0.38	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-2MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Final Aliquot: 199 g

Result Units: pCi/g

File Name: 090073d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.081 +/- 0.34	0.65	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-2LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090029d08

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1130 +/- 132	2.85	986	114	85 - 115	P
10198-40-0	Co-60	462 +/- 54.2	1.21	457	101	85 - 115	P
10045-97-3	Cs-137	377 +/- 44.3	1.56	374	101	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-2ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090037d08

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	459 +/- 53.7	2.34	470	97.5	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-2LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090081d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	480 +/- 57.3	12.2	462	104	85 - 115	P
10198-40-0	Co-60	211 +/- 24.8	0.934	214	98.4	85 - 115	P
10045-97-3	Cs-137	179 +/- 21.1	1.31	175	102	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-1-3
Lab ID: 0812175-2DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 14-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2
QCBatchID: GS090106-2-1
Run ID: GS090106-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 100 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090062d09

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.3 +/- 0.64	1.6 +/- 0.62	0.72	2.13	M3

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-0-1

Lab ID: 0812175-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 94.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090056d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.61	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-1-3

Lab ID: 0812175-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 100 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090057d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.64	0.89	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-1-3

Lab ID: 0812175-2DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 100 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090062d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.62	1.3	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-5-7

Lab ID: 0812175-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 120 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090025d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.52	0.74	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-5-5.4

Lab ID: 0812175-4

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 185 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090067d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.0 +/- 0.61	0.57	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-5-5.4

Lab ID: 0812175-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 185 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090067d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.72	1.1	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-02-0-1

Lab ID: 0812175-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 99.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090061d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.71	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	E-JS-02-1-3
Lab ID:	0812175-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 104 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090068d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.63	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	E-JS-01-0-1
Lab ID:	0812175-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 98.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090058d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.50	0.88	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-5-7

Lab ID: 0812175-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 80.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090026d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.66	1.2	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-0-1

Lab ID: 0812175-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090083d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.59	0.88	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-M04-1-2.5
Lab ID:	0812175-12

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 194 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.42	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-1-2.5

Lab ID: 0812175-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 194 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.60	1.1	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-O03-0-1
Lab ID:	0812175-13

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090035d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.38	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-O03-0-1
Lab ID:	0812175-13

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090035d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.52	0.90	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-O03-1-3
Lab ID:	0812175-14

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 233 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090071d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.3 +/- 0.52	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-O03-1-3

Lab ID: 0812175-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 233 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090071d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.61	0.83	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M06-0-1

Lab ID: 0812175-15

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 173 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090068d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.29	0.47	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M06-0-1

Lab ID: 0812175-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 173 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090068d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.45	0.90	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M06-1-3

Lab ID: 0812175-16

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 195 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.0 +/- 0.28	0.52	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-M06-1-3
Lab ID:	0812175-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 195 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.64	1.2	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-02-0-1

Lab ID: 0812175-17

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090069d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.85	1.6	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-N08-0-1
Lab ID:	0812175-18

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 194 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090036d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.31	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-N08-0-1
Lab ID:	0812175-18

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 194 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090036d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.47	0.72	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-N08-1-3
Lab ID:	0812175-19

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 88.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090059d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.0 +/- 0.80	0.96	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-N08-5-7

Lab ID: 0812175-20

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 99.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090084d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.78	1.2	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1



ALS Paragon



Isotopic Uranium Case Narrative


Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812175

1. This report consists of the analytical results for 20 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to potential matrix interference, a reduce aliquot of ~1 g was taken on all samples. To ensure the proper oxidation state of Pu and to prevent bleed-through, 3 drops of NaNO₂ were added to all samples.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 01/23/09.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

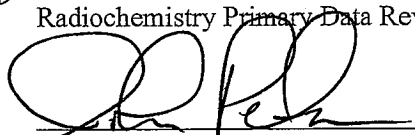


The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



Linda Arend
Radiochemistry Primary Data Reviewer

01/29/09
Date



Radiochemistry Final Data Reviewer

1/29/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812175

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-03-0-1	0812175-1		SOIL	14-Jul-08	9:00
CP-JS-03-1-3	0812175-2		SOIL	14-Jul-08	9:00
CP-JS-03-5-7	0812175-3		SOIL	14-Jul-08	9:07
CP-M04-5-5.4	0812175-4		SOIL	11-Jul-08	10:15
E-JS-02-0-1	0812175-5		SOIL	14-Jul-08	10:33
E-JS-02-1-3	0812175-6		SOIL	14-Jul-08	10:33
E-JS-01-0-1	0812175-7		SOIL	14-Jul-08	10:58
E-JS-01-1-3	0812175-8		SOIL	14-Jul-08	10:58
E-JS-01-5-7	0812175-9		SOIL	14-Jul-08	11:11
EV-JS-01-0-1	0812175-10		SOIL	14-Jul-08	13:52
EV-JS-01-1-3	0812175-11		SOIL	14-Jul-08	13:52
CP-M04-1-2.5	0812175-12		SOIL	11-Jul-08	9:57
CP-O03-0-1	0812175-13		SOIL	11-Jul-08	10:52
CP-O03-1-3	0812175-14		SOIL	11-Jul-08	10:52
CP-M06-0-1	0812175-15		SOIL	11-Jul-08	12:56
CP-M06-1-3	0812175-16		SOIL	11-Jul-08	12:56
CP-JS-02-0-1	0812175-17		SOIL	11-Jul-08	13:20
CP-N08-0-1	0812175-18		SOIL	11-Jul-08	13:55
CP-N08-1-3	0812175-19		SOIL	11-Jul-08	13:55
CP-N08-5-7	0812175-20		SOIL	11-Jul-08	14:00



Paragon Analytics
A Division of DataChem Laboratories, Inc.
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID)

Chain-of-Custody Date 12/15/08 Page 1 of 2

0812175

Project Name/No.: FM-VRP
Sampler(s): K. Walsh

Report To: Steven Vaughn
Phone: (520) 407 2843

Fax:

E-mail: steven_vaughn@u5corp.com

Company: Freepoint MacMoran

Address: 6200 W. Duval Ave Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCL, etc.)	No. of Containers
CP-JS-03-0-1	7/14/08	900	1	S	n/a	1
CP-JS-03-1-3	7/14/08	900	2	S	n/a	1
CP-JS-03-5-7	7/14/08	907	3	S	n/a	1
CP-M04-5-5-4	7/14/08	1015	4	S	n/a	1
E-JS-02-0-1	7/14/08	1033	5	S	n/a	1
E-JS-02-1-3	7/14/08	1033	6	S	n/a	1
E-JS-01-0-1	7/14/08	1058	7	S	n/a	1
E-JS-01-1-3	7/14/08	1058	8	S	n/a	1
E-JS-01-5-7	7/14/08	1111	9	S	n/a	1
EN-JS-01-0-1	7/14/08	1357	10	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Comments:

Order No. C568VT

Trk # 797187199760

Turnaround (circle one)	Standard or Rush (Due Date 60 days or Return to Client)
✓ 3	✓ Standard
✓ 4	✓ Standard
✓ 5	✓ Standard
✓ 6	✓ Standard
✓ 7	✓ Standard
✓ 8	✓ Standard
✓ 9	✓ Standard
✓ 10	✓ Standard
✓ 11	✓ Standard
✓ 12	✓ Standard
✓ 13	✓ Standard
✓ 14	✓ Standard
✓ 15	✓ Standard
✓ 16	✓ Standard
✓ 17	✓ Standard
✓ 18	✓ Standard
✓ 19	✓ Standard
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✓ 92	✓ Standard
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✓ 97	✓ Standard
✓ 98	✓ Standard
✓ 99	✓ Standard
✓ 100	✓ Standard

VOCs	SW8260B	BTEX (only)	SW8021B	SVOCs	SW8270C	OC Pesticides	SW8081A	PCBs	SW8082	Herbicides	SW8151A	Explosives	SW8330	TCLP Organics	SW1311	SW8260B 8270C 8081A 8151A	TCLP Metals	SW1311 Hg	SW6010B 7470	Total Metals by ICP Hg	SW6010B 7470 7471 E200.7	Dissolved Metals by ICP Hg	SW6010B 7470 E200.7	Total Metals by ICP/MS	SW6020A E200.8	Dissolved Metals by ICP/MS	SW6020A E200.8	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	Total E160.3 TDS E160.1 TSS E160.2	pH	SW9040B SW9045C	TPH	SW8015B GRO DRO (circle one or both)	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Aluminum Isotopes	234, 235, 238
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Relinquished By: <u>Kevin Walsh</u> Signature _____ Printed Name _____ Date <u>12/15/08</u> Time <u>1600</u> Company <u>URS</u>	Relinquished By: _____ Signature _____ Printed Name _____ Date _____ Time _____ Company _____
(1)	(2)

Received By: <u>James Miller</u>	Received By: _____
Signature _____	Signature _____
Printed Name <u>Lara Jordan</u>	Printed Name _____
Date <u>12/17/08</u> Time <u>1045</u>	Date _____ Time _____
Company <u>ALS Paramedic</u>	Company _____
(1)	(2)

Form 202r6.xls (6/16/06)



Paragon Analyticals

A Division of DataChem Laboratories, Inc.

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID) 0812175 Date 12/15/08 Page 2 of 2 Originator: Retain pink copy!

Chain-of-Custody

Project Name/No.: PM1-VRT Sampler(s): K. Walsh Turnaround (circle one) Standard or Rush (Due 60 day) Date 12/15/08 or Return to Client

Report To: Steven Vaughan

Phone: (520) 407 2845

Fax:

E-mail: steven_vanvaughan@paragoncorp.com

Company: Freeport McMoran

Address: 6200 W Duval Mine Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers	VOCS													Inorganic Anions													Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
							BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No: 0508VT

Trk# 797187199760

Relinquished By:	(1)	Relinquished By:	(2)
Signature	<u>K. Walsh</u>	Signature	
Printed Name	<u>Kevin Walsh</u>	Printed Name	
Date	<u>12/15/08</u>	Date	
Time	<u>1600</u>	Time	
Company	<u>ALS</u>	Company	
Received By:	(1)	Received By:	(2)
Signature	<u>Anna J. Wilson</u>	Signature	
Printed Name	<u>Anna J. Wilson</u>	Printed Name	
Date	<u>12/17/08</u>	Date	
Time	<u>1045</u>	Time	
Company	<u>ALS Paragon</u>	Company	

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812175
Initials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #19 and 20 (CP-N08-1-3 and CP-N08-5-7) The samples have ID labels and also have all the ID information written on the lids. For samples 19 and 20, The label for sample 19 matches the lid on sample 20; the label for sample 20 matches the lid on 19. use bottle labels

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: emailProject Manager Signature / Date: [Signature] 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111268/28/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****
 Dims: 22 X 17 X 15 IN

14.1

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812175

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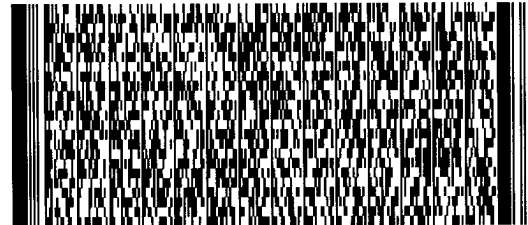
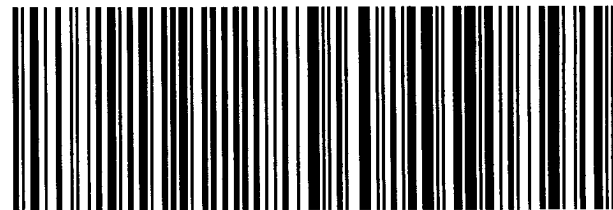
WED - 17DEC AA
 STANDARD OVERNIGHT

MPS# 7971 8719 9760
 0263

Mstr# 7971 8719 9690 0201

80524
 CO-US
 DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090114-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jan-09

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.028 +/- 0.029	0.044	0.1	U
15117-96-1	U-235	0.0027 +/- 0.024	0.042	0.1	U
7440-61-1	U-238	-0.0014 +/- 0.021	0.051	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	4.09	pCi/g	90.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812175-1

Date Printed: Thursday, January 29, 2009

ALS Paragon
LIMS Version: 6.238A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090114-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jan-09

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.22 +/- 0.747	0.0563	4.32	97.7	82 - 122	P
7440-61-1	U-238	4.60 +/- 0.810	0.0514	4.48	103	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	3.93	pCi/g	87.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812175-1

Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-5-7

Lab ID: 0812175-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	3.6 +/- 0.65	3.2 +/- 0.59	0.45	2.13	
15117-96-1	U-235	0.20 +/- 0.081	0.21 +/- 0.082	0.04	2.13	
7440-61-1	U-238	3.6 +/- 0.64	3.2 +/- 0.59	0.36	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-1-2.5
Lab ID: 0812175-12DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.9 +/- 0.37	1.9 +/- 0.38	0.15	2.13	
15117-96-1	U-235	0.069 +/- 0.047	0.054 +/- 0.039	0.25	2.13	LT
7440-61-1	U-238	1.8 +/- 0.35	1.7 +/- 0.35	0.04	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-03-0-1
Lab ID:	0812175-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.49	0.036	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.048	0.1	
7440-61-1	U-238	2.7 +/- 0.50	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.79	pCi/g	84.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-03-1-3
Lab ID:	0812175-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.42	0.027	0.1	
15117-96-1	U-235	0.072 +/- 0.044	0.032	0.1	LT
7440-61-1	U-238	2.2 +/- 0.42	0.033	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.510	4.17	pCi/g	92.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-03-5-7
Lab ID:	0812175-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.6 +/- 0.65	0.030	0.1	
15117-96-1	U-235	0.20 +/- 0.081	0.042	0.1	
7440-61-1	U-238	3.6 +/- 0.64	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.491	3.77	pCi/g	84.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-5-7

Lab ID: 0812175-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.2 +/- 0.59	0.030	0.1	
15117-96-1	U-235	0.21 +/- 0.082	0.035	0.1	
7440-61-1	U-238	3.2 +/- 0.59	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.489	3.79	pCi/g	84.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-M04-5-5.4
Lab ID:	0812175-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.8 +/- 0.68	0.034	0.1	
15117-96-1	U-235	0.20 +/- 0.079	0.017	0.1	
7440-61-1	U-238	3.8 +/- 0.68	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.499	3.84	pCi/g	85.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	E-JS-02-0-1
Lab ID:	0812175-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.41	0.029	0.1	
15117-96-1	U-235	0.12 +/- 0.061	0.018	0.1	
7440-61-1	U-238	2.3 +/- 0.44	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.513	3.88	pCi/g	86.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	E-JS-02-1-3
Lab ID:	0812175-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.6 +/- 0.83	0.046	0.1	
15117-96-1	U-235	0.31 +/- 0.10	0.019	0.1	
7440-61-1	U-238	4.9 +/- 0.87	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.66	pCi/g	81.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-0-1	Sample Matrix: SOIL	Prep Batch: AS090114-1	Final Aliquot: 1.00 g
Lab ID: 0812175-7	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090114-1-1	Prep Basis: Dry Weight
	Date Collected: 14-Jul-08	Run ID: AS090114-1A	Moisture(%): NA
	Date Prepared: 14-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.060	0.1	
15117-96-1	U-235	0.097 +/- 0.055	0.051	0.1	LT
7440-61-1	U-238	1.6 +/- 0.33	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.500	3.92	pCi/g	87.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	E-JS-01-1-3
Lab ID:	0812175-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.088	0.1	
15117-96-1	U-235	0.092 +/- 0.062	0.074	0.1	LT
7440-61-1	U-238	2.5 +/- 0.48	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	3.17	pCi/g	70.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-5-7	Sample Matrix: SOIL	Prep Batch: AS090114-1	Final Aliquot: 1.01 g
Lab ID: 0812175-9	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090114-1-1	Prep Basis: Dry Weight
	Date Collected: 14-Jul-08	Run ID: AS090114-1A	Moisture(%): NA
	Date Prepared: 14-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.47	0.090	0.1	
15117-96-1	U-235	0.072 +/- 0.055	0.063	0.1	LT
7440-61-1	U-238	2.5 +/- 0.51	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	3.04	pCi/g	67.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-0-1	Sample Matrix: SOIL	Prep Batch: AS090114-1	Final Aliquot: 1.00 g
Lab ID: 0812175-10	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090114-1-1	Prep Basis: Dry Weight
	Date Collected: 14-Jul-08	Run ID: AS090114-1A	Moisture(%): NA
	Date Prepared: 14-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.8 +/- 0.68	0.051	0.1	
15117-96-1	U-235	0.27 +/- 0.098	0.019	0.1	
7440-61-1	U-238	4.0 +/- 0.72	0.051	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.502	3.81	pCi/g	84.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-01-1-3
Lab ID:	0812175-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.46	0.048	0.1	
15117-96-1	U-235	0.13 +/- 0.063	0.035	0.1	
7440-61-1	U-238	2.6 +/- 0.48	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.506	4.23	pCi/g	94.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-M04-1-2.5
Lab ID:	0812175-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.067	0.1	
15117-96-1	U-235	0.069 +/- 0.047	0.049	0.1	LT
7440-61-1	U-238	1.8 +/- 0.35	0.055	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.92	pCi/g	87.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-1-2.5

Lab ID: 0812175-12DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.036	0.1	
15117-96-1	U-235	0.054 +/- 0.039	0.018	0.1	LT
7440-61-1	U-238	1.7 +/- 0.35	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.479	4.00	pCi/g	89.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-O03-0-1	Sample Matrix: SOIL	Prep Batch: AS090114-1	Final Aliquot: 1.01 g
Lab ID: 0812175-13	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090114-1-1	Prep Basis: Dry Weight
	Date Collected: 11-Jul-08	Run ID: AS090114-1A	Moisture(%): NA
	Date Prepared: 14-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.49	0.072	0.1	
15117-96-1	U-235	0.14 +/- 0.069	0.043	0.1	
7440-61-1	U-238	2.7 +/- 0.52	0.075	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.56	pCi/g	79.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-003-1-3
Lab ID:	0812175-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.1 +/- 0.56	0.072	0.1	
15117-96-1	U-235	0.23 +/- 0.085	0.044	0.1	
7440-61-1	U-238	3.1 +/- 0.56	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.484	4.02	pCi/g	89.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-M06-0-1
Lab ID:	0812175-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.1 +/- 0.24	0.065	0.1	
15117-96-1	U-235	0.063 +/- 0.046	0.056	0.1	LT
7440-61-1	U-238	1.1 +/- 0.23	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.98	pCi/g	88.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-M06-1-3
Lab ID:	0812175-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.88 +/- 0.20	0.034	0.1	
15117-96-1	U-235	0.056 +/- 0.040	0.034	0.1	LT
7440-61-1	U-238	1.0 +/- 0.22	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.502	4.28	pCi/g	95.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-02-0-1
Lab ID:	0812175-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	12 +/- 2.0	0.017	0.1	
15117-96-1	U-235	0.74 +/- 0.19	0.046	0.1	
7440-61-1	U-238	12 +/- 2.0	0.017	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.518	3.78	pCi/g	83.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-N08-0-1
Lab ID:	0812175-18

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.043	0.1	
15117-96-1	U-235	0.089 +/- 0.053	0.037	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.518	3.97	pCi/g	88.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-N08-1-3
Lab ID:	0812175-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.9 +/- 0.70	0.050	0.1	
15117-96-1	U-235	0.20 +/- 0.082	0.036	0.1	
7440-61-1	U-238	4.0 +/- 0.71	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.509	3.90	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-N08-5-7
Lab ID:	0812175-20

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.0 +/- 0.72	0.058	0.1	
15117-96-1	U-235	0.18 +/- 0.079	0.038	0.1	
7440-61-1	U-238	4.3 +/- 0.78	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.489	3.68	pCi/g	81.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812175

1. This report consists of the analytical results for two soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in these samples.
3. The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analyses were completed on 01/29/09.
4. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil samples from this work order were initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. ICP-AES measurement of barium concentrations prior to chemical separation for samples 0812175-8 and -11 showed concentrations less than the amount known to have been added to the samples in the form of barium carrier. To avoid a low bias in the final analytical results the known concentration of the carrier was used in chemical yield calculations in lieu of the pre-separation measurement.
7. No further anomalous situations were noted during the preparation and analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Lara Orban

Radiochemistry Primary Data Reviewer

2/13/09
Date

Radiochemistry Final Data Reviewer

02/16/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812175

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-03-0-1	0812175-1		SOIL	14-Jul-08	9:00
CP-JS-03-1-3	0812175-2		SOIL	14-Jul-08	9:00
CP-JS-03-5-7	0812175-3		SOIL	14-Jul-08	9:07
CP-M04-5-5.4	0812175-4		SOIL	11-Jul-08	10:15
E-JS-02-0-1	0812175-5		SOIL	14-Jul-08	10:33
E-JS-02-1-3	0812175-6		SOIL	14-Jul-08	10:33
E-JS-01-0-1	0812175-7		SOIL	14-Jul-08	10:58
E-JS-01-1-3	0812175-8		SOIL	14-Jul-08	10:58
E-JS-01-5-7	0812175-9		SOIL	14-Jul-08	11:11
EV-JS-01-0-1	0812175-10		SOIL	14-Jul-08	13:52
EV-JS-01-1-3	0812175-11		SOIL	14-Jul-08	13:52
CP-M04-1-2.5	0812175-12		SOIL	11-Jul-08	9:57
CP-O03-0-1	0812175-13		SOIL	11-Jul-08	10:52
CP-O03-1-3	0812175-14		SOIL	11-Jul-08	10:52
CP-M06-0-1	0812175-15		SOIL	11-Jul-08	12:56
CP-M06-1-3	0812175-16		SOIL	11-Jul-08	12:56
CP-JS-02-0-1	0812175-17		SOIL	11-Jul-08	13:20
CP-N08-0-1	0812175-18		SOIL	11-Jul-08	13:55
CP-N08-1-3	0812175-19		SOIL	11-Jul-08	13:55
CP-N08-5-7	0812175-20		SOIL	11-Jul-08	14:00

Resident Name/No: EM1-V2D Turnaround (circle one) Standard Rush (Due _____) Dispose: 60 days or Return to Client

Report To: Steven Vaughn
Phone: (520) 407 2843

Fax:

E-mail: steven_vaughn@uscorp.com

Company: Freepoint Mac.Morran

Address: 6200 W. Duval Ave. Ed.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers	VOCS												OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadiSr)	Gamma Isotopes	Radon 222	Aluminum Isotope																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Relinquished By: <u>Kenn Wal</u>	Relinquished By: _____
Signature _____	Signature _____
Printed Name <u>Kevin Walsh</u>	Printed Name _____
Date <u>12/15/08</u> Time <u>1600</u>	Date _____ Time _____
Company <u>URS</u>	Company _____

<p>Received By: <u><i>Tara Jordan</i></u></p> <p>Signature _____</p> <p>Printed Name <u><i>Tara Jordan</i></u></p> <p>Date <u><i>12/1/08</i></u> Time <u><i>1045</i></u></p> <p>Company <u><i>ALS Paragon</i></u></p>	(1)
<p>Received By: _____</p> <p>Signature _____</p> <p>Printed Name _____</p> <p>Date _____ Time _____</p> <p>Company _____</p>	(2)

Order No. 0508VT

Trk # 797187199760



Paragon Analyticals

A Division of DataChem Laboratories, Inc.

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID) 0812175 Date 12/15/08 Page 2 of 2 Originator: Retain pink copy!

Chain-of-Custody

Project Name/No.: PM1-VRT Sampler(s): K. Walsh Turnaround (circle one) Standard or Rush (Due 60 day) Date 12/15/08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407 2845

Fax:

E-mail: steven_v Vaughn@dcslab.com

Company: Freeport Mc Moran

Address: 6200 W Duval Mine Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers	VOCS													Inorganic Anions													Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
							BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No: 0508VT

Trk# 797187199760

Relinquished By:	(1)	Relinquished By:	(2)
Signature	<u>K. Walsh</u>	Signature	
Printed Name	<u>Kevin Walsh</u>	Printed Name	
Date	<u>12/15/08</u>	Date	
Time	<u>1600</u>	Time	
Company	<u>ALS</u>	Company	
Received By:	(1)	Received By:	(2)
Signature	<u>Anna J. Wilson</u>	Signature	
Printed Name	<u>Anna J. Wilson</u>	Printed Name	
Date	<u>12/17/08</u>	Date	
Time	<u>1045</u>	Time	
Company	<u>ALS Paragon</u>	Company	

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812175
Initials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #19 and 20 (CP-N08-1-3 and CP-N08-5-7) The samples have ID labels and also have all the ID information written on the lids. For samples 19 and 20, The label for sample 19 matches the lid on sample 20; the label for sample 20 matches the lid on 19. use bottle labels

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: emailProject Manager Signature / Date: [Signature] 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111268/28/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.1

SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

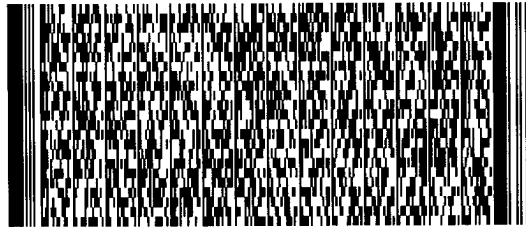
Ft. Collins, CO 80524

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812175



2 of 4

WED - 17DEC

AA

MPS# 7971 8719 9760
 0263

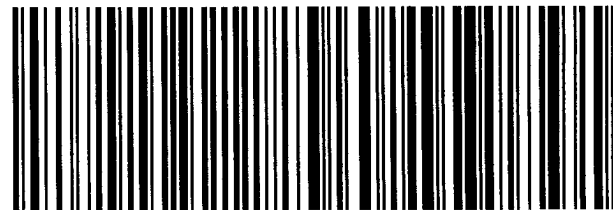
STANDARD OVERNIGHT

Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812175-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812175-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Field ID: E-JS-01-1-3	Sample Matrix: SOIL	Prep Batch: RA090120-2	Final Aliquot: 0.504 g
Lab ID: 0812175-8	Prep SOP: PAI 746 Rev 8	QCBatchID: RA090120-2-1	Prep Basis: Dry Weight
	Date Collected: 14-Jul-08	Run ID: RA090120-2A	Moisture(%): NA
	Date Prepared: 20-Jan-09	Count Time: 250 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 1.7	2.5	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	31600	ug	89.8	40 - 110 %	
YTTRIUM	8713	6210	ug	71.3	40 - 110 %	
Total				64.0	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812175-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-01-1-3
Lab ID:	0812175-11

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 14-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.507 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.8 +/- 1.7	2.5	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	31900	ug	90.6	40 - 110 %	
YTTRIUM	8713	5840	ug	67.0	40 - 110 %	
Total				60.8	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812175-1



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative


Freeport McMoRan Sierrita

FMI-VRP

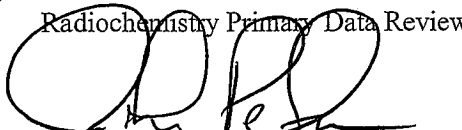
Work Order Number: 0812175

1. This report consists of the analytical results for 13 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared and analyzed according to procedures SOP783R8 and SOP336R0. The analyses were completed on 02/27/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. The radiometric recovery for the matrix spike of sample 0812175-7 is above the upper control limit of 126% at 171%, as indicated with an "N" qualifier on the final report. All other quality control criteria have been met. ALS does not control on matrix spike recovery. The results for this sample are considered an estimated value and are included in this data package.
5. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Linda Arend
Radiochemistry Primary Data Reviewer

03/06/09
Date


Radiochemistry Final Data Reviewer

03/06/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812175

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-03-0-1	0812175-1		SOIL	14-Jul-08	9:00
CP-JS-03-1-3	0812175-2		SOIL	14-Jul-08	9:00
CP-JS-03-5-7	0812175-3		SOIL	14-Jul-08	9:07
CP-M04-5-5.4	0812175-4		SOIL	11-Jul-08	10:15
E-JS-02-0-1	0812175-5		SOIL	14-Jul-08	10:33
E-JS-02-1-3	0812175-6		SOIL	14-Jul-08	10:33
E-JS-01-0-1	0812175-7		SOIL	14-Jul-08	10:58
E-JS-01-1-3	0812175-8		SOIL	14-Jul-08	10:58
E-JS-01-5-7	0812175-9		SOIL	14-Jul-08	11:11
EV-JS-01-0-1	0812175-10		SOIL	14-Jul-08	13:52
EV-JS-01-1-3	0812175-11		SOIL	14-Jul-08	13:52
CP-M04-1-2.5	0812175-12		SOIL	11-Jul-08	9:57
CP-O03-0-1	0812175-13		SOIL	11-Jul-08	10:52
CP-O03-1-3	0812175-14		SOIL	11-Jul-08	10:52
CP-M06-0-1	0812175-15		SOIL	11-Jul-08	12:56
CP-M06-1-3	0812175-16		SOIL	11-Jul-08	12:56
CP-JS-02-0-1	0812175-17		SOIL	11-Jul-08	13:20
CP-N08-0-1	0812175-18		SOIL	11-Jul-08	13:55
CP-N08-1-3	0812175-19		SOIL	11-Jul-08	13:55
CP-N08-5-7	0812175-20		SOIL	11-Jul-08	14:00



Paragon Analytics
A Division of DataChem Laboratories, Inc.
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID)

Chain-of-Custody

Originator: Retain pink copy!

0812175

Project Name/No.: FM1-VZP

Turnaround (circle one) Standard or Rush (Due

) Dispose: Date 60 days or Return to Client

Report To: Steven Vaughn
Phone: (520) 407 2843

Fax:

E-mail: steven_vaughn@u5corp.com

Company: Freepoint MacMoran

Address: 6200 W. Duval Ave. R.1

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-JS-03-0-1	7/14/08	900	1	S	n/a	1
CP-JS-03-1-3	7/14/08	900	2	S	n/a	1
CP-JS-03-5-7	7/14/08	907	3	S	n/a	1
CP-M04-5-5-4	7/14/08	1015	4	S	n/a	1
E-JS-02-0-1	7/14/08	1033	5	S	n/a	1
E-JS-02-1-3	7/14/08	1033	6	S	n/a	1
E-JS-01-0-1	7/14/08	1058	7	S	n/a	1
E-JS-01-1-3	7/14/08	1058	8	S	n/a	1
E-JS-01-5-7	7/14/08	1111	9	S	n/a	1
EN-JS-01-0-1	7/14/08	1352	10	S	n/a	1

* **Time Zone:** EST CST MST PST **Matrix Key:** O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. C568VT

Trk # 797187199760

3

Form 202r6.xls (6/16/06)

Relinquished By: <u>Kevin Walsh</u>	(1)	Relinquished By:	(2)
Signature <u>Kevin Walsh</u>		Signature _____	
Printed Name <u>Kevin Walsh</u>		Printed Name _____	
Date <u>12/15/08</u> Time <u>1600</u>		Date _____ Time _____	
Company <u>URS</u>		Company _____	
Received By: <u>Lara Jordan</u>	(1)	Received By:	(2)
Signature <u>Lara Jordan</u>		Signature _____	
Printed Name <u>Lara Jordan</u>		Printed Name _____	
Date <u>12/17/08</u> Time <u>1045</u>		Date _____ Time _____	
Company <u>ALS Paragon</u>		Company _____	



225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Chain-of-Custody Date 12/15/08 Page 2 of 2

Originator: Retain pink copy!

0812175

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Comments:

Order No. 0508VT

Tick# 797187199760

4

Form 202r6.xls (6/16/06)

Relinquished By: <u>Kevin Walsh</u> Signature _____ Printed Name <u>Kevin Walsh</u> Date <u>12/15/08</u> Time <u>1600</u> Company _____	Relinquished By: _____ Signature _____ Printed Name _____ Date _____ Time _____ Company _____
Received By: <u>Anna Johnson</u> Signature _____ Printed Name <u>Anna Johnson</u> Date <u>12/17/08</u> Time <u>1045</u> Company <u>ALS Paramedics</u>	Received By: _____ Signature _____ Printed Name _____ Date _____ Time _____ Company _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812175
Initials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u> NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	YES NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<u>YES</u>	YES NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #19 and 20 (CP-N08-1-3 and CP-N08-5-7) The samples have ID labels and also have all the ID information written on the lids. For samples 19 and 20, The label for sample 19 matches the lid on sample 20; the label for sample 20 matches the lid on 19. use bottle labels

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: emailProject Manager Signature / Date: [Signature] 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111268/28/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.1

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812175

2 of 4

WED - 17DEC

AA

MPS# 7971 8719 9760
 0263

STANDARD OVERNIGHT

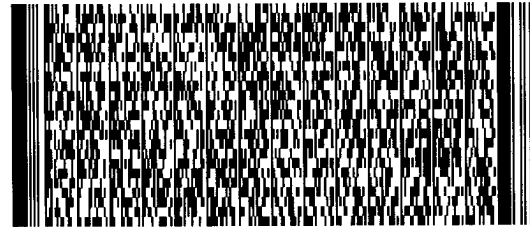
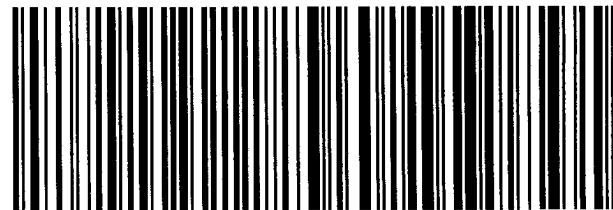
Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-3MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Final Aliquot: 1.02 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.088 +/- 0.11	0.26	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812175-1

Date Printed: Friday, March 06, 2009

ALS Paragon
LIMS Version: 6.249A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Final Aliquot: 1.02 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	30.4 +/- 5.67	0.349	43.9	69.2	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812175-1

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-0-1

Lab ID: 0812175-7MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 14-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	77.4	1.3	0.503	44.5	171	57 - 126	N

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812175-1

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-0-1
Lab ID: 0812175-7DUP

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.3 +/- 0.44	1.5 +/- 0.52	0.36	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-03-0-1	Sample Matrix: SOIL	Prep Batch: RE090203-3	Final Aliquot: 1.03 g
Lab ID: 0812175-1	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-3-1	Prep Basis: Dry Weight
	Date Collected: 14-Jul-08	Run ID: RE090203-3A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.66	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-JS-03-1-3
Lab ID:	0812175-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.60	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-JS-03-5-7
Lab ID:	0812175-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.3 +/- 1.2	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	E-JS-02-0-1
Lab ID:	0812175-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.52	0.063	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	E-JS-02-1-3
Lab ID:	0812175-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.8 +/- 1.1	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	E-JS-01-0-1
Lab ID:	0812175-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.44	0.24	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	E-JS-01-0-1
Lab ID:	0812175-7DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 14-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.52	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	E-JS-01-1-3
Lab ID:	0812175-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.54	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	E-JS-01-5-7
Lab ID:	0812175-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.61	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EV-JS-01-0-1
Lab ID:	0812175-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.44 +/- 0.23	0.17	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EV-JS-01-1-3	Sample Matrix: SOIL	Prep Batch: RE090203-3	Final Aliquot: 1.02 g
Lab ID: 0812175-11	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-3-1	Prep Basis: Dry Weight
	Date Collected: 14-Jul-08	Run ID: RE090203-3A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.85	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-02-0-1	Sample Matrix: SOIL	Prep Batch: RE090203-3	Final Aliquot: 1.00 g
Lab ID: 0812175-17	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-3-1	Prep Basis: Dry Weight
	Date Collected: 11-Jul-08	Run ID: RE090203-3A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.80	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-N08-1-3	Sample Matrix: SOIL	Prep Batch: RE090203-3	Final Aliquot: 1.04 g
Lab ID: 0812175-19	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-3-1	Prep Basis: Dry Weight
	Date Collected: 11-Jul-08	Run ID: RE090203-3A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.1 +/- 0.94	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-N08-5-7
Lab ID:	0812175-20

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.59	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1



March 6, 2009

Mr. Billy Doris
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-176
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Doris:

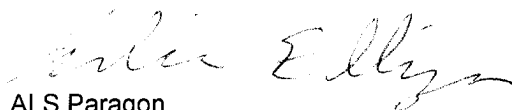
Eighteen soil samples were received from Freeport McMoRan Sierrita on December 17, 2008. The samples were scheduled for the following analyses.

Isotopic Uranium	pages 1-31
Gamma spectroscopy	pages 1-46
226Radium by EPA Method 903.1 (m)	pages 1-30

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/mh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812176

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
OD-SD-02-1.5-30	0812176-1		SOIL	28-Jul-08	11:11
OD-SD-04-0-1.5	0812176-2		SOIL	28-Jul-08	12:34
OD-SD-04-1.5-3.0	0812176-3		SOIL	28-Jul-08	12:34
OD-SD-03-0-1.5	0812176-4		SOIL	28-Jul-08	13:00
OD-SD-03-1.5-3.0	0812176-5		SOIL	28-Jul-08	13:00
CP-SD-07-1.5-3.0	0812176-6		SOIL	23-Jul-08	10:47
CP-P12-0-1	0812176-7		SOIL	23-Jul-08	11:03
OD-SD-05-0-1.5	0812176-8		SOIL	29-Jul-08	8:16
OD-SD-01-0-1.5	0812176-9		SOIL	28-Jul-08	10:58
OD-SD-01-1.5-3.0	0812176-10		SOIL	28-Jul-08	10:58
OD-SD-06-0-1.5	0812176-11		SOIL	29-Jul-08	8:30
OD-SD-06-1.5-3.0	0812176-12		SOIL	29-Jul-08	8:30
OD-JS-01-0-1	0812176-13		SOIL	29-Jul-08	9:19
OD-JS-02-0-1	0812176-14		SOIL	29-Jul-08	9:57
OD-JS-02-1-3	0812176-15		SOIL	29-Jul-08	9:57
EM-C22-0-1	0812176-16		SOIL	29-Jul-08	12:18
EM-E24-0-1	0812176-17		SOIL	29-Jul-08	13:21
EM-E24-1-3	0812176-18		SOIL	29-Jul-08	13:21



PARAGON
ANALYTICS

ALS Paragon

ALS Laboratory Group



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812176

Page 1 of 2

Date: 12/16/08

Project Name/No.: FMI-VZP		Sampler(s): K. Walsh		Turnaround (circle one): Standard or Rush (Due _____)		Dispose: Date 60 day or Return to Client _____			
Report To: Steven Vaughan		E-mail: steven_vanughn@urcorp.com		Company: Freeport Mc Moran		Address: 6200 W Duval Mue Rd Green Valley, AZ 85614			
Phone: (520) 407-2845		Fax:							
Circle method (right); provide additional information as needed (comments).		Sample ID		Date	Time *	Lab ID	Matrix	Preservative	No. of Containers
		0D-SD-02-1.5-3.0	7/22/08	1111	1	5	n/a	1	
		0D-SD-04-0-1.5	7/28/08	1234	2	5	n/a	1	
		0D-SD-04-1.5-3.0	7/28/08	1234	3	5	n/a	1	
		0D-SD-03-0-1.5	7/28/08	1300	4	5	n/a	1	
		0D-SD-03-1.5-3.0	7/28/08	1300	5	5	n/a	1	
		0P-SD-07-1.5-3.0	7/23/08	1047	6	5	n/a	1	
		0P-T12-0-1	7/23/08	1103	7	5	n/a	1	
		0D-SD-05-0-1.5	7/29/08	8168	8	5	n/a	1	
		0P-SD-08-0-1.5	7/28/08	09103	9	5	n/a	1	
		0D-SD-01-0-1.5	7/28/08	10583	10	5	n/a	1	
		* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
		Comments:							
		Order No. 0548 VT							
		Tick # 7961 9066 6706							
		Relinquished By: (1) Signature: K. Walsh Printed Name: Kevin Walsh Date: 12/16/08 Time: 1600 Company: URS							
		Relinquished By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____							
		Received By: (1) Signature: _____ Printed Name: _____ Date: 12/17/08 Time: 1045 Company: ALS Paragon							
		Received By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____							



PARAGON
ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID 0812176

Date: 12-16-08

Page 2 of 2

Project Name/No.: FM1-VRP	Sampler(s): K. Walsh	Turnaround (circle one): Standard	or Rush (Due)	Disposed Date 60 day	or Return to Client	
Report To: Steven Vaughn						
Phone: (520) 407-2845						
Fax:						
E-mail: steven_vaughn@uriscorp.com						
Company: Freeport McMoran						
Address: 6200 W Duval Mine Rd.						
Green Valley, AZ 85614						
Circle method (right); provide additional information as needed (comments).						
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
01-SD-01-15-3-0	7/28/08	1058	11	S	n/a	1
01-SD-06-0-1-5	7/29/08	0830	12	S	n/a	1
01-SD-06-15-3-0	7/29/08	0830	13	S	n/a	1
01-JS-01-0-1	7/29/08	0919	14	S	n/a	1
01-JS-02-0-1	7/29/08	0957	15	S	n/a	1
01-JS-02-1-3	7/29/08	0957	16	S	n/a	1
EM-C22-0-1	7/29/08	1218	17	S	n/a	1
EM-C22-5-7	7/29/08	1223	18	S	n/a	1
EM-E24-0-1	7/29/08	1321	19	S	n/a	1
EM-E24-1-3	7/29/08	1321	20	S	n/a	1
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter						
Comments:						
Order No. 0508 VT						
Trk # 79619066 6706						
Relinquished By: (1) Signature: Kevin Walsh Printed Name: Kevin Walsh Date: 12/16/08 Time: 1600 Company: URS						
Relinquished By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____						
Received By: (1) Signature: Lara J. Orban Printed Name: Lara J. Orban Date: 12/17/08 Time: 1045 Company: ALS Paragon						
Received By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____						

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812176
Initials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u> YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u> YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u> YES	NO
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<u>NO</u> *
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<u>N/A</u> YES	NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u> YES	NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u> YES	NO
17. Were the samples shipped on ice?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u> YES	<u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples CP-SD-08-0-1.5 and EM-C22-5-7 were received broken. PM notified.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: [Signature] 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/28/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.1

Delivery Address Bar Code



0812176

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

3 of 4

WED - 17DEC

AA

MPS# 7961 9066 6706
 0263

STANDARD OVERNIGHT

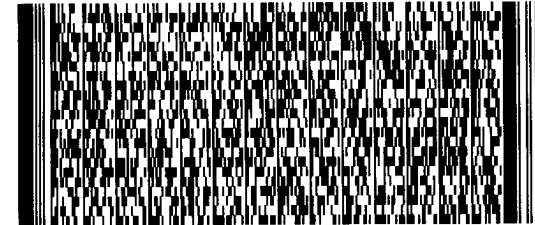
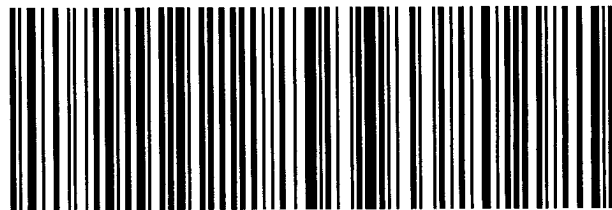
Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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March 6, 2009

Mr. Steven Vaughn
URS Corporation
333 E Wetmore Rd., Suite 400
Tucson, AZ 85614

Re: ALS Paragon Workorder:	08-12-176
Client Project Name:	FMI-VRP
Client Project Number:	None Submitted

Dear Mr. Vaughn:

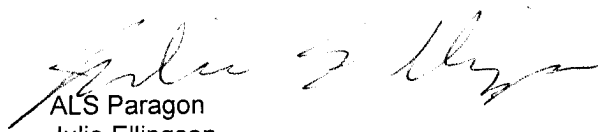
Eighteen soil samples were received from Freeport McMoRan Sierrita on December 17, 2008. The samples were scheduled for the following analyses.

Isotopic Uranium	pages 1-31
Gamma spectroscopy	pages 1-46
226Radium by EPA Method 903.1 (m)	pages 1-30

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,


ALS Paragon
Julie Ellingson
Project Manager

JME/mh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812176

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
OD-SD-02-1.5-30	0812176-1		SOIL	28-Jul-08	11:11
OD-SD-04-0-1.5	0812176-2		SOIL	28-Jul-08	12:34
OD-SD-04-1.5-3.0	0812176-3		SOIL	28-Jul-08	12:34
OD-SD-03-0-1.5	0812176-4		SOIL	28-Jul-08	13:00
OD-SD-03-1.5-3.0	0812176-5		SOIL	28-Jul-08	13:00
CP-SD-07-1.5-3.0	0812176-6		SOIL	23-Jul-08	10:47
CP-P12-0-1	0812176-7		SOIL	23-Jul-08	11:03
OD-SD-05-0-1.5	0812176-8		SOIL	29-Jul-08	8:16
OD-SD-01-0-1.5	0812176-9		SOIL	28-Jul-08	10:58
OD-SD-01-1.5-3.0	0812176-10		SOIL	28-Jul-08	10:58
OD-SD-06-0-1.5	0812176-11		SOIL	29-Jul-08	8:30
OD-SD-06-1.5-3.0	0812176-12		SOIL	29-Jul-08	8:30
OD-JS-01-0-1	0812176-13		SOIL	29-Jul-08	9:19
OD-JS-02-0-1	0812176-14		SOIL	29-Jul-08	9:57
OD-JS-02-1-3	0812176-15		SOIL	29-Jul-08	9:57
EM-C22-0-1	0812176-16		SOIL	29-Jul-08	12:18
EM-E24-0-1	0812176-17		SOIL	29-Jul-08	13:21
EM-E24-1-3	0812176-18		SOIL	29-Jul-08	13:21



**PARAGON
ANALYTICS**

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID **0812176**

Date: **12/16/08** Page **1** of **2**

Project Name/No.: FW1-VZP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due _____) Dispose: Date 60 day or Return to Client _____																																																																																																																																																																																																																																																																																																																																															
Report To: Steven Vaughan Phone: (520) 407-2845 Fax: _____ E-mail: Steven_vanughn@urcorp.com Company: Freeport Mc Moran Address: 6200 W Duval Mine Rd Green Valley, AZ 85614																																																																																																																																																																																																																																																																																																																																															
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*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: **Order No. 0548 VT**

Tick # 7961 9066 6706



PARAGON
ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID 0812176

Date: 12-16-08

Page 2 of 2

Sample ID	Date	Time	Lab ID	Matrix	Preservative	No. of Containers	Project Name/No.	Sampler(s)	Turnaround (circle one):	Standard or Rush (Due)	Disposed Date	Return to Client
01D-SD-01-15-3-0	7/28/08	1058	11	S	n/a	1	FM1-VRP	K. Walsh	Standard	Due	60 day	
01D-SD-06-0-1-5	7/29/08	0830	12	S	n/a	1						
01D-SD-06-15-3-0	7/29/08	0830	13	S	n/a	1						
01D-JS-01-0-1	7/29/08	0919	14	S	n/a	1						
01D-JS-02-0-1	7/29/08	0957	15	S	n/a	1						
01D-JS-02-1-3	7/29/08	0957	16	S	n/a	1						
EM-C22-0-1	7/29/08	1218	17	S	n/a	1						
EM-C22-5-7	7/29/08	1223	18	S	n/a	1						
EM-E24-0-1	7/29/08	1321	19	S	n/a	1						
EM-E24-1-3	7/29/08	1321	20	S	n/a	1						
Circle method (right); provide additional information as needed (comments).												
VOCs							SW8260B					
BTEX (only)							SW8021B					
SVOCs							SW8270C					
OC Pesticides							SW8081A					
PCBs							SW8082					
Herbicides							SW8151A					
Explosives							SW8330					
TCRP Organics							SW8260B 8270C 8081A 8151A					
TCRP Metals							SW6010B 7470					
Total Metals by ICP Hg							SW6010B 7470 7471 E200.7					
Dissolved Metals by ICP/MS							SW6020A E200.8					
Total Metals by ICP/MS							SW6020A E200.8					
Dissolved Metals by ICP/MS							SW6020A E200.8					
Hexavalent Chromium							SW1796A Alkaline Digest? Y / N					
Inorganic Anions							SW9056 E300.0 (specify in comments)					
Solids:							Total E160.3 TDS E160.1 TSS E160.2					
pH							SW9040B SW9045C					
TPH							SW8015B GRO DRO (circle one or both)					
Gross Alpha / Beta							SW9310 E900.0					
Actinides by Paragon SOP							Pu / U / Am / Th / Cm /					
Tritium							E906.0					
Total Alpha-Emitting Radium							SW9315 E903.0					
Radium 226							E903.1					
Radium 228							SW9320 E904.0					
Strontium 90 (Total Radiosr)							D5811-00					
Gamma Isotopes							E901.1					
Radon 222							SM7510Rn					
Uranium Isotopes							234, 235, 238					

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: steven_vaughn@uriscorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Order No. 0508 VT
Trk # 79619066 6706

Relinquished By: (1) Signature: Kevin Walsh
Printed Name: Kevin Walsh
Date: 12/16/08 Time: 1600
Company: URS

Relinquished By: (2) Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

Received By: (1) Signature: Lara J. Orban
Printed Name: Lara J. Orban
Date: 12/17/08 Time: 1045
Company: ALS Paragon

Received By: (2) Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

Form 202r6.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812176
Initials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u> YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u> YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u> YES	NO
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<u>NO</u> *
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<u>N/A</u> YES	NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u> YES	NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u> YES	NO
17. Were the samples shipped on ice?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u> YES	<u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples CP-SD-08-0-1.5 and EM-C22-5-7 were received broken. PM notified.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: [Signature] 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/28/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.1

Delivery Address Bar Code



0812176

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

3 of 4

WED - 17DEC

AA

MPS# 7961 9066 6706
 0263

STANDARD OVERNIGHT

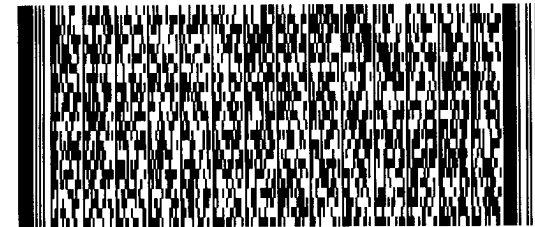
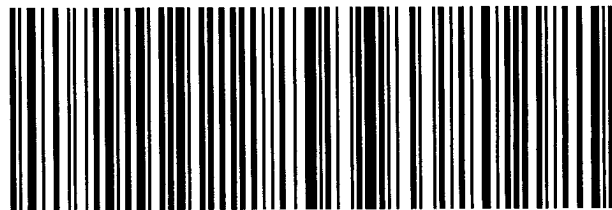
Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA

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2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812176

1. The following report consists of analytical results for 18 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812176-5, -6, -12, and -12DUP were sealed in steel cans on 12/24/08 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/14/09 is at least 97.8%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.9%. The remaining samples in the work order were packed in standard 100 gram geometry and analyzed for ^{228}Ra only.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/14/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volumes were insufficient to allow preparation of duplicates. A duplicate analysis of sample 0812176-4, -12, and -13 was performed in lieu of prepared duplicates.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples.
7. The library used for calibration and analysis for samples 0812176-5, -6, -12, and -12DUP employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium.

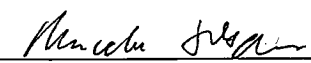


8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. Due to the nature of electronics involved in gamma spectroscopy, any detector acquiring data with the same multi-channel buffer (MCB) is affected by all other detector inputs in that same MCB. A high activity calibration source was counting in detector 4, which is in the same MCB as detector 3. Sample 0812176-3 and the laboratory control sample associated with batch GS090106-3 were counted in detector 3 on 01/13/09. Thus, the observed dead time for these samples count was greater than 10% at 12.28% and 10.63%. Analyst review of the data does not indicate a problem with the spectral acquisition for these samples. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. Results are submitted without further qualification. Please refer to QASS 360429 and 360430.
11. The requested detection limit of 1 pCi/gram for ^{228}Ra was not met for samples 0812176-2, -5, -7, -8, -9, -10, -15, -16, -17, and -18, as identified with an "M3" qualifier on the final reports. The reported activity for these samples is greater than the achieved detection limit. Results are submitted without further qualification.
12. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Linda Arend
Radiochemistry Primary Data Reviewer

02/04/09
Date


Radiochemistry Final Data Reviewer

2-4-09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812176

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
OD-SD-02-1.5-30	0812176-1		SOIL	28-Jul-08	11:11
OD-SD-04-0-1.5	0812176-2		SOIL	28-Jul-08	12:34
OD-SD-04-1.5-3.0	0812176-3		SOIL	28-Jul-08	12:34
OD-SD-03-0-1.5	0812176-4		SOIL	28-Jul-08	13:00
OD-SD-03-1.5-3.0	0812176-5		SOIL	28-Jul-08	13:00
CP-SD-07-1.5-3.0	0812176-6		SOIL	23-Jul-08	10:47
CP-P12-0-1	0812176-7		SOIL	23-Jul-08	11:03
OD-SD-05-0-1.5	0812176-8		SOIL	29-Jul-08	8:16
OD-SD-01-0-1.5	0812176-9		SOIL	28-Jul-08	10:58
OD-SD-01-1.5-3.0	0812176-10		SOIL	28-Jul-08	10:58
OD-SD-06-0-1.5	0812176-11		SOIL	29-Jul-08	8:30
OD-SD-06-1.5-3.0	0812176-12		SOIL	29-Jul-08	8:30
OD-JS-01-0-1	0812176-13		SOIL	29-Jul-08	9:19
OD-JS-02-0-1	0812176-14		SOIL	29-Jul-08	9:57
OD-JS-02-1-3	0812176-15		SOIL	29-Jul-08	9:57
EM-C22-0-1	0812176-16		SOIL	29-Jul-08	12:18
EM-E24-0-1	0812176-17		SOIL	29-Jul-08	13:21
EM-E24-1-3	0812176-18		SOIL	29-Jul-08	13:21



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812176

Page 1 of 2

Date: 12/16/08

Project Name/No.: FM1-VIP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: Date 60 day or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: steven_v Vaughn@URS Corp.com

Company: Freepoint McMoran

Address: 6200 W Duval Mine Rd

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
0D-SD-02-15-30	7/28/08	1111	1	S	n/a	1
0D-SD-04-0-15	7/28/08	1234	2	S	n/a	1
0D-SD-04-15-30	7/28/08	1234	3	S	n/a	1
0D-SD-03-0-15	7/28/08	1300	4	S	n/a	1
0D-SD-03-15-30	7/28/08	1300	5	S	n/a	1
0P-SD-07-15-30	7/27/08	1047	6	S	n/a	1
0P-T12-0-1	7/23/08	1103	7	S	n/a	1
0D-SD-05-0-15	7/29/08	8169	8	S	n/a	1
0P-SD-08-0-15	7/28/08	0910	9	S	n/a	1
0D-SD-01-0-15	7/28/08	1058	10	S	n/a	1

*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 0508 VT

Trk # 7961 9066 6706

Relinquished By: (1)

Signature: K. Walsh

Printed Name: Kevin Walsh

Date: 12/16/08 Time: 1600

Company: URS

Received By: (1)

Signature: J. Walsh

Printed Name: J. Walsh

Date: 12/17/08 Time: 1045

Company: ALS Paragon

Relinquished By: (2)

Signature: _____

Printed Name: _____

Date: _____ Time: _____

Company: _____

Received By: (2)

Signature: _____

Printed Name: _____

Date: _____ Time: _____

Company: _____



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812176

Page 2 of 2

Date: 12-16-08

Project Name/No.: FM1-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due _____) Disposed Date 60 day or Return to Client _____

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: steven_v Vaughn@wscorp.com
Company: Freeport McMoran
Address: 6200 W Duvall Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers
01D-SD-01-15-3-0	7/23/08	1058	11	S	n/a	1
01D-SD-06-0-1-5	7/24/08	0830	12	S	n/a	1
01D-SD-06-15-3-0	7/24/08	0830	13	S	n/a	1
01D-JS-01-0-1	7/24/08	0919	14	S	n/a	1
01D-JS-02-0-1	7/24/08	0957	15	S	n/a	1
01D-JS-02-1-3	7/24/08	0957	16	S	n/a	1
EM-C22-0-1	7/24/08	1218	17	S	n/a	1
EM-C22-5-7	7/24/08	1223	18	S	n/a	1
EM-E24-0-1	7/24/08	1321	19	S	n/a	1
EM-E24-1-3	7/24/08	1321	20	S	n/a	1

Comments:		Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter	
(1) Relinquished By:		(2) Relinquished By:	
Signature _____	Signature _____	Signature _____	Signature _____
Printed Name _____	Printed Name _____	Printed Name _____	Printed Name _____
Date 12/16/08	Date _____	Date _____	Date _____
Time 1600	Time _____	Time _____	Time _____
Company _____	Company _____	Company _____	Company _____
(1) Received By:		(2) Received By:	
Signature _____	Signature _____	Signature _____	Signature _____
Printed Name _____	Printed Name _____	Printed Name _____	Printed Name _____
Date 12/16/08	Date _____	Date _____	Date _____
Time 1045	Time _____	Time _____	Time _____
Company _____	Company _____	Company _____	Company _____

Order No. 0508 VT
Trk # 79619066 6706

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812176Project Manager: JmeInitials: LJODate: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u>
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u>
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<u>RAD ONLY</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. sec Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

★ Samples CP-SD-08-0-1.5 and EM-C22-5-7 were received broken. PM notified.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: Jme 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/26/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/NET8091
 Account#: S *****
 Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



0812176

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

3 of 4

WED - 17DEC

AA

MPS# 7961 9066 6706

0263

STANDARD OVERNIGHT

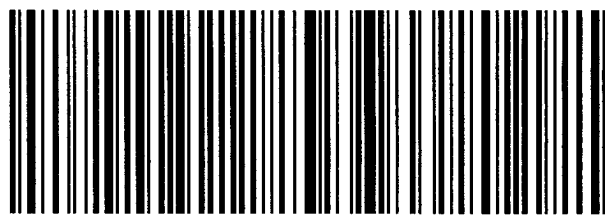
Mstr# 7971 8719 9690 0201

80524

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DEN

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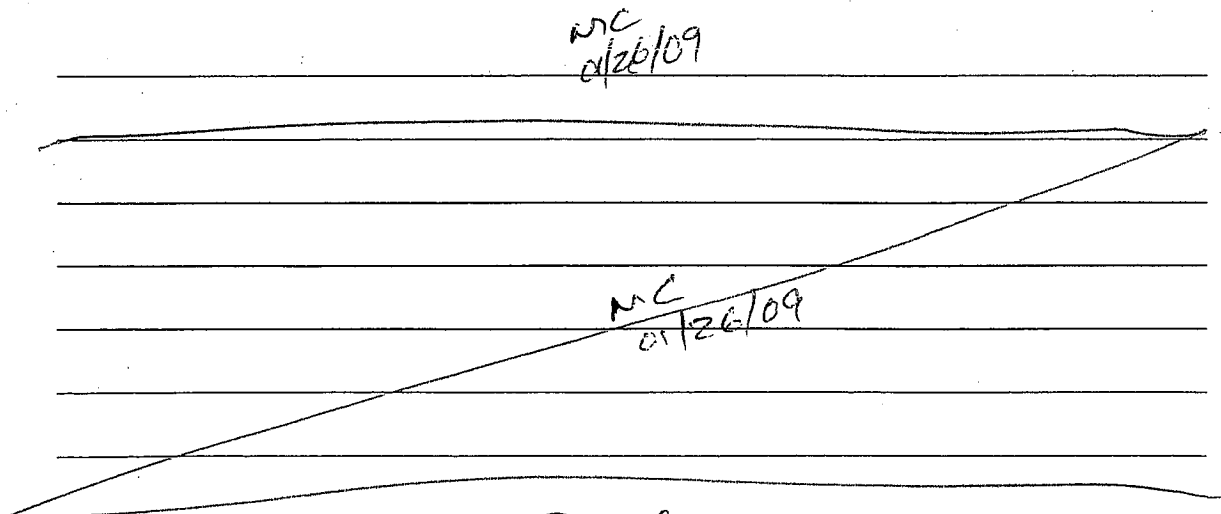
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QUALITY ASSURANCE SUMMARY SHEET

65081218-2
PAR W.O. # / BATCH 0812175, 0812176
TEST γ-SPEC
METHOD γ-SCAN
SOP/REV (PREP) —
SOP/REV (ANAL) 713

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

MC 01/26/09
Samples 0812175-17 and 0812176-3 were counted on 1/13/09 in detector 3. The observed dead time for the sample counts was greater than 10%, at 12.58% and 12.28%, respectfully. During the spectral acquisition of these samples, a high activity calibration source was counting in detector 4. This detector is in the same multi-channel buffer (MCB) as detector 3. Due to the nature of the electronics involved in gamma spectroscopy, any detector acquiring data within the same MCB is affected by all other detector inputs in that MCB. Thus, the source activity in detector 4 caused an increase in the dead time observed for the entire MCB containing detectors 3 and 4. Analyst review of the raw data does not indicate any problems with the spectral acquisition for these samples. All data quality objectives were met and the results are submitted without further qualification. MC 01/26/09



TECHNICIAN/ANALYST

[Signature]

DATE 01/26/09

DEPARTMENT MANAGER

[Signature]

DATE 1-27-09

360429

QUALITY ASSURANCE SUMMARY SHEET

PAR W.O. # / BATCH

0812176, 177, 178, 212 /
65090106-3

TEST

5-SCAN

METHOD

5-SPEC

SOP/REV (PREP)

—

SOP/REV (ANAL)

713

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

MC
01/28/09

The laboratory control sample GS090106-3LCS was counted on 1/13/09 in detector 3. The observed dead time for the count of the laboratory control sample was greater than 10%, at 10.63%. During the spectral acquisition of this source, a high activity calibration source was counting in detector 4. This detector is in the same multi-channel buffer (MCB) as detector 3. Due to the nature of the electronics involved in gamma spectroscopy, any detector acquiring data within the same MCB is affected by all other detector inputs in that MCB. Thus, the source activity in detector 4 caused an increase in the dead time observed for the entire MCB containing detectors 3 and 4. Analyst review of the raw data does not indicate any problems with the spectral acquisition for these samples. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. All data quality objectives were met and the results are submitted without further qualification.

MC
01/28/09

MC
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TECHNICIAN/ANALYST

DATE 01/28/09

DEPARTMENT MANAGER

DATE 1/28/09

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Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-2MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Final Aliquot: 97.8 g

Result Units: pCi/g

File Name: 090086d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.019 +/- 0.35	0.68	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-2MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Final Aliquot: 199 g

Result Units: pCi/g

File Name: 090073d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.070 +/- 0.19	0.38	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-2MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Final Aliquot: 199 g

Result Units: pCi/g

File Name: 090073d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.081 +/- 0.34	0.65	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 45 minutes

Final Aliquot: 94.1 g

Result Units: pCi/g

File Name: 090060d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.20 +/- 0.34	0.59	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-2LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090029d08

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1130 +/- 132	2.85	986	114	85 - 115	P
10198-40-0	Co-60	462 +/- 54.2	1.21	457	101	85 - 115	P
10045-97-3	Cs-137	377 +/- 44.3	1.56	374	101	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-2ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090037d08

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	459 +/- 53.7	2.34	470	97.5	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812176-1

Date Printed: Monday, February 02, 2009

ALS Paragon

LIMS Version: 6.241A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-2LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090081d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	480 +/- 57.3	12.2	462	104	85 - 115	P
10198-40-0	Co-60	211 +/- 24.8	0.934	214	98.4	85 - 115	P
10045-97-3	Cs-137	179 +/- 21.1	1.31	175	102	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812176-1

Date Printed: Monday, February 02, 2009

ALS Paragon

LIMS Version: 6.241A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090067d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1020 +/- 120	14.2	986	103	85 - 115	P
10198-40-0	Co-60	454 +/- 53.2	1.41	457	99.3	85 - 115	P
10045-97-3	Cs-137	404 +/- 47.4	1.87	374	108	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-03-0-1.5

Lab ID: 0812176-4DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 114 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090072d03

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	3.0 +/- 0.65	3.2 +/- 0.69	0.22	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-06-1.5-3.0

Lab ID: 0812176-12DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090070d02A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.6 +/- 0.45	2.5 +/- 0.42	0.07	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Date Printed: Monday, February 02, 2009

ALS Paragon

LIMS Version: 6.241A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-06-1.5-3.0

Lab ID: 0812176-12DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090070d02

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.0 +/- 0.57	2.1 +/- 0.56	0.03	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-01-0-1
Lab ID: 0812176-13DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 29-Jul-08
Date Prepared: 31-Dec-08
Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3
QCBatchID: GS090106-3-1
Run ID: GS090106-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 92.3 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090016d08

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.8 +/- 0.66	1.7 +/- 0.52	0.17	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-02-1.5-30

Lab ID: 0812176-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 111 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090027d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.56	0.79	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-04-0-1.5

Lab ID: 0812176-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 112 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090063d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.63	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-04-1.5-3.0

Lab ID: 0812176-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 104 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090070d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.56	0.81	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-03-0-1.5

Lab ID: 0812176-4

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 114 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090060d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.0 +/- 0.65	0.88	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-03-0-1.5

Lab ID: 0812176-4DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 114 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090072d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.2 +/- 0.69	0.82	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-03-1.5-3.0

Lab ID: 0812176-5

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 196 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090072d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.42	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-03-1.5-3.0

Lab ID: 0812176-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 196 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090072d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.59	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-07-1.5-3.0

Lab ID: 0812176-6

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 212 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090069d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.38	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-07-1.5-3.0
Lab ID:	0812176-6

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 212 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090069d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.60	0.83	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-0-1

Lab ID: 0812176-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 89.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090085d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.62	1.1	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-05-0-1.5

Lab ID: 0812176-8

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 90.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090028d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.9 +/- 0.72	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-01-0-1.5

Lab ID: 0812176-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 114 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090064d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.68	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-01-1.5-3.0

Lab ID: 0812176-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 106 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090071d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.57	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-06-0-1.5

Lab ID: 0812176-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 76.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090061d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.2 +/- 0.77	0.96	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-06-1.5-3.0

Lab ID: 0812176-12

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090080d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.45	0.54	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-06-1.5-3.0

Lab ID: 0812176-12DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090070d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.42	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-06-1.5-3.0

Lab ID: 0812176-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090080d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.57	0.88	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-06-1.5-3.0

Lab ID: 0812176-12DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090070d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.56	0.90	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-01-0-1

Lab ID: 0812176-13

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 92.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090076d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.66	0.99	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-01-0-1
Lab ID: 0812176-13DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 92.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090016d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.52	0.92	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-02-0-1
Lab ID:	0812176-14

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 103 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090015d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.46	0.67	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Date Printed: Monday, February 02, 2009

ALS Paragon

LIMS Version: 6.241A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-02-1-3

Lab ID: 0812176-15

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 108 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090052d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.69	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Date Printed: Monday, February 02, 2009

ALS Paragon

LIMS Version: 6.241A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-C22-0-1

Lab ID: 0812176-16

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 103 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090077d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.52	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-E24-0-1

Lab ID: 0812176-17

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090053d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.60	1.2	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-E24-1-3
Lab ID:	0812176-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 98.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.56	1.0	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

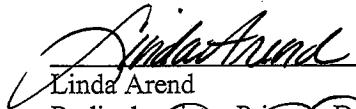
Work Order Number: 0812176

1. This report consists of the analytical results for 18 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. To reduce potential matrix interference, a reduced aliquot of ~1g was taken for all the samples. Due to the amount of high activity detected in the pre-screen, samples 0812176-4 and -7 were prepared at a greater reduced aliquot of ~0.5g. To prevent any potential bleed through of Pu, 3 drops of NaNO₂ were added to all the samples.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 01/30/09.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. Uranium-235 activity is reported in the associated method blank above the minimum detectable concentration value, as indicated with a "B3" qualifier on the final report. The measured blank activity is below the requested MDC of 0.1 pCi/gram. Results are acceptable according to SOP715R15, and are submitted without further qualification.

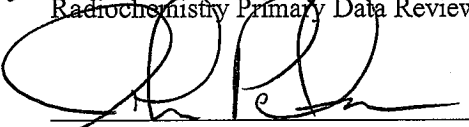


7. The requested MDC of 0.1 pCi/gram was not met for ^{234}U and ^{238}U for sample 0812176-4, as indicated with an "M3" qualifier on the final report. The reported activity for this sample is greater than the achieved MDC. Results are submitted without further qualification.
8. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



Linda Arend
Radiochemistry Primary Data Reviewer



Radiochemistry Final Data Reviewer

02/03/09
Date

2/3/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812176

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
OD-SD-02-1.5-30	0812176-1		SOIL	28-Jul-08	11:11
OD-SD-04-0-1.5	0812176-2		SOIL	28-Jul-08	12:34
OD-SD-04-1.5-3.0	0812176-3		SOIL	28-Jul-08	12:34
OD-SD-03-0-1.5	0812176-4		SOIL	28-Jul-08	13:00
OD-SD-03-1.5-3.0	0812176-5		SOIL	28-Jul-08	13:00
CP-SD-07-1.5-3.0	0812176-6		SOIL	23-Jul-08	10:47
CP-P12-0-1	0812176-7		SOIL	23-Jul-08	11:03
OD-SD-05-0-1.5	0812176-8		SOIL	29-Jul-08	8:16
OD-SD-01-0-1.5	0812176-9		SOIL	28-Jul-08	10:58
OD-SD-01-1.5-3.0	0812176-10		SOIL	28-Jul-08	10:58
OD-SD-06-0-1.5	0812176-11		SOIL	29-Jul-08	8:30
OD-SD-06-1.5-3.0	0812176-12		SOIL	29-Jul-08	8:30
OD-JS-01-0-1	0812176-13		SOIL	29-Jul-08	9:19
OD-JS-02-0-1	0812176-14		SOIL	29-Jul-08	9:57
OD-JS-02-1-3	0812176-15		SOIL	29-Jul-08	9:57
EM-C22-0-1	0812176-16		SOIL	29-Jul-08	12:18
EM-E24-0-1	0812176-17		SOIL	29-Jul-08	13:21
EM-E24-1-3	0812176-18		SOIL	29-Jul-08	13:21



PARAGON
ANALYTICALS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812176

Page 1 of 2

Date: 12/16/08

Project Name/No.: FM1-VIP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: Date 60 day or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: steven_v Vaughn@URS Corp.com

Company: Freepoint McMoran

Address: 6200 W Duval Mine Rd

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
0D-SD-02-15-30	7/28/08	1111	1	S	n/a	1
0D-SD-04-0-15	7/28/08	1234	2	S	n/a	1
0D-SD-04-15-30	7/28/08	1234	3	S	n/a	1
0D-SD-03-0-15	7/28/08	1300	4	S	n/a	1
0D-SD-03-15-30	7/28/08	1300	5	S	n/a	1
0P-SD-07-15-30	7/27/08	1047	6	S	n/a	1
0P-T12-0-1	7/23/08	1103	7	S	n/a	1
0D-SD-05-0-15	7/29/08	8169	8	S	n/a	1
0P-SD-08-0-15	7/28/08	0910	9	S	n/a	1
0D-SD-01-0-15	7/28/08	1058	10	S	n/a	1

*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 0508 VT

Trk # 7961 9066 6706

Relinquished By: (1)

Signature: K. Walsh

Printed Name: Kevin Walsh

Date: 12/16/08 Time: 1600

Company: URS

Received By: (1)

Signature: J. Walsh

Printed Name: J. Walsh

Date: 12/17/08 Time: 1045

Company: ALS Paragon

Relinquished By: (2)

Signature: _____

Printed Name: _____

Date: _____ Time: _____

Company: _____

Received By: (2)

Signature: _____

Printed Name: _____

Date: _____ Time: _____

Company: _____



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812176

Page 2 of 2

Date: 12-16-08

Project Name/No.: FM1-VZP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due _____) Disposed Date 60 day or Return to Client _____

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: steven_v Vaughn@wscorp.com
Company: Freeport McMoran
Address: 6200 W Duvall Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers
01D-SD-01-15-3-0	7/23/08	1058	11	S	n/a	1
01D-SD-06-0-1-5	7/24/08	0830	12	S	n/a	1
01D-SD-06-15-3-0	7/24/08	0830	13	S	n/a	1
01D-JS-01-0-1	7/24/08	0919	14	S	n/a	1
01D-JS-02-0-1	7/24/08	0957	15	S	n/a	1
01D-JS-02-1-3	7/24/08	0957	16	S	n/a	1
EM-C22-0-1	7/24/08	1218	17	S	n/a	1
EM-C22-5-7	7/24/08	1223	18	S	n/a	1
EM-E24-0-1	7/24/08	1321	19	S	n/a	1
EM-E24-1-3	7/24/08	1321	20	S	n/a	1

Comments:		Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter	
(1) Relinquished By:		(2) Relinquished By:	
Signature _____	Signature _____	Signature _____	Signature _____
Printed Name _____	Printed Name _____	Printed Name _____	Printed Name _____
Date 12/16/08	Date _____	Date _____	Date _____
Time 1600	Time _____	Time _____	Time _____
Company _____	Company _____	Company _____	Company _____
(1) Received By:		(2) Received By:	
Signature _____	Signature _____	Signature _____	Signature _____
Printed Name _____	Printed Name _____	Printed Name _____	Printed Name _____
Date 12/16/08	Date _____	Date _____	Date _____
Time 1045	Time _____	Time _____	Time _____
Company _____	Company _____	Company _____	Company _____

Order No. 0508 VT
Trk # 79619066 6706

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812176Project Manager: JmeInitials: LJODate: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u>
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u>
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<u>RAD ONLY</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. sec Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

★ Samples CP-SD-08-0-1.5 and EM-C22-5-7 were received broken. PM notified.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: Jme 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/26/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/NET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



0812176

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

3 of 4

WED - 17DEC

AA

MPS# 7961 9066 6706

0263

STANDARD OVERNIGHT

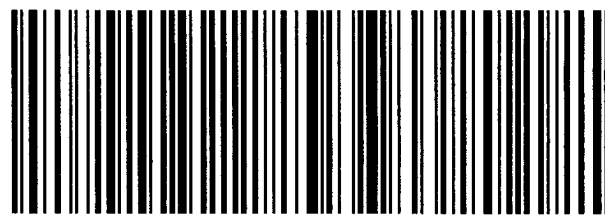
Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090127-5MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Jan-09

Date Prepared: 27-Jan-09

Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Final Aliquot: 0.959 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.015 +/- 0.023	0.041	0.1	U
15117-96-1	U-235	0.023 +/- 0.028	0.021	0.1	B3
7440-61-1	U-238	0.0097 +/- 0.024	0.054	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.711	4.03	pCi/g	85.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090127-5LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Jan-09

Date Prepared: 27-Jan-09

Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Final Aliquot: 0.959 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.72 +/- 0.871	0.0772	4.52	104	82 - 122	P
7440-61-1	U-238	5.01 +/- 0.919	0.0582	4.70	107	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.711	3.39	pCi/g	72.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812176-1

Date Printed: Tuesday, February 03, 2009

ALS Paragon

LIMS Version: 6.242A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-03-1.5-3.0

Lab ID: 0812176-5DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	4.5 +/- 0.80	4.8 +/- 0.86	0.28	2.13	
15117-96-1	U-235	0.23 +/- 0.089	0.38 +/- 0.12	1.02	2.13	
7440-61-1	U-238	4.8 +/- 0.85	5.1 +/- 0.91	0.28	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-02-1-3
Lab ID: 0812176-15DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.5 +/- 0.47	2.4 +/- 0.45	0.16	2.13	
15117-96-1	U-235	0.079 +/- 0.049	0.075 +/- 0.049	0.06	2.13	LT
7440-61-1	U-238	2.4 +/- 0.46	2.3 +/- 0.44	0.15	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-02-1.5-30
Lab ID:	0812176-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.050	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.037	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.450	3.79	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-04-0-1.5
Lab ID:	0812176-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.49	0.050	0.1	
15117-96-1	U-235	0.18 +/- 0.079	0.047	0.1	
7440-61-1	U-238	2.6 +/- 0.49	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.511	3.64	pCi/g	80.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-04-1.5-3.0
Lab ID:	0812176-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.34	0.054	0.1	
15117-96-1	U-235	0.10 +/- 0.059	0.047	0.1	
7440-61-1	U-238	1.6 +/- 0.34	0.066	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.488	3.30	pCi/g	73.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-03-0-1.5
Lab ID:	0812176-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.504 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.7 +/- 0.72	0.11	0.1	M3
15117-96-1	U-235	0.31 +/- 0.14	0.097	0.1	
7440-61-1	U-238	4.0 +/- 0.77	0.12	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.962	8.15	pCi/g	91.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-03-1.5-3.0
Lab ID:	0812176-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.5 +/- 0.80	0.038	0.1	
15117-96-1	U-235	0.23 +/- 0.089	0.044	0.1	
7440-61-1	U-238	4.8 +/- 0.85	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.463	3.71	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-03-1.5-3.0

Lab ID: 0812176-5DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.8 +/- 0.86	0.047	0.1	
15117-96-1	U-235	0.38 +/- 0.12	0.019	0.1	
7440-61-1	U-238	5.1 +/- 0.91	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.473	3.55	pCi/g	79.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-07-1.5-3.0
Lab ID:	0812176-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.034	0.1	
15117-96-1	U-235	0.12 +/- 0.067	0.055	0.1	
7440-61-1	U-238	2.2 +/- 0.44	0.051	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	3.50	pCi/g	78.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P12-0-1
Lab ID:	0812176-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.511 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.39	0.083	0.1	
15117-96-1	U-235	0.19 +/- 0.11	0.037	0.1	
7440-61-1	U-238	1.7 +/- 0.39	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.844	7.20	pCi/g	81.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-05-0-1.5	Sample Matrix: SOIL	Prep Batch: AS090127-5	Final Aliquot: 1.00 g
Lab ID: 0812176-8	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090127-5-1	Prep Basis: Dry Weight
	Date Collected: 29-Jul-08	Run ID: AS090127-5A	Moisture(%): NA
	Date Prepared: 27-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.9 +/- 0.70	0.054	0.1	
15117-96-1	U-235	0.18 +/- 0.079	0.060	0.1	
7440-61-1	U-238	3.7 +/- 0.67	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.519	3.69	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-01-0-1.5
Lab ID:	0812176-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.029	0.1	
15117-96-1	U-235	0.099 +/- 0.055	0.047	0.1	LT
7440-61-1	U-238	2.2 +/- 0.42	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.440	3.79	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-01-1.5-3.0
Lab ID:	0812176-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.039	0.1	
15117-96-1	U-235	0.091 +/- 0.051	0.018	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.425	3.73	pCi/g	84.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-06-0-1.5	Sample Matrix: SOIL	Prep Batch: AS090127-5	Final Aliquot: 1.00 g
Lab ID: 0812176-11	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090127-5-1	Prep Basis: Dry Weight
	Date Collected: 29-Jul-08	Run ID: AS090127-5A	Moisture(%): NA
	Date Prepared: 27-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 30-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.50	0.039	0.1	
15117-96-1	U-235	0.18 +/- 0.075	0.034	0.1	
7440-61-1	U-238	3.1 +/- 0.56	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	3.88	pCi/g	86.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-06-1.5-3.0
Lab ID:	0812176-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.4 +/- 0.79	0.016	0.1	
15117-96-1	U-235	0.23 +/- 0.088	0.044	0.1	
7440-61-1	U-238	4.5 +/- 0.80	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.61	pCi/g	80.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-01-0-1
Lab ID:	0812176-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.52	0.033	0.1	
15117-96-1	U-235	0.11 +/- 0.057	0.039	0.1	
7440-61-1	U-238	2.9 +/- 0.52	0.014	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.96	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-02-0-1
Lab ID:	0812176-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.015	0.1	
15117-96-1	U-235	0.052 +/- 0.038	0.018	0.1	LT
7440-61-1	U-238	2.1 +/- 0.40	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.516	3.95	pCi/g	87.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-02-1-3	Sample Matrix: SOIL	Prep Batch: AS090127-5	Final Aliquot: 1.01 g
Lab ID: 0812176-15	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090127-5-1	Prep Basis: Dry Weight
	Date Collected: 29-Jul-08	Run ID: AS090127-5A	Moisture(%): NA
	Date Prepared: 27-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 30-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.47	0.036	0.1	
15117-96-1	U-235	0.079 +/- 0.049	0.036	0.1	LT
7440-61-1	U-238	2.4 +/- 0.46	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.73	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-02-1-3

Lab ID: 0812176-15DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.45	0.036	0.1	
15117-96-1	U-235	0.075 +/- 0.049	0.048	0.1	LT
7440-61-1	U-238	2.3 +/- 0.44	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.404	3.62	pCi/g	82.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-C22-0-1
Lab ID:	0812176-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.045	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.043	0.1	
7440-61-1	U-238	1.9 +/- 0.37	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.484	3.81	pCi/g	84.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-E24-0-1
Lab ID:	0812176-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.053	0.1	
15117-96-1	U-235	0.086 +/- 0.052	0.044	0.1	LT
7440-61-1	U-238	1.7 +/- 0.35	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.490	3.88	pCi/g	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-E24-1-3
Lab ID:	0812176-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.41	0.057	0.1	
15117-96-1	U-235	0.11 +/- 0.074	0.056	0.1	
7440-61-1	U-238	1.8 +/- 0.41	0.065	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.496	2.52	pCi/g	56.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

Freeport McMoRan Sierrita

FMI-VRP

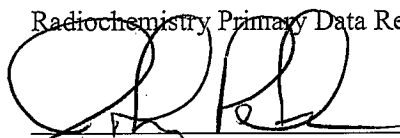
Work Order Number: 0812176

1. This report consists of the analytical results for 15 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared and analyzed according to procedures SOP783R8 and SOP336R0. The analyses were completed on 03/04/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Linda Arend
Radiochemistry Primary Data Reviewer

03/06/09
Date


Radiochemistry Final Data Reviewer

03/06/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812176

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
OD-SD-02-1.5-30	0812176-1		SOIL	28-Jul-08	11:11
OD-SD-04-0-1.5	0812176-2		SOIL	28-Jul-08	12:34
OD-SD-04-1.5-3.0	0812176-3		SOIL	28-Jul-08	12:34
OD-SD-03-0-1.5	0812176-4		SOIL	28-Jul-08	13:00
OD-SD-03-1.5-3.0	0812176-5		SOIL	28-Jul-08	13:00
CP-SD-07-1.5-3.0	0812176-6		SOIL	23-Jul-08	10:47
CP-P12-0-1	0812176-7		SOIL	23-Jul-08	11:03
OD-SD-05-0-1.5	0812176-8		SOIL	29-Jul-08	8:16
OD-SD-01-0-1.5	0812176-9		SOIL	28-Jul-08	10:58
OD-SD-01-1.5-3.0	0812176-10		SOIL	28-Jul-08	10:58
OD-SD-06-0-1.5	0812176-11		SOIL	29-Jul-08	8:30
OD-SD-06-1.5-3.0	0812176-12		SOIL	29-Jul-08	8:30
OD-JS-01-0-1	0812176-13		SOIL	29-Jul-08	9:19
OD-JS-02-0-1	0812176-14		SOIL	29-Jul-08	9:57
OD-JS-02-1-3	0812176-15		SOIL	29-Jul-08	9:57
EM-C22-0-1	0812176-16		SOIL	29-Jul-08	12:18
EM-E24-0-1	0812176-17		SOIL	29-Jul-08	13:21
EM-E24-1-3	0812176-18		SOIL	29-Jul-08	13:21



PARAGON ANALYTICALS

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812176

Page 1 of 2

Date: 12/16/08

Project Name/No.: FM1-VIP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: 60 day or Return to Client

Report To: Steven Vaughan
Phone: (520) 407-2845
Fax:

E-mail: steven_vanughn@urcorp.com
Company: Freepoint McMoran
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
0D-SD-02-15-30	7/28/08	1111	1	S	n/a	1
0D-SD-04-0-15	7/28/08	1234	2	S	n/a	1
0D-SD-04-15-30	7/28/08	1234	3	S	n/a	1
0D-SD-03-0-15	7/28/08	1300	4	S	n/a	1
0D-SD-03-15-30	7/28/08	1300	5	S	n/a	1
0P-SD-07-15-30	7/27/08	1047	6	S	n/a	1
0P-T12-0-1	7/23/08	1103	7	S	n/a	1
0D-SD-05-0-15	7/29/08	8169	8	S	n/a	1
0P-SD-08-0-15	7/28/08	091037	9	S	n/a	1
0D-SD-01-0-15	7/28/08	10580169	10	S	n/a	1

*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 0508 VT

Trk # 7961 9066 6706

Relinquished By: K. Walsh

Signature Kevin Walsh
Printed Name Kevin Walsh
Date 12/16/08 Time 1600
Company URS

Relinquished By:

Signature
Printed Name
Date Time
Company

Received By: James Foran

Signature James Foran
Printed Name James Foran
Date 12/17/08 Time 1045
Company ALS Paragon

Received By:

Signature
Printed Name
Date Time
Company



PARAGON
ANALYTICS

ALS Paragon

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812176

Page 2 of 2

Date: 12-16-08

Project Name/No.: FM1-VZP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due _____) Disposed Date 60 day or Return to Client _____

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: steven_v Vaughn@wscorp.com
Company: Freeport McMoran
Address: 6200 W Duvall Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers
01D-SD-01-15-3-0	7/23/08	1058	11	S	n/a	1
01D-SD-06-0-1-5	7/24/08	0830	12	S	n/a	1
01D-SD-06-15-3-0	7/24/08	0830	13	S	n/a	1
01D-JS-01-0-1	7/24/08	0919	14	S	n/a	1
01D-JS-02-0-1	7/24/08	0957	15	S	n/a	1
01D-JS-02-1-3	7/24/08	0957	16	S	n/a	1
EM-C22-0-1	7/24/08	1218	17	S	n/a	1
EM-C22-5-7	7/24/08	1223	18	S	n/a	1
EM-E24-0-1	7/24/08	1321	19	S	n/a	1
EM-E24-1-3	7/24/08	1321	20	S	n/a	1

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter		Relinquished By: (1) Signature: <u>Kevin Walsh</u> Printed Name: <u>Kevin Walsh</u> Date: <u>12/16/08</u> Time: <u>1600</u> Company: <u>URS</u>		Relinquished By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____	
Comments: Order No. 0508 VT		Received By: (1) Signature: <u>Lara J. Orban</u> Printed Name: <u>Lara J. Orban</u> Date: <u>12/16/08</u> Time: <u>1045</u> Company: <u>ALS Paragon</u>		Received By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____	

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812176Project Manager: JmeInitials: LJO Date: 12/17/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u>
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u>
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<u>RAD ONLY</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. sec Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

★ Samples CP-SD-08-0-1.5 and EM-C22-5-7 were received broken. PM notified.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: Jme 12/22/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/26/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/NET8091
 Account#: S *****
 Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



0812176

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

3 of 4

WED - 17DEC

AA

MPS# 7961 9066 6706

0263

STANDARD OVERNIGHT

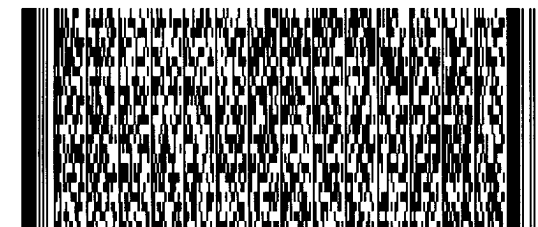
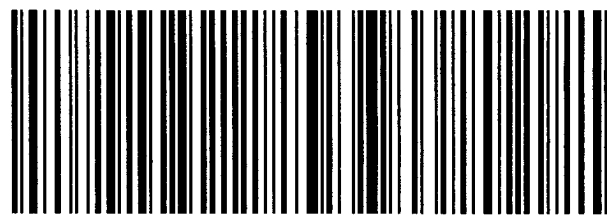
Mstr# 7971 8719 9690 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-3MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Final Aliquot: 1.02 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.088 +/- 0.11	0.26	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812176-1

Date Printed: Friday, March 06, 2009

ALS Paragon
LIMS Version: 6.249A

Page 1 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-4MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.16 +/- 0.38	0.72	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812176-1

Date Printed: Friday, March 06, 2009

ALS Paragon
LIMS Version: 6.249A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Final Aliquot: 1.02 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	30.4 +/- 5.67	0.349	43.9	69.2	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812176-1

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

Page 1 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-4LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	47.5 +/- 8.69	0.366	44.6	107	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812176-1

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

Page 2 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-01-1.5-3.0

Lab ID: 0812176-10MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 28-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	49.5	1.6	0.451	44.5	108	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812176-1

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-02-1.5-30

Lab ID: 0812176-1DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 28-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.5 +/- 0.83	1.9 +/- 0.63	0.62	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-01-1.5-3.0

Lab ID: 0812176-10DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 28-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.6 +/- 0.50	1.7 +/- 0.54	0.10	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-02-1.5-30
Lab ID:	0812176-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.83	0.69	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-02-1.5-30
Lab ID:	0812176-1DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 28-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.63	0.36	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-04-0-1.5
Lab ID:	0812176-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.66	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-04-1.5-3.0
Lab ID:	0812176-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.63	0.22	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-03-0-1.5	Sample Matrix: SOIL	Prep Batch: RE090203-3	Final Aliquot: 1.02 g
Lab ID: 0812176-4	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-3-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: RE090203-3A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.70	0.25	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P12-0-1
Lab ID:	0812176-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.43	0.055	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-05-0-1.5
Lab ID:	0812176-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.68	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-01-0-1.5
Lab ID:	0812176-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.59	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-01-1.5-3.0
Lab ID:	0812176-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.50	0.31	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-01-1.5-3.0
Lab ID:	0812176-10DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 28-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.54	0.28	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-06-0-1.5
Lab ID:	0812176-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.64 +/- 0.29	0.18	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-JS-01-0-1
Lab ID:	0812176-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.1 +/- 0.91	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-JS-02-0-1
Lab ID:	0812176-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.5 +/- 1.1	0.79	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-JS-02-1-3
Lab ID:	0812176-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.3 +/- 0.79	0.22	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-C22-0-1
Lab ID:	0812176-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.61	0.20	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-E24-0-1
Lab ID:	0812176-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.54 +/- 0.25	0.20	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-E24-1-3
Lab ID:	0812176-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.68	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita FMI-VRP

Work Order Number: 0812177

1. The following report consists of analytical results for 19 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812177-2, -2DUP, -3, -5, -6, -7, -10, and -16 were sealed in steel cans on 12/24/08 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/15/09 is at least 97.8%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.9%. The remaining samples in the work order were packed in standard 100 gram geometry and analyzed for ^{228}Ra only.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/15/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volumes were insufficient to allow preparation of duplicates. A duplicate analysis of sample 0812177-2 was performed in lieu of a prepared duplicate.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples.
7. The library used for calibration and analysis for samples 0812177-2, -2DUP, -3, -5, -6, -7, -10, and -16 employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium.

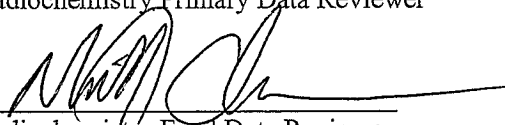


8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. Due to the nature of electronics involved in gamma spectroscopy, any detector acquiring data with the same multi-channel buffer (MCB) is affected by all other detector inputs in that same MCB. A high activity calibration source was counting in detector 4, which is in the same MCB as detector 3. GS090106-3LCS was counted in detector 3 on 01/13/09. Thus, the observed dead time for this sample count was greater than 10% at 10.63%. Analyst review of the data does not indicate a problem with the spectral acquisition for this sample. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. Results are submitted without further qualification. Please refer to QASS 360430.
11. The requested detection limit of 1 pCi/gram for ^{228}Ra was not met for samples 0812177-3, -7, -9, -11, -14, -15, and -17, as identified with an "M3" qualifier on the final reports. The reported activity for these samples is greater than the achieved detection limit. Results are submitted without further qualification.
12. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Linda Arend
Radiochemistry Primary Data Reviewer

02/05/09
Date


Radiochemistry Final Data Reviewer

02/06/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812177

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-SD-01-0-1.5	0812177-1		SOIL	16-Jul-08	8:30
CP-SD-01-1.5-3.0	0812177-2		SOIL	16-Jul-08	8:30
CP-SD-02-0-1.5	0812177-3		SOIL	16-Jul-08	9:08
CP-SD-02-1.5-3.0	0812177-4		SOIL	16-Jul-08	9:08
CP-SD-06-0-1.5	0812177-5		SOIL	16-Jul-08	9:26
CP-SD-06-1.5-3.0	0812177-6		SOIL	16-Jul-08	9:26
CP-SD-05-0-1.5	0812177-7		SOIL	16-Jul-08	9:45
CP-SD-05-1.5-3.0	0812177-8		SOIL	16-Jul-08	9:45
CP-SD-03-0-1.5	0812177-9		SOIL	16-Jul-08	9:54
CP-SD-03-1.5-3.0	0812177-10		SOIL	16-Jul-08	9:54
CP-P07-1-3	0812177-11		SOIL	17-Jul-08	14:04
CP-P07-0-1	0812177-12		SOIL	17-Jul-08	14:04
CP-P07-5-7	0812177-13		SOIL	17-Jul-08	14:11
CP-SD-04-0-1.5	0812177-14		SOIL	17-Jul-08	14:52
CP-SD-04-1.5-3.0	0812177-15		SOIL	17-Jul-08	14:52
CP-Q09-1-3	0812177-16		SOIL	23-Jul-08	10:15
CP-SD-09-0-1.5	0812177-17		SOIL	28-Jul-08	10:39
CD-SD-09-1.5-3.0	0812177-18		SOIL	28-Jul-08	10:39
CP-P12-1-3	0812177-19		SOIL	23-Jul-08	11:03
OD-SD-02-0-1.5	0812177-20		SOIL	28-Jul-08	11:11



**PARAGON
ANALYTICS**

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 1 of 2

Project Name/No.: FMI-VIRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: Date 12/15/08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: Steven.Vaughn@paragoncorp.com

Company: Freeport McMoran

Address: Green Valley, AZ 85614

6200 W Duval Ave Rd.

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-SD-01-0-1.5	7/16/08	830	①	S	n/a	1
CP-SD-01-1.5-3.0	7/16/08	830	②	S	n/a	1
CP-SD-02-0-1.5	7/16/08	908	③	S	n/a	1
CP-SD-02-1.5-3.0	7/16/08	908	④	S	n/a	1
CP-SD-06-0-1.5	7/16/08	926	⑤	S	n/a	1
CP-SD-06-1.5-3.0	7/16/08	926	⑥	S	n/a	1
CP-SD-05-0-1.5	7/16/08	945	⑦	S	n/a	1
CP-SD-05-1.5-3.0	7/16/08	945	⑧	S	n/a	1
CP-SD-03-0-1.5	7/16/08	954	⑨	S	n/a	1
CP-SD-03-1.5-3.0	7/16/08	954	⑩	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter		Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K. Walsh</u>		Signature _____		Signature _____	
Printed Name <u>Kevin Walsh</u>		Printed Name _____		Printed Name _____	
Date <u>12/15/08</u>		Date _____		Date _____	
Time <u>1600</u>		Time _____		Time _____	
Company <u>URS</u>		Company _____		Company _____	
Received By: <u>Cheryl Trimble</u>		Received By: _____		Received By: _____	
Signature _____		Signature _____		Signature _____	
Printed Name <u>Cheryl Trimble</u>		Printed Name _____		Printed Name _____	
Date <u>12-17-08</u>		Date _____		Date _____	
Time <u>1045</u>		Time _____		Time _____	
Company <u>ALS Paragon</u>		Company _____		Company _____	

Order No. 0548 VT

Trk # 7971 87199884



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 2 of 2

Project Name/No.: FMI-VRP		Sampler(s): K. Walsh		Turnaround (circle one): <u>Standard</u> or Rush (Due _____)		Dispose Date <u>60 day</u> or Return to Client _____	
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: E-mail: Steven.Vaughn@urscorp.com Company: Freepoint Mc Moran Address: 6200 W David (near Rte 20) Green Valley, AZ 85614							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers	Circle method (right); provide additional information as needed (comments).
CP-P07-1-3	7/17/08	1404	11	S	N/A	1	
CP-P07-0-1	7/17/08	1404	13	S	N/A	1	
CP-P07-5-7	7/17/08	1411	13	S	N/A	1	
CP-SD-04-0-1.5	7/17/08	1452	14	S	N/A	1	
CP-SD-04-1.5-3.0	7/17/08	1452	15	S	N/A	1	
CP-C09-1-3	7/23/08	1015	16	S	N/A	1	
CP-SD-09-0-1.5	7/23/08	1034	17	S	N/A	1	
CP-SD-09-1.5-3.0	7/23/08	1039	18	S	N/A	1	
CP-P12-1-3	7/23/08	1103	19	S	N/A	1	
OD-SD-02-0-1.5	7/23/08	1111	20	S	N/A	1	
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments: Order No. 0508VT							
Relinquished By: Signature: <u>K. Walsh</u> Printed Name: <u>Kevin Walsh</u> Date: <u>12/15/08</u> Time: <u>1600</u> Company: <u>URS</u>							
Relinquished By: Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____							
Received By: Signature: <u>Cheryl Trimble</u> Printed Name: <u>Cheryl Trimble</u> Date: <u>12-17-08</u> Time: <u>1045</u> Company: <u>ALS Paragon</u>							
Received By: Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____							

Paragon Analytics

Workorder No: 0812177

Initials: CDT Date: 12-17-08

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Project Manager Signature / Date: AK 12/20/00

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/20/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

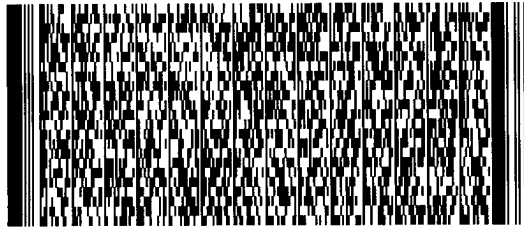
Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

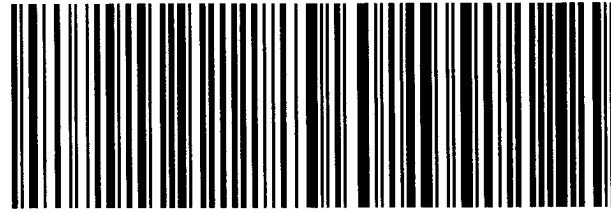


4 of 4
 MPS# 7971 8719 9884
 0263
 Mstr# 7971 8719 9690 0201

WED - 17DEC AA
 STANDARD OVERNIGHT

80524
 CO-US
 DEN

XH FTCA



1-71
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QUALITY ASSURANCE SUMMARY SHEET

PAR W.O. # / BATCH

0812176, 177, 178, 212 /
65090106-3

TEST

5-SCAN

METHOD

5-SPEC

SOP/REV (PREP)

—

SOP/REV (ANAL)

713

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

MC
01/28/09

The laboratory control sample GS090106-3LCS was counted on 1/13/09 in detector 3. The observed dead time for the count of the laboratory control sample was greater than 10%, at 10.63%. During the spectral acquisition of this source, a high activity calibration source was counting in detector 4. This detector is in the same multi-channel buffer (MCB) as detector 3. Due to the nature of the electronics involved in gamma spectroscopy, any detector acquiring data within the same MCB is affected by all other detector inputs in that MCB. Thus, the source activity in detector 4 caused an increase in the dead time observed for the entire MCB containing detectors 3 and 4. Analyst review of the raw data does not indicate any problems with the spectral acquisition for these samples. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. All data quality objectives were met and the results are submitted without further qualification.

MC
01/28/09

MC
01/28/09

MC
01/28/09

MC
01/28/09

TECHNICIAN/ANALYST

DATE 01/28/09

DEPARTMENT MANAGER

DATE 1/28/09

1C108C360430

FORM 302r6.doc (4/22/04)

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3MB

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 195 g

Result Units: pCi/g

File Name: 090052d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.093 +/- 0.20	0.34	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 45 minutes

Final Aliquot: 94.1 g

Result Units: pCi/g

File Name: 090060d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.20 +/- 0.34	0.59	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 195 g

Result Units: pCi/g

File Name: 090052d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.17 +/- 0.37	0.76	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090067d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1020 +/- 120	14.2	986	103	85 - 115	P
10198-40-0	Co-60	454 +/- 53.2	1.41	457	99.3	85 - 115	P
10045-97-3	Cs-137	404 +/- 47.4	1.87	374	108	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3ALCS

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090086d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	451 +/- 52.9	2.97	470	96.0	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090097d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	486 +/- 58.1	12.4	462	105	85 - 115	P
10198-40-0	Co-60	213 +/- 25.0	0.839	214	99.3	85 - 115	P
10045-97-3	Cs-137	177 +/- 20.8	1.22	175	101	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090045d08A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.2 +/- 0.39	2.3 +/- 0.41	0.23	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090045d08

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.4 +/- 0.57	2.5 +/- 0.58	0.10	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3
Lab ID: 0812177-19DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 23-Jul-08
Date Prepared: 31-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3
QCBatchID: GS090106-3-1
Run ID: GS090106-3A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 91.5 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090066d03

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.9 +/- 0.67	1.2 +/- 0.45	0.80	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5

Lab ID: 0812177-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 96.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090017d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.50	0.96	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090077d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.39	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090045d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.41	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090077d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.57	0.78	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090045d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.58	0.67	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-0-1.5

Lab ID: 0812177-3

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 188 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.34	0.54	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-0-1.5

Lab ID: 0812177-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 188 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.58	1.0	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-1.5-3.0

Lab ID: 0812177-4

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090054d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.66	0.95	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-0-1.5

Lab ID: 0812177-5

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.44	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-0-1.5

Lab ID: 0812177-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.59	0.91	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-1.5-3.0

Lab ID: 0812177-6

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 208 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.49	0.51	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-1.5-3.0

Lab ID: 0812177-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 208 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.65	0.92	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-0-1.5

Lab ID: 0812177-7

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 186 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.46	0.54	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-0-1.5

Lab ID: 0812177-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 186 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.56	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-1.5-3.0

Lab ID: 0812177-8

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 109 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090060d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.62	0.96	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-0-1.5

Lab ID: 0812177-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 104 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090061d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.61	1.0	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-1.5-3.0

Lab ID: 0812177-10

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090090d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.42	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-1.5-3.0

Lab ID: 0812177-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090090d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.59	0.78	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-1-3

Lab ID: 0812177-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.8 +/- 0.78	1.3	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P07-0-1
Lab ID:	0812177-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090018d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.8 +/- 0.69	0.90	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-04-0-1.5
Lab ID:	0812177-14

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 85.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090055d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.81	1.6	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-1.5-3.0

Lab ID: 0812177-15

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 84.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090062d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.84	1.5	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-Q09-1-3

Lab ID: 0812177-16

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090046d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.35	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-Q09-1-3

Lab ID: 0812177-16

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090046d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.54	0.69	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-09-0-1.5
Lab ID:	0812177-17

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 88.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090080d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.59	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CD-SD-09-1.5-3.0

Lab ID: 0812177-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 109 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090019d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.45	0.79	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P12-1-3
Lab ID:	0812177-19

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090056d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.0	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3

Lab ID: 0812177-19DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 91.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090066d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.45	0.83	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5

Lab ID: 0812177-20

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 101 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090023d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.62	0.85	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812177

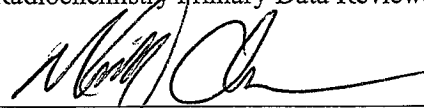
1. This report consists of the analytical results for 20 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to possible matrix interference, all samples were prepared at a reduced aliquot of ~1 g. Due to high activity detected in the prescreen, samples 0812177-8, -10, -11, -12, and -14 were prepared at a reduced aliquot of ~0.5 g and ~0.25 g for samples -13 and -20.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 02/10/09.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. The requested MDC of 0.1 pCi/gram was not met for U-234 and U-238 for several samples. The reported activity for these samples is greater than the achieved MDC. These samples are identified with an "M3" flag on the final reports.
7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Linda Arend
Radiochemistry Primary Data Reviewer

02/16/09
Date


Radiochemistry Final Data Reviewer
FOR
JOHN
PETROVIC

02/16/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812177

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-SD-01-0-1.5	0812177-1		SOIL	16-Jul-08	8:30
CP-SD-01-1.5-3.0	0812177-2		SOIL	16-Jul-08	8:30
CP-SD-02-0-1.5	0812177-3		SOIL	16-Jul-08	9:08
CP-SD-02-1.5-3.0	0812177-4		SOIL	16-Jul-08	9:08
CP-SD-06-0-1.5	0812177-5		SOIL	16-Jul-08	9:26
CP-SD-06-1.5-3.0	0812177-6		SOIL	16-Jul-08	9:26
CP-SD-05-0-1.5	0812177-7		SOIL	16-Jul-08	9:45
CP-SD-05-1.5-3.0	0812177-8		SOIL	16-Jul-08	9:45
CP-SD-03-0-1.5	0812177-9		SOIL	16-Jul-08	9:54
CP-SD-03-1.5-3.0	0812177-10		SOIL	16-Jul-08	9:54
CP-P07-1-3	0812177-11		SOIL	17-Jul-08	14:04
CP-P07-0-1	0812177-12		SOIL	17-Jul-08	14:04
CP-P07-5-7	0812177-13		SOIL	17-Jul-08	14:11
CP-SD-04-0-1.5	0812177-14		SOIL	17-Jul-08	14:52
CP-SD-04-1.5-3.0	0812177-15		SOIL	17-Jul-08	14:52
CP-Q09-1-3	0812177-16		SOIL	23-Jul-08	10:15
CP-SD-09-0-1.5	0812177-17		SOIL	28-Jul-08	10:39
CD-SD-09-1.5-3.0	0812177-18		SOIL	28-Jul-08	10:39
CP-P12-1-3	0812177-19		SOIL	23-Jul-08	11:03
OD-SD-02-0-1.5	0812177-20		SOIL	28-Jul-08	11:11



**PARAGON
ANALYTICS**

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 1 of 2

Project Name/No.: FMI-VIRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due _____) Dispose: Date 12/15/08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: Steven.Vaughn@paragoncorp.com

Company: Freeport McMoran

Address: Green Valley, AZ 85614

6200 W Duval Ave Rd.

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-SD-01-0-1.5	7/16/08	830	①	S	n/a	1
CP-SD-01-1.5-3.0	7/16/08	830	②	S	n/a	1
CP-SD-02-0-1.5	7/16/08	908	③	S	n/a	1
CP-SD-02-1.5-3.0	7/16/08	908	④	S	n/a	1
CP-SD-06-0-1.5	7/16/08	926	⑤	S	n/a	1
CP-SD-06-1.5-3.0	7/16/08	926	⑥	S	n/a	1
CP-SD-05-0-1.5	7/16/08	945	⑦	S	n/a	1
CP-SD-05-1.5-3.0	7/16/08	945	⑧	S	n/a	1
CP-SD-03-0-1.5	7/16/08	954	⑨	S	n/a	1
CP-SD-03-1.5-3.0	7/16/08	954	⑩	S	n/a	1

* Time Zone: EST CST MST PST		Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter	
Comments: Order No. 0548 VT			
Trk # 7971 87199884			
Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K. Walsh</u>	Signature _____		
Printed Name <u>Kevin Walsh</u>	Printed Name _____		
Date <u>12/15/08</u>	Date _____		
Time <u>1600</u>	Time _____		
Company <u>URS</u>	Company _____		
Received By: (1)		Received By: (2)	
Signature <u>Cheryl Trimble</u>	Signature _____		
Printed Name <u>Cheryl Trimble</u>	Printed Name _____		
Date <u>12-17-08</u>	Date _____		
Time <u>1045</u>	Time _____		
Company <u>ALS Paragon</u>	Company _____		



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 2 of 2

Project Name/No.: FMI-VLP	Sampler(s): K. Walsh	Turnaround (circle one): Standard	Rush (Due Date 60 day or Return to Client)
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: E-mail: Steven.Vaughn@urcorp.com Company: Freepoint Mc Moran Address: 6200 W Duval Ave Rd. Green Valley, AZ 85614			
Sample ID	Date	Time *	No. of Containers
CP-P07-1-3	7/17/08	1404	1
CP-P07-0-1	7/17/08	1404	1
CP-P07-S-7	7/17/08	1411	1
CP-SD-04-0-1-5	7/17/08	1452	1
CP-SD-04-1-5-3-0	7/17/08	1452	1
CP-Q09-1-3	7/23/08	1015	1
CP-SD-09-0-1-5	7/28/08	1034	1
CP-SD-09-1-5-3-0	7/28/08	1039	1
CP-P12-1-3	7/23/08	1103	1
OD-SD-02-0-1-5	7/23/08	1111	1
Circle method (right); provide additional information as needed (comments).			
VOCS	SW8260B	BTEX (only)	SVOCs
OC Pesticides	SW8081A	PCBs	Herbicides
Explosives	SW8330	TCLP Organics SW1311	TCLP Metals SW1311 Hg
Total Metals by ICP/Hg	SW6010B 7470 7471 E200.7	Dissolved Metals by ICP/Hg	Total Metals by ICP/MS
Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	pH
Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /
Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0
Radium 226	E903.1	Radium 228	SW9320 E904.0
Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1
Radon 222	SM7510Rn	Micrium Isotopes	234, 235, 238
Relinquished By: Signature _____ Printed Name _____ Date _____ Time _____ Company _____			
Received By: Signature _____ Printed Name _____ Date _____ Time _____ Company _____			
Comments: Order No. 0508VT			
Trk # 7971 87199884			

Paragon Analytics

Workorder No: 0812177

Initials: CDT Date: 12-17-08

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Project Manager Signature / Date: AK 12/20/00

*R Gun #4: Oakton. SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/20/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

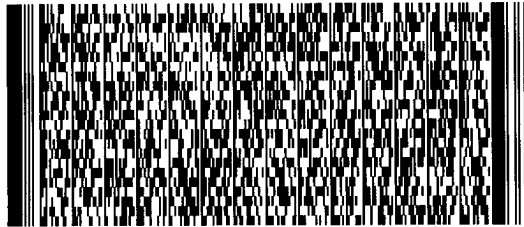
Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #



LL10180

1-7/1

4 of 4 WED - 17DEC AA
STANDARD OVERNIGHT

MPS# 7971 8719 9884

0263

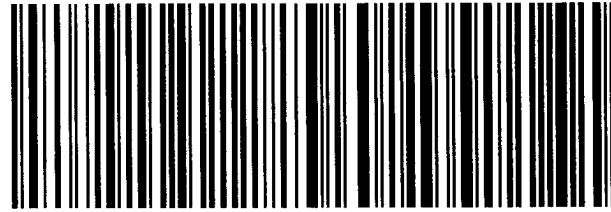
Mstr# 7971 8719 9690 0201

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80524

CO-US

DEN

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090129-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jan-09

Date Prepared: 29-Jan-09

Date Analyzed: 10-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 1000 minutes

Final Aliquot: 0.830 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.015 +/- 0.018	0.028	0.1	U
15117-96-1	U-235	0.010 +/- 0.016	0.027	0.1	U
7440-61-1	U-238	0.0043 +/- 0.019	0.036	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	5.442	4.59	pCi/g	84.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: AS090129-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jan-09

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Final Aliquot: 0.830 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	5.33 +/- 0.961	0.0714	5.23	102	82 - 122	P
7440-61-1	U-238	5.78 +/- 1.04	0.0477	5.43	106	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	5.443	4.47	pCi/g	82.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812177-1

Date Printed: Monday, February 16, 2009

ALS Paragon

LIMS Version: 6.245A

Page 1 of 1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.2 +/- 0.42	2.0 +/- 0.39	0.27	2.13	
15117-96-1	U-235	0.14 +/- 0.067	0.084 +/- 0.050	0.72	2.13	LT
7440-61-1	U-238	2.2 +/- 0.42	2.3 +/- 0.44	0.25	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5

Lab ID: 0812177-17DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.1 +/- 0.40	2.1 +/- 0.41	0.10	2.13	
15117-96-1	U-235	0.098 +/- 0.055	0.12 +/- 0.060	0.26	2.13	
7440-61-1	U-238	2.4 +/- 0.46	2.1 +/- 0.41	0.40	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-01-0-1.5
Lab ID:	0812177-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.031	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.036	0.1	
7440-61-1	U-238	1.5 +/- 0.31	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.418	3.58	pCi/g	81.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-01-1.5-3.0
Lab ID:	0812177-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.030	0.1	
15117-96-1	U-235	0.14 +/- 0.067	0.042	0.1	
7440-61-1	U-238	2.2 +/- 0.42	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.447	3.63	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.029	0.1	
15117-96-1	U-235	0.084 +/- 0.050	0.035	0.1	LT
7440-61-1	U-238	2.3 +/- 0.44	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.412	3.66	pCi/g	83.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-02-0-1.5
Lab ID:	0812177-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.014	0.1	
15117-96-1	U-235	0.092 +/- 0.051	0.033	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.461	4.09	pCi/g	91.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-02-1.5-3.0
Lab ID:	0812177-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.27	0.046	0.1	
15117-96-1	U-235	0.043 +/- 0.039	0.023	0.1	LT
7440-61-1	U-238	1.2 +/- 0.27	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	2.81	pCi/g	62.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-06-0-1.5
Lab ID:	0812177-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.037	0.1	
15117-96-1	U-235	0.095 +/- 0.052	0.039	0.1	LT
7440-61-1	U-238	1.9 +/- 0.37	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.448	4.03	pCi/g	90.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-06-1.5-3.0
Lab ID:	0812177-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.034	0.1	
15117-96-1	U-235	0.11 +/- 0.056	0.034	0.1	
7440-61-1	U-238	1.9 +/- 0.36	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	4.04	pCi/g	89.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-0-1.5	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 1.01 g
Lab ID: 0812177-7	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 16-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 04-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.40	0.050	0.1	
15117-96-1	U-235	0.15 +/- 0.068	0.035	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.466	3.80	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-05-1.5-3.0
Lab ID:	0812177-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.507 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.49	0.10	0.1	
15117-96-1	U-235	0.098 +/- 0.076	0.038	0.1	LT
7440-61-1	U-238	1.9 +/- 0.44	0.11	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.913	7.30	pCi/g	82.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-03-0-1.5
Lab ID:	0812177-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.98 +/- 0.23	0.049	0.1	
15117-96-1	U-235	0.075 +/- 0.051	0.053	0.1	LT
7440-61-1	U-238	1.1 +/- 0.25	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.65	pCi/g	81.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-03-1.5-3.0
Lab ID:	0812177-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.514 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.42	0.13	0.1	M3
15117-96-1	U-235	0.097 +/- 0.080	0.097	0.1	U
7440-61-1	U-238	1.9 +/- 0.42	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.793	7.60	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P07-1-3
Lab ID:	0812177-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 0.501 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.52	0.10	0.1	M3
15117-96-1	U-235	0.19 +/- 0.11	0.040	0.1	
7440-61-1	U-238	2.6 +/- 0.56	0.089	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.016	7.69	pCi/g	85.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P07-0-1
Lab ID:	0812177-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.508 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.49	0.11	0.1	M3
15117-96-1	U-235	0.21 +/- 0.12	0.040	0.1	
7440-61-1	U-238	2.9 +/- 0.62	0.079	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.902	7.19	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P07-5-7
Lab ID:	0812177-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 10-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 1000 minutes
Report Basis: Dry Weight

Final Aliquot: 0.262 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.36	0.10	0.1	M3
15117-96-1	U-235	0.074 +/- 0.068	0.098	0.1	U
7440-61-1	U-238	1.8 +/- 0.35	0.11	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	17.26	14.7	pCi/g	84.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-0-1.5	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 0.500 g
Lab ID: 0812177-14	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 17-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 09-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.42	0.059	0.1	
15117-96-1	U-235	0.097 +/- 0.075	0.069	0.1	LT
7440-61-1	U-238	2.1 +/- 0.46	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.034	7.72	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-04-1.5-3.0
Lab ID:	0812177-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.031	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.036	0.1	
7440-61-1	U-238	1.3 +/- 0.27	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.455	3.57	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-Q09-1-3
Lab ID:	0812177-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.26	0.036	0.1	
15117-96-1	U-235	0.020 +/- 0.025	0.018	0.1	LT
7440-61-1	U-238	1.2 +/- 0.25	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.505	3.63	pCi/g	80.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-09-0-1.5
Lab ID:	0812177-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.40	0.041	0.1	
15117-96-1	U-235	0.098 +/- 0.055	0.043	0.1	LT
7440-61-1	U-238	2.4 +/- 0.46	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.480	3.72	pCi/g	83.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5

Lab ID: 0812177-17DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.036	0.1	
15117-96-1	U-235	0.12 +/- 0.060	0.035	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.414	3.68	pCi/g	83.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CD-SD-09-1.5-3.0
Lab ID:	0812177-18

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.051	0.1	
15117-96-1	U-235	0.072 +/- 0.046	0.035	0.1	LT
7440-61-1	U-238	1.7 +/- 0.34	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.388	3.63	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 1.02 g
Lab ID: 0812177-19	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 23-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 06-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.91 +/- 0.21	0.049	0.1	
15117-96-1	U-235	0.041 +/- 0.034	0.019	0.1	LT
7440-61-1	U-238	0.84 +/- 0.20	0.055	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.446	3.70	pCi/g	83.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 0.252 g
Lab ID: 0812177-20	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 1000 minutes	Result Units: pCi/g
	Date Analyzed: 10-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.16	0.1	M3
15117-96-1	U-235	0.060 +/- 0.058	0.080	0.1	U
7440-61-1	U-238	1.9 +/- 0.38	0.10	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	17.95	14.4	pCi/g	80.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

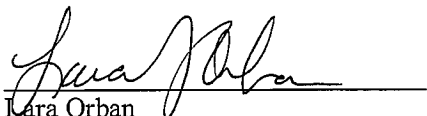
Freeport McMoRan Sierrita

FMI-VRP

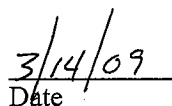
Work Order Number: 0812177

1. This report consists of the analytical results for thirteen soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/12/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

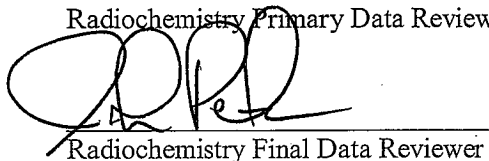
The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban

Radiochemistry Primary Data Reviewer


Date

3/14/09


Radiochemistry Final Data Reviewer


Date

03/15/09

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812177

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-SD-01-0-1.5	0812177-1		SOIL	16-Jul-08	8:30
CP-SD-03-1.5-3.0	0812177-10		SOIL	16-Jul-08	9:54
CP-P07-1-3	0812177-11		SOIL	17-Jul-08	14:04
CP-P07-0-1	0812177-12		SOIL	17-Jul-08	14:04
CP-P07-5-7	0812177-13		SOIL	17-Jul-08	14:11
CP-SD-04-0-1.5	0812177-14		SOIL	17-Jul-08	14:52
CP-SD-04-1.5-3.0	0812177-15		SOIL	17-Jul-08	14:52
CP-Q09-1-3	0812177-16		SOIL	23-Jul-08	10:15
CP-SD-09-0-1.5	0812177-17		SOIL	28-Jul-08	10:39
CD-SD-09-1.5-3.0	0812177-18		SOIL	28-Jul-08	10:39
CP-P12-1-3	0812177-19		SOIL	23-Jul-08	11:03
CP-SD-01-1.5-3.0	0812177-2		SOIL	16-Jul-08	8:30
OD-SD-02-0-1.5	0812177-20		SOIL	28-Jul-08	11:11
CP-SD-02-0-1.5	0812177-3		SOIL	16-Jul-08	9:08
CP-SD-02-1.5-3.0	0812177-4		SOIL	16-Jul-08	9:08
CP-SD-06-0-1.5	0812177-5		SOIL	16-Jul-08	9:26
CP-SD-06-1.5-3.0	0812177-6		SOIL	16-Jul-08	9:26
CP-SD-05-0-1.5	0812177-7		SOIL	16-Jul-08	9:45
CP-SD-05-1.5-3.0	0812177-8		SOIL	16-Jul-08	9:45
CP-SD-03-0-1.5	0812177-9		SOIL	16-Jul-08	9:54



**PARAGON
ANALYTICS**

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 1 of 2

Project Name/No.: FMI-VIRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: Date 12/15/08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: Steven.Vaughn@paragoncorp.com

Company: Freeport McMoran

Address: Green Valley, AZ 85614

6200 W Duval Ave Rd.

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-SD-01-0-1.5	7/16/08	830	①	S	n/a	1
CP-SD-01-1.5-3.0	7/16/08	830	②	S	n/a	1
CP-SD-02-0-1.5	7/16/08	908	③	S	n/a	1
CP-SD-02-1.5-3.0	7/16/08	908	④	S	n/a	1
CP-SD-06-0-1.5	7/16/08	926	⑤	S	n/a	1
CP-SD-06-1.5-3.0	7/16/08	926	⑥	S	n/a	1
CP-SD-05-0-1.5	7/16/08	945	⑦	S	n/a	1
CP-SD-05-1.5-3.0	7/16/08	945	⑧	S	n/a	1
CP-SD-03-0-1.5	7/16/08	954	⑨	S	n/a	1
CP-SD-03-1.5-3.0	7/16/08	954	⑩	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter		Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K. Walsh</u>		Signature _____		Signature _____	
Printed Name <u>Kevin Walsh</u>		Printed Name _____		Printed Name _____	
Date <u>12/15/08</u>		Date _____		Date _____	
Time <u>1600</u>		Time _____		Time _____	
Company <u>URS</u>		Company _____		Company _____	
Received By: <u>Cheryl Trimble</u>		Received By: _____		Received By: _____	
Signature _____		Signature _____		Signature _____	
Printed Name <u>Cheryl Trimble</u>		Printed Name _____		Printed Name _____	
Date <u>12-17-08</u>		Date _____		Date _____	
Time <u>1045</u>		Time _____		Time _____	
Company <u>ALS Paragon</u>		Company _____		Company _____	

Order No. 0548 VT

Trk # 7971 87199884



Chain-of-Custody

LABID 0812177

800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Date: 12/15/08 Page 2 of 2

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers
CP-P07-1-3	7/17/08	1404	11	S	n/a	1
CP-P07-0-1	7/17/08	1404	12	S	n/a	1
CP-P07-5-7	7/17/08	1411	13	S	n/a	1
CP-S01-04-0-1.5	7/17/08	1452	14	S	n/a	1
CP-S01-04-1.5-3.0	7/17/08	1452	15	S	n/a	1
CP-Q09-1-3	7/23/08	1015	16	S	n/a	1
CP-S01-09-0-1.5	7/28/08	1034	17	S	n/a	1
CP-S01-09-1.5-3.0	7/28/08	1039	18	S	n/a	1
CP-P12-1-3	7/23/08	1103	19	S	n/a	1
OD-S01-02-0.15	7/23/08	1111	20	S	n/a	1

* Time Zone: EST CST MST PST

Comments:

Order No. 0508VT

Tik # 7971 2865128

4.

Form 202r6 v1c (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812177Project Manager: JEInitials: COT Date: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO / NA (If no. see Form 008.)		

DOT
Survey/
Acceptance
Information

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO ☒ NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE 12/20/08

*IR Gun #2: Oakton, SN 29922500201-0066

IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/20/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

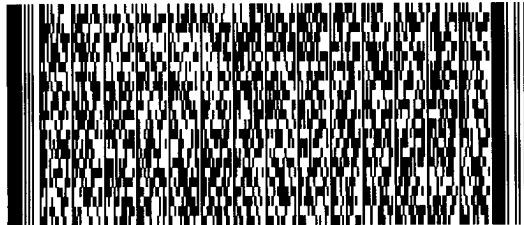
Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

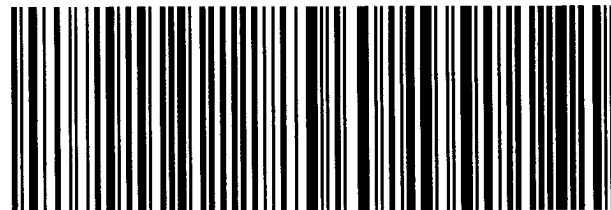


4 of 4
 MPS# 7971 8719 9884
 0263
 Mstr# 7971 8719 9690 0201

WED - 17DEC AA
STANDARD OVERNIGHT

80524
CO-US
DEN

XH FTCA



LL10180
 1-71

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3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-1MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.14 +/- 0.24	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-4MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.16 +/- 0.38	0.72	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-4LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	47.5 +/- 8.69	0.366	44.6	107	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	48.8 +/- 9.05	0.403	43.3	113	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5

Lab ID: 0812177-1DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 16-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.1 +/- 0.61	1.8 +/- 0.50	0.32	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-1	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 16-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.61	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5

Lab ID: 0812177-1DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 16-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.50	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-02-1.5-3.0	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-4	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 16-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.47	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-05-1.5-3.0	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-8	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 16-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.61	0.060	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-SD-03-0-1.5
Lab ID:	0812177-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 16-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.79	0.094	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P07-1-3	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.02 g
Lab ID: 0812177-11	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 17-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.8 +/- 1.2	0.71	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P07-0-1
Lab ID:	0812177-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.69	0.30	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P07-5-7
Lab ID:	0812177-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.44	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-04-0-1.5	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.00 g
Lab ID: 0812177-14	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 17-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.77 +/- 0.31	0.065	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-SD-04-1.5-3.0
Lab ID:	0812177-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.49	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-17	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.76	0.26	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CD-SD-09-1.5-3.0	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-18	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.55	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-19	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 23-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.65	0.58	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5	Sample Matrix: SOIL	Prep Batch: RE090220-1	Final Aliquot: 1.02 g
Lab ID: 0812177-20	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-1-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: RE090220-1A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 11-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.61	0.58	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812177

1. This report consists of the analytical results for one soil sample received by ALS Paragon on 12/17/08.
2. This sample was prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in these samples.
3. The sample was analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analysis was completed on 01/29/09.
4. The analysis results for this sample are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil sample from this work order was initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. ICP-AES measurement of barium concentrations prior to chemical separation for sample 0812177-13 showed concentrations less than the amount known to have been added to the sample in the form of barium carrier. To avoid a low bias in the final analytical results the known concentration of the carrier was used in chemical yield calculations in lieu of the pre-separation measurement.
7. No further anomalous situations were noted during the preparation and analysis of this sample. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Lara Orban

Radiochemistry Primary Data Reviewer

2/13/09

Date

Radiochemistry Final Data Reviewer

02/16/09

Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812177

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-SD-01-0-1.5	0812177-1		SOIL	16-Jul-08	8:30
CP-SD-01-1.5-3.0	0812177-2		SOIL	16-Jul-08	8:30
CP-SD-02-0-1.5	0812177-3		SOIL	16-Jul-08	9:08
CP-SD-02-1.5-3.0	0812177-4		SOIL	16-Jul-08	9:08
CP-SD-06-0-1.5	0812177-5		SOIL	16-Jul-08	9:26
CP-SD-06-1.5-3.0	0812177-6		SOIL	16-Jul-08	9:26
CP-SD-05-0-1.5	0812177-7		SOIL	16-Jul-08	9:45
CP-SD-05-1.5-3.0	0812177-8		SOIL	16-Jul-08	9:45
CP-SD-03-0-1.5	0812177-9		SOIL	16-Jul-08	9:54
CP-SD-03-1.5-3.0	0812177-10		SOIL	16-Jul-08	9:54
CP-P07-1-3	0812177-11		SOIL	17-Jul-08	14:04
CP-P07-0-1	0812177-12		SOIL	17-Jul-08	14:04
CP-P07-5-7	0812177-13		SOIL	17-Jul-08	14:11
CP-SD-04-0-1.5	0812177-14		SOIL	17-Jul-08	14:52
CP-SD-04-1.5-3.0	0812177-15		SOIL	17-Jul-08	14:52
CP-Q09-1-3	0812177-16		SOIL	23-Jul-08	10:15
CP-SD-09-0-1.5	0812177-17		SOIL	28-Jul-08	10:39
CD-SD-09-1.5-3.0	0812177-18		SOIL	28-Jul-08	10:39
CP-P12-1-3	0812177-19		SOIL	23-Jul-08	11:03
OD-SD-02-0-1.5	0812177-20		SOIL	28-Jul-08	11:11



**PARAGON
ANALYTICS**

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID 0812177

Date: 12/15/08 Page 1 of 2

Project Name/No.: FMI-VIRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due _____) Dispose: Date 12/15/08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: Steven.Vaughn@paragoncorp.com

Company: Freeport McMoran

Address: Green Valley, AZ 85614

6200 W Duval Ave Rd.

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-SD-01-0-1.5	7/16/08	830	①	S	n/a	1
CP-SD-01-1.5-3.0	7/16/08	830	②	S	n/a	1
CP-SD-02-0-1.5	7/16/08	908	③	S	n/a	1
CP-SD-02-1.5-3.0	7/16/08	908	④	S	n/a	1
CP-SD-06-0-1.5	7/16/08	926	⑤	S	n/a	1
CP-SD-06-1.5-3.0	7/16/08	926	⑥	S	n/a	1
CP-SD-05-0-1.5	7/16/08	945	⑦	S	n/a	1
CP-SD-05-1.5-3.0	7/16/08	945	⑧	S	n/a	1
CP-SD-03-0-1.5	7/16/08	954	⑨	S	n/a	1
CP-SD-03-1.5-3.0	7/16/08	954	⑩	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter		Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K. Walsh</u>		Signature _____		Signature _____	
Printed Name <u>Kevin Walsh</u>		Printed Name _____		Printed Name _____	
Date <u>12/15/08</u>		Date _____		Date _____	
Time <u>1600</u>		Time _____		Time _____	
Company <u>URS</u>		Company _____		Company _____	
Received By: <u>Cheryl Trimble</u>		Received By: _____		Received By: _____	
Signature _____		Signature _____		Signature _____	
Printed Name <u>Cheryl Trimble</u>		Printed Name _____		Printed Name _____	
Date <u>12-17-08</u>		Date _____		Date _____	
Time <u>1045</u>		Time _____		Time _____	
Company <u>ALS Paragon</u>		Company _____		Company _____	

Order No. 0548 VT

Trk # 7971 87199884



Chain-of-Custody

LABID 0812177

800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Date: 12/15/08 Page 2 of 2

Green Valley, AZ 85614

Circle method (right): provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: ... HCl, etc.)	No. of Containers
CP-P07-1-3	7/17/08	1404	(11)	S	n/a	1
CP-P07-0-1	7/17/08	1404	(13)	S	n/a	1
CP-P07-5-7	7/17/08	1411	(13)	S	n/a	1
CP-SD-04-0-1.5	7/17/08	1452	(14)	S	n/a	1
CP-SD-04-1.5-3.0	7/17/08	1452	(15)	S	n/a	1
CP-Q09-1-3	7/23/08	1015	(16)	S	n/a	1
CP-SD-09-0-1.5	7/28/08	1034	(17)	S	n/a	1
CP-SD-09-1.5-3.0	7/28/08	1039	(18)	S	n/a	1
CP-P12-1-3	7/23/08	1103	(19)	S	n/a	1
OD-SD-02-0.15	7/23/08	1111	(20)	S	n/a	1

*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-
Comments:

Order No. 0508VT

Ik # 7971 87199884

5

Form 2026 v1s (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812177Project Manager: JEInitials: COTDate: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO / NA (If no. see Form 008.)		

DOT
Survey/
Acceptance
Information

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO ☒ NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE 12/20/08

*IR Gun #2: Oakton, SN 29922500201-0066

IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/20/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

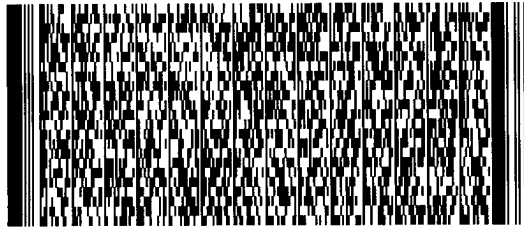
Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

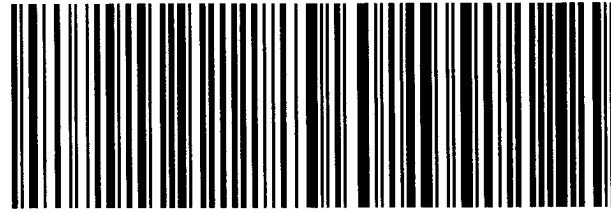


4 of 4
 MPS# 7971 8719 9884
 0263
 Mstr# 7971 8719 9690 0201

WED - 17DEC AA
STANDARD OVERNIGHT

80524
CO-US
DEN

XH FTCA



LL10180
 1-71

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812177-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812177-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P07-5-7
Lab ID:	0812177-13

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 17-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.508 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 1.8	2.8	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	32900	ug	93.4	40 - 110 %	
YTTRIUM	8713	5480	ug	62.9	40 - 110 %	
Total				58.7	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812177-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita FMI-VRP

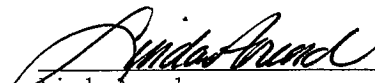
Work Order Number: 0812178

1. The following report consists of analytical results for 16 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812178-1, -9, -11, -13, -15, -16, -18, and -18DUP were sealed in steel cans on 12/24/08 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/15/09 is at least 97.8%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.9%. The remaining samples in the work order were packed in standard 100 gram geometry and analyzed for ^{228}Ra only.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/15/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volumes were insufficient to allow preparation of duplicates. A duplicate analysis of samples 0812178-5 and -18 was performed in lieu of prepared duplicates.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples.
7. The library used for calibration and analysis for samples 0812178-1, -9, -11, -13, -15, -16, -18, and -18DUP employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium.

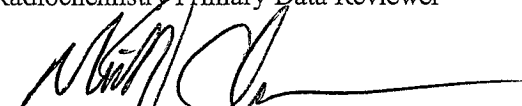


8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. Due to the nature of electronics involved in gamma spectroscopy, any detector acquiring data with the same multi-channel buffer (MCB) is affected by all other detector inputs in that same MCB. A high activity calibration source was counting in detector 4, which is in the same MCB as detector 3. GS090106-3LCS was counted in detector 3 on 01/13/09. Thus, the observed dead time for this sample count was greater than 10% at 10.63%. Analyst review of the data does not indicate a problem with the spectral acquisition for this sample. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. Results are submitted without further qualification. Please refer to QASS 360430.
11. The requested detection limit of 1 pCi/gram for ^{228}Ra was not met for samples 0812178-1, -3, -4, -5, -5DUP, -6, and -15, as identified with an "M3" qualifier on the final reports. The reported activity for these samples is greater than the achieved detection limit. Results are submitted without further qualification.
12. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Linda Arend
Radiochemistry Primary Data Reviewer

02/05/09
Date


Radiochemistry Final Data Reviewer

02/06/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812178

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-02-1-3	0812178-1		SOIL	11-Jul-08	13:20
CP-O09-0-1	0812178-2		SOIL	11-Jul-08	14:52
CP-O09-1-3	0812178-3		SOIL	11-Jul-08	14:52
CP-O09-5-7	0812178-4		SOIL	11-Jul-08	14:58
CP-O09-10-12	0812178-5		SOIL	11-Jul-08	15:02
CP-O09-15-17	0812178-6		SOIL	11-Jul-08	15:10
CP-JS-01-0-1	0812178-7		SOIL	15-Jul-08	9:45
CP-JS-01-1-3	0812178-8		SOIL	15-Jul-08	9:45
CP-JS-01-5-7	0812178-9		SOIL	15-Jul-08	9:55
CP-P04-0-1	0812178-10		SOIL	15-Jul-08	11:10
CP-P04-1-3	0812178-11		SOIL	15-Jul-08	11:21
CP-P05-0-1	0812178-12		SOIL	15-Jul-08	13:15
CP-P05-1-3	0812178-13		SOIL	15-Jul-08	13:33
CP-JS-01-10-12	0812178-14		SOIL	15-Jul-08	10:40
EV-JS-01-5-7	0812178-15		SOIL	14-Jul-08	13:55
EV-JS-02-1-3	0812178-16		SOIL	14-Jul-08	14:45
EV-JS-02-0-1	0812178-17		SOIL	14-Jul-08	14:45
EV-JS-02-5-7	0812178-18		SOIL	14-Jul-08	14:55



225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID) 0812178 Page 1 of 1

Chain-of-Custody Date 12/15/07

Originator: Retain pink copy!

Fax: (505) 424-2012
E-mail: Steven_Vaughn@uscorp.com
Company: Freeport Mc.Moran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 856

~~Standard Dr Rush (Due~~

Disposer: _____ Date: _____ days or Return to Client

Date:

or Return to Client

Report To: Steven Vaughan
Phone: (520) 407-2845
Fax:
E-mail: steven-vaughn@ufscorp.com
Company: Freeport Mc.Moran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right): provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type, HCl, etc.)	No. of Containers
CP-JS-02-1-3	7/1/08	1320	①	S	n/a	1
CP-049-0-1	7/1/08	1452	②	S	n/a	1
CP-049-1-3	7/1/08	1452	③	S	n/a	1
CP-049-5-7	7/1/08	1458	④	S	n/a	1
CP-049-10-12	7/1/08	1502	⑤	S	n/a	1
CP-049-15-17	7/1/08	1510	⑥	S	n/a	1
CP-JS-01-0-1	7/15/08	945	⑦	S	n/a	1
CP-JS-01-1-3	7/15/08	945	⑧	S	n/a	1
CP-JS-01-5-7	7/15/08	955	⑨	S	n/a	1
CP-P44-0-1	7/15/08	1100	⑩	S	n/a	1

* Time Zone: EST CST MST PST **Matrix Key:** O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Comments:

order no. 0548VT

T-1 # 7971 8719 9690

Relinquished By: Kalish
Signature Kalish
Printed Name Kevin Walsh
Date 12/15/08 Time 1600
Company URS

Relinquished By: _____
Signature _____
Printed Name _____
Date _____
Company _____

Received By: Cheryl Trimble
Signature: Cheryl Trimble
Printed Name: Cheryl Trimble
Date: 12-17-08 Time: 1045
Company: ALS Paragon

Received By: _____
Signature _____
Printed Name _____
Date _____
Company _____



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812178

Date: 12/16/08 Page 2 of 2

Project Name/No.: FMI-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2843

Fax:

E-mail: steven_vaughn@fmi.com
Company: Freepoint Mc Meron
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Maximum Isotope
CP-P04-1-3	7/5/08	1121	11	S	n/a	1																													X
CP-P05-0-1	7/5/08	1315	12	S	n/a	1																													X
CP-P05-1-3	7/5/08	1333	13	S	n/a	1																													X
CP-JS-01-10-12	7/5/08	1040	14	S	n/a	1																													X
EV-JS-01-5-7	7/4/08	1355	15	S	n/a	1																													X
EV-JS-02-1-3	7/4/08	1445	16	S	n/a	1																													X
EV-JS-02-0-1	7/4/08	1445	17	S	n/a	1																													X
EV-JS-02-5-7	7/4/08	1455	18	S	n/a	1																													X

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments: Order No. 0548VT

Relinquished By: (1)
Signature: Kevin Walsh
Printed Name: Kevin Walsh
Date: 12/16/08 Time: 1600
Company: ALS

Relinquished By: (2)
Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

Received By: (1)
Signature: Cheryl Trimble
Printed Name: Cheryl Trimble
Date: 12-17-08 Time: 1045
Company: ALS Paragon

Received By: (2)
Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

Trk # 7971 8719 9690

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FREEDORTWorkorder No: 0812178Project Manager: JEInitials: CDT Date: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF <input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <input checked="" type="radio"/> <u>#4</u> <input checked="" type="radio"/> RAD ONLY	YES	<input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>15</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/26/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 16 IN

15.1

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

1 of 4

WED - 17DEC

AA

STANDARD OVERNIGHT

TRK# 7971 8719 9690
 0201

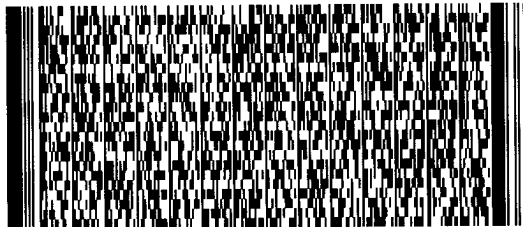
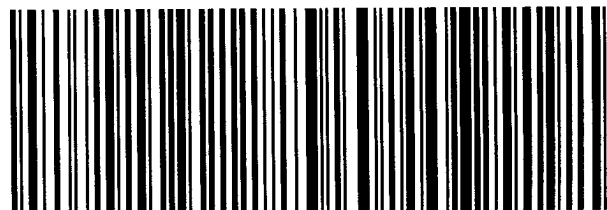
MASTER

80524

CO-US

DEN

XH FTCA



After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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QUALITY ASSURANCE SUMMARY SHEET

PAR W.O. # / BATCH

0812176, 177, 178, 212 /
65090106-3

TEST

5-SCAN

METHOD

5-SPEC

SOP/REV (PREP)

—

SOP/REV (ANAL)

713

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

MC
01/28/09

The laboratory control sample GS090106-3LCS was counted on 1/13/09 in detector 3. The observed dead time for the count of the laboratory control sample was greater than 10%, at 10.63%. During the spectral acquisition of this source, a high activity calibration source was counting in detector 4. This detector is in the same multi-channel buffer (MCB) as detector 3. Due to the nature of the electronics involved in gamma spectroscopy, any detector acquiring data within the same MCB is affected by all other detector inputs in that MCB. Thus, the source activity in detector 4 caused an increase in the dead time observed for the entire MCB containing detectors 3 and 4. Analyst review of the raw data does not indicate any problems with the spectral acquisition for these samples. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. All data quality objectives were met and the results are submitted without further qualification.

MC
01/28/09

MC
01/28/09

MC
01/28/09

MC
01/28/09

TECHNICIAN/ANALYST

DATE 01/28/09

DEPARTMENT MANAGER

DATE 1/28/09

1C108C360430

FORM 302r6.doc (4/22/04)

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3MB

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 195 g

Result Units: pCi/g

File Name: 090052d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.093 +/- 0.20	0.34	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 45 minutes

Final Aliquot: 94.1 g

Result Units: pCi/g

File Name: 090060d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.20 +/- 0.34	0.59	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 195 g

Result Units: pCi/g

File Name: 090052d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.17 +/- 0.37	0.76	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-4MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 60 minutes

Final Aliquot: 89.4 g

Result Units: pCi/g

File Name: 090094d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.0036 +/- 0.26	0.50	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090067d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1020 +/- 120	14.2	986	103	85 - 115	P
10198-40-0	Co-60	454 +/- 53.2	1.41	457	99.3	85 - 115	P
10045-97-3	Cs-137	404 +/- 47.4	1.87	374	108	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-4LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090062d07

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1060 +/- 125	11.5	986	108	85 - 115	P
10198-40-0	Co-60	501 +/- 58.7	3.84	457	110	85 - 115	P
10045-97-3	Cs-137	406 +/- 47.7	2.52	374	109	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3ALCS

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090086d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	451 +/- 52.9	2.97	470	96.0	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090097d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	486 +/- 58.1	12.4	462	105	85 - 115	P
10198-40-0	Co-60	213 +/- 25.0	0.839	214	99.3	85 - 115	P
10045-97-3	Cs-137	177 +/- 20.8	1.22	175	101	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812178-1

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-5-7
Lab ID: 0812178-18DUP

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 14-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 171 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090053d08A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.6 +/- 0.48	2.5 +/- 0.45	0.14	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-10-12
Lab ID: 0812178-5DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Jul-08
Date Prepared: 30-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4
QCBatchID: GS090106-4-1
Run ID: GS090106-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 102 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090062d02

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.9 +/- 0.67	2.2 +/- 0.57	0.35	2.13	M3

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-5-7
Lab ID: 0812178-18DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 14-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 171 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090053d08

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.9 +/- 0.58	1.8 +/- 0.56	0.17	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-02-1-3

Lab ID: 0812178-1

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 175 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090080d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.28	0.42	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-02-1-3

Lab ID: 0812178-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 175 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090080d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.63	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-O09-1-3
Lab ID:	0812178-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 91.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090059d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.64	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-O09-5-7
Lab ID:	0812178-4

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 95.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090050d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.77	1.4	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-O09-10-12

Lab ID: 0812178-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 102 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090065d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.1	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-10-12

Lab ID: 0812178-5DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 102 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090062d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.57	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-O09-15-17

Lab ID: 0812178-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 94.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090073d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.74	1.1	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-1-3

Lab ID: 0812178-8

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 101 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090087d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.64	0.98	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-5-7

Lab ID: 0812178-9

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090091d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.49	0.60	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-5-7

Lab ID: 0812178-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090091d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.57	0.77	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P04-0-1

Lab ID: 0812178-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 88.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090064d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.70	0.88	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P04-1-3
Lab ID:	0812178-11

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 200 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090047d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.35	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P04-1-3
Lab ID:	0812178-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 200 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090047d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.57	0.91	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P05-0-1
Lab ID:	0812178-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 111 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090075d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.63	0.94	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P05-1-3
Lab ID:	0812178-13

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 199 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090081d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.39	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P05-1-3
Lab ID:	0812178-13

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 199 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090081d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.52	0.72	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-10-12

Lab ID: 0812178-14

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 98.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090066d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.68	0.96	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-5-7

Lab ID: 0812178-15

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 188 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.2 +/- 0.76	0.64	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-5-7

Lab ID: 0812178-15

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 188 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.69	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-02-1-3
Lab ID:	0812178-16

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 193 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090048d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.43	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-1-3

Lab ID: 0812178-16

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 193 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090048d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.51	0.77	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-0-1

Lab ID: 0812178-17

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 92.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090063d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.56	0.84	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-5-7

Lab ID: 0812178-18

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 171 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090096d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.48	0.59	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-5-7
Lab ID: 0812178-18DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 171 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090053d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.45	0.57	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-02-5-7
Lab ID:	0812178-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 171 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090096d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.58	0.95	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-5-7
Lab ID: 0812178-18DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 171 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090053d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.56	0.94	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812178

1. This report consists of the analytical results for 18 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. To avoid possible matrix interference, an aliquot of ~1 g was taken for all the samples. Due to activity detected in the prescreen data, sample 0812178-15 was prepared at a reduced aliquot of ~0.5g.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 02/09/09.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. Uranium-234 activity is reported in the associated method blank above the minimum detectable concentration value, as indicated with a "B3" qualifier on the final report. The measured blank activity is below the requested MDC of 0.1 pCi/gram. Results are acceptable according to SOP715R15, and are submitted without further qualification.
7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

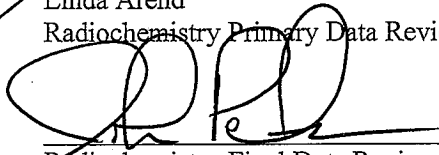


The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



Linda Arend
Radiochemistry Primary Data Reviewer

02/16/09
Date



Radiochemistry Final Data Reviewer

02/16/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812178

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-02-1-3	0812178-1		SOIL	11-Jul-08	13:20
CP-O09-0-1	0812178-2		SOIL	11-Jul-08	14:52
CP-O09-1-3	0812178-3		SOIL	11-Jul-08	14:52
CP-O09-5-7	0812178-4		SOIL	11-Jul-08	14:58
CP-O09-10-12	0812178-5		SOIL	11-Jul-08	15:02
CP-O09-15-17	0812178-6		SOIL	11-Jul-08	15:10
CP-JS-01-0-1	0812178-7		SOIL	15-Jul-08	9:45
CP-JS-01-1-3	0812178-8		SOIL	15-Jul-08	9:45
CP-JS-01-5-7	0812178-9		SOIL	15-Jul-08	9:55
CP-P04-0-1	0812178-10		SOIL	15-Jul-08	11:10
CP-P04-1-3	0812178-11		SOIL	15-Jul-08	11:21
CP-P05-0-1	0812178-12		SOIL	15-Jul-08	13:15
CP-P05-1-3	0812178-13		SOIL	15-Jul-08	13:33
CP-JS-01-10-12	0812178-14		SOIL	15-Jul-08	10:40
EV-JS-01-5-7	0812178-15		SOIL	14-Jul-08	13:55
EV-JS-02-1-3	0812178-16		SOIL	14-Jul-08	14:45
EV-JS-02-0-1	0812178-17		SOIL	14-Jul-08	14:45
EV-JS-02-5-7	0812178-18		SOIL	14-Jul-08	14:55



225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID) 0812178 Page 1 of 1

Chain-of-Custody Date 12/15/07

Originator: Retain pink copy!

Fax: (505) 424-2012
E-mail: Steven_Vaughn@uscorp.com
Company: Freeport Mc.Moran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 856

~~Standard Dr~~ Rush (Due

Disposer: Date 60 days or Return to Client

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

order no. 0548VT

Tel # 7971 8719 9690

4

Form 202r6.xls (6/16/06)

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type.... HCl, etc.)	No. of Containers	VOCs	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics	TCLP Metals	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Minimum Isotopes 234, 235, 238
CP-35-02-1-3	7/1/08	1320	①	S	n/a	1								SW8260B	SW6010B 7470	SW6010B 7470	SW6010B 7470	SW6010B 7470	SW6020A E200.8	SW7196A Alkaline Digest? Y / N	SW9056 E300.0 (specify in comments)	Total E160.3 TDS E160.1 TSS E160.2	SW9040B SW9045C	SW8015B GRO DRO (circle one or both)	SW9310 E900.0			SW9315 E903.0	E903.1	SW9320 E904.0	D5811-00	E901.1	SM7510Rn	
CP-049-0-1	7/1/08	1452	②	S	n/a	1																												
CP-049-1-3	7/1/08	1452	③	S	n/a	1																												
CP-049-5-7	7/1/08	1458	④	S	n/a	1																												
CP-049-10-12	7/1/08	1502	⑤	S	n/a	1																												
CP-049-15-17	7/1/08	1510	⑥	S	n/a	1																												
CP-35-01-0-1	7/15/08	945	⑦	S	n/a	1																												
CP-35-01-1-3	7/15/08	945	⑧	S	n/a	1																												
CP-35-01-5-7	7/15/08	955	⑨	S	n/a	1																												
CP-P04-0-0-1	7/15/08	1110	⑩	S	n/a	1																												

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: steven_v Vaughn@mscorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 0548VT

Trk # 7971 8719 9690

Relinquished By:	Relinquished By:
Signature Printed Name Date Time Company	Signature Printed Name Date Time Company

Form 202r6.xls (6/16/06)



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812178

Date: 12/16/08 Page 2 of 2

Project Name/No.: FMI-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2843

Fax:

E-mail: steven_v Vaughn@ufccorp.com
Company: Freepoint Mc Meron
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Maximum Isotope
CP-P04-1-3	7/5/08	1121	11	S	n/a	1																												X	
CP-P05-0-1	7/5/08	1315	12	S	n/a	1																												X	
CP-P05-1-3	7/5/08	1333	13	S	n/a	1																												X	
CP-JS-01-10-12	7/5/08	1040	14	S	n/a	1																												X	
EV-JS-01-5-7	7/4/08	1355	15	S	n/a	1																												X	
EV-JS-02-1-3	7/4/08	1445	16	S	n/a	1																												X	
EV-JS-02-0-1	7/4/08	1445	17	S	n/a	1																												X	
EV-JS-02-5-7	7/4/08	1455	18	S	n/a	1																												X	

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments: Order No. 0548VT

Relinquished By: (1) Signature: Kevin Walsh Printed Name: Kevin Walsh Date: 12/16/08 Time: 1600 Company: ALS
Relinquished By: (2) Signature: Cheryl Trimble Printed Name: Cheryl Trimble Date: 12-17-08 Time: 1045 Company: ALS Paragon

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FREEDORTWorkorder No: 0812178Project Manager: JEInitials: CDT Date: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF <input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <input checked="" type="radio"/> #4 <input checked="" type="radio"/> RAD ONLY	YES	<input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>15</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/26/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 16 IN

15.1

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

1 of 4

WED - 17DEC

AA

STANDARD OVERNIGHT

TRK# 7971 8719 9690
 0201

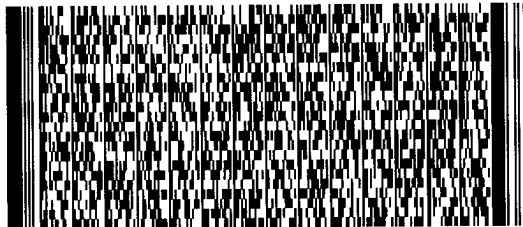
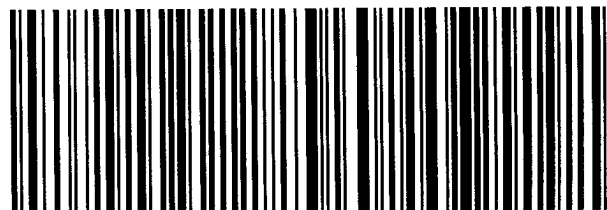
MASTER

80524

CO-US

DEN

XH FTCA



After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090130-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 30-Jan-09

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Final Aliquot: 0.997 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.043 +/- 0.035	0.033	0.1	B3
15117-96-1	U-235	-0.0022 +/- 0.027	0.039	0.1	U
7440-61-1	U-238	0.015 +/- 0.023	0.040	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.535	3.74	pCi/g	82.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090130-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 30-Jan-09

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Final Aliquot: 0.997 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.44 +/- 0.797	0.0718	4.36	102	82 - 122	P
7440-61-1	U-238	4.74 +/- 0.845	0.0508	4.52	105	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.535	3.58	pCi/g	79.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812178-1

Date Printed: Monday, February 16, 2009

ALS Paragon

LIMS Version: 6.245A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-1-3
Lab ID: 0812178-3DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.0 +/- 0.40	2.0 +/- 0.39	0.00	2.13	
15117-96-1	U-235	0.17 +/- 0.075	0.073 +/- 0.048	1.10	2.13	LT
7440-61-1	U-238	2.0 +/- 0.40	2.1 +/- 0.40	0.06	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-1-3
Lab ID: 0812178-16DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.7 +/- 0.51	2.4 +/- 0.45	0.43	2.13	
15117-96-1	U-235	0.21 +/- 0.087	0.14 +/- 0.067	0.56	2.13	
7440-61-1	U-238	2.6 +/- 0.50	2.7 +/- 0.50	0.13	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-02-1-3	Sample Matrix: SOIL	Prep Batch: AS090130-1	Final Aliquot: 1.03 g
Lab ID: 0812178-1	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090130-1-1	Prep Basis: Dry Weight
	Date Collected: 11-Jul-08	Run ID: AS090130-1A	Moisture(%): NA
	Date Prepared: 30-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 04-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.84 +/- 0.19	0.034	0.1	
15117-96-1	U-235	0.081 +/- 0.048	0.033	0.1	LT
7440-61-1	U-238	1.0 +/- 0.22	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.405	3.87	pCi/g	87.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-O09-0-1
Lab ID:	0812178-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.51	0.054	0.1	
15117-96-1	U-235	0.21 +/- 0.086	0.038	0.1	
7440-61-1	U-238	2.8 +/- 0.53	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.57	pCi/g	79.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-O09-1-3
Lab ID:	0812178-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.051	0.1	
15117-96-1	U-235	0.17 +/- 0.075	0.019	0.1	
7440-61-1	U-238	2.0 +/- 0.40	0.057	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.368	3.44	pCi/g	78.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-1-3

Lab ID: 0812178-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.044	0.1	
15117-96-1	U-235	0.073 +/- 0.048	0.047	0.1	LT
7440-61-1	U-238	2.1 +/- 0.40	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.351	3.85	pCi/g	88.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-009-5-7
Lab ID:	0812178-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.066	0.1	
15117-96-1	U-235	0.16 +/- 0.074	0.044	0.1	
7440-61-1	U-238	1.9 +/- 0.37	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.472	3.83	pCi/g	85.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-009-10-12
Lab ID:	0812178-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.37	0.050	0.1	
15117-96-1	U-235	0.10 +/- 0.057	0.019	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.99	pCi/g	89.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-009-15-17
Lab ID:	0812178-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.50	0.058	0.1	
15117-96-1	U-235	0.13 +/- 0.065	0.020	0.1	
7440-61-1	U-238	2.6 +/- 0.49	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.360	3.54	pCi/g	81.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-01-0-1
Lab ID:	0812178-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 15-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.27	0.034	0.1	
15117-96-1	U-235	0.039 +/- 0.039	0.055	0.1	U
7440-61-1	U-238	1.3 +/- 0.28	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	3.56	pCi/g	79.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-01-1-3
Lab ID:	0812178-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 15-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.47	0.073	0.1	
15117-96-1	U-235	0.19 +/- 0.084	0.053	0.1	
7440-61-1	U-238	2.7 +/- 0.52	0.060	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.363	3.26	pCi/g	74.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-01-5-7
Lab ID:	0812178-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 15-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.043	0.1	
15117-96-1	U-235	0.20 +/- 0.079	0.034	0.1	
7440-61-1	U-238	2.1 +/- 0.40	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.331	3.80	pCi/g	87.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P04-0-1
Lab ID:	0812178-10

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 15-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.48	0.016	0.1	
15117-96-1	U-235	0.17 +/- 0.075	0.019	0.1	
7440-61-1	U-238	2.5 +/- 0.47	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.419	3.45	pCi/g	78.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P04-1-3
Lab ID:	0812178-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 15-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.45	0.055	0.1	
15117-96-1	U-235	0.19 +/- 0.084	0.049	0.1	
7440-61-1	U-238	1.9 +/- 0.39	0.062	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.439	3.41	pCi/g	76.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P05-0-1
Lab ID:	0812178-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 15-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.54	0.038	0.1	
15117-96-1	U-235	0.27 +/- 0.10	0.045	0.1	
7440-61-1	U-238	3.0 +/- 0.57	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.344	3.36	pCi/g	77.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P05-1-3
Lab ID:	0812178-13

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 15-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.47	0.045	0.1	
15117-96-1	U-235	0.22 +/- 0.085	0.036	0.1	
7440-61-1	U-238	2.6 +/- 0.48	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.63	pCi/g	80.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-01-10-12
Lab ID:	0812178-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 15-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.52	0.047	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.047	0.1	
7440-61-1	U-238	3.0 +/- 0.55	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.444	3.92	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-01-5-7
Lab ID:	0812178-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.531 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	6.1 +/- 1.1	0.031	0.1	
15117-96-1	U-235	0.40 +/- 0.16	0.036	0.1	
7440-61-1	U-238	6.6 +/- 1.2	0.071	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.516	7.26	pCi/g	85.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-02-1-3
Lab ID:	0812178-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.51	0.047	0.1	
15117-96-1	U-235	0.21 +/- 0.087	0.041	0.1	
7440-61-1	U-238	2.6 +/- 0.50	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.511	3.54	pCi/g	78.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-1-3

Lab ID: 0812178-16DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.45	0.037	0.1	
15117-96-1	U-235	0.14 +/- 0.067	0.019	0.1	
7440-61-1	U-238	2.7 +/- 0.50	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.436	3.91	pCi/g	88.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-02-0-1
Lab ID:	0812178-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.037	0.1	
15117-96-1	U-235	0.15 +/- 0.070	0.044	0.1	
7440-61-1	U-238	2.0 +/- 0.40	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.437	3.73	pCi/g	84.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-02-5-7
Lab ID:	0812178-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 09-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.016	0.1	
15117-96-1	U-235	0.069 +/- 0.047	0.038	0.1	LT
7440-61-1	U-238	2.3 +/- 0.45	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.461	3.57	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

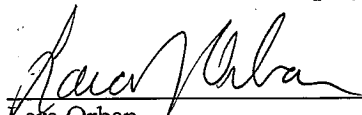
Freeport McMoRan Sierrita

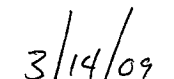
FMI-VRP

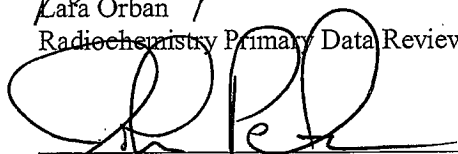
Work Order Number: 0812178

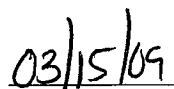
1. This report consists of the analytical results for eleven soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/12/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer


3/14/09
Date


Radiochemistry Final Data Reviewer


03/15/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812178

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-02-1-3	0812178-1		SOIL	11-Jul-08	13:20
CP-P04-0-1	0812178-10		SOIL	15-Jul-08	11:10
CP-P04-1-3	0812178-11		SOIL	15-Jul-08	11:21
CP-P05-0-1	0812178-12		SOIL	15-Jul-08	13:15
CP-P05-1-3	0812178-13		SOIL	15-Jul-08	13:33
CP-JS-01-10-12	0812178-14		SOIL	15-Jul-08	10:40
EV-JS-01-5-7	0812178-15		SOIL	14-Jul-08	13:55
EV-JS-02-1-3	0812178-16		SOIL	14-Jul-08	14:45
EV-JS-02-0-1	0812178-17		SOIL	14-Jul-08	14:45
EV-JS-02-5-7	0812178-18		SOIL	14-Jul-08	14:55
CP-O09-0-1	0812178-2		SOIL	11-Jul-08	14:52
CP-O09-1-3	0812178-3		SOIL	11-Jul-08	14:52
CP-O09-5-7	0812178-4		SOIL	11-Jul-08	14:58
CP-O09-10-12	0812178-5		SOIL	11-Jul-08	15:02
CP-O09-15-17	0812178-6		SOIL	11-Jul-08	15:10
CP-JS-01-0-1	0812178-7		SOIL	15-Jul-08	9:45
CP-JS-01-1-3	0812178-8		SOIL	15-Jul-08	9:45
CP-JS-01-5-7	0812178-9		SOIL	15-Jul-08	9:55



Paragon Analyticals

A Division of DataChem Laboratories, Inc.

225 Commerce Drive Fort Collins, CO 80524

800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID) 0812178

Originator: Retain pink copy!

Chain-of-Custody

Date 12/15/08 Page 1 of 1

Project Name/No.: <u>FM1-VZP</u>	Sampler(s): <u>K. Walsh</u>	Turnaround (circle one) <u>Standard</u> or <u>Rush</u> (Due <u>60 days</u>)	Dispose/Date <u>60 days</u> or Return to Client				
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: E-mail: steven-vaughn@wscorp.com Company: Freeport McMoran Address: 6200 W Duval Mine Rd. Green Valley, AZ 85614							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	Circle method (right); provide additional information as needed (comments).
CP-JS-02-1-3	7/1/08	1320	①	S	n/a	1	
CP-049-0-1	7/1/08	1452	②	S	n/a	1	
CP-049-1-3	7/1/08	1452	③	S	n/a	1	
CP-049-5-7	7/1/08	1458	④	S	n/a	1	
CP-049-10-12	7/1/08	1502	⑤	S	n/a	1	
CP-049-15-17	7/1/08	1510	⑥	S	n/a	1	
CP-JS-01-0-1	7/15/08	945	⑦	S	n/a	1	
CP-JS-01-1-3	7/15/08	945	⑧	S	n/a	1	
CP-JS-01-5-7	7/15/08	955	⑨	S	n/a	1	
CP-P04-0-1	7/15/08	1110	⑩	S	n/a	1	
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments:							
Order No. 0548VT							
Tick # 7971 8719 9690							
3							

SW8260B	SW8021B	SW8270C	SW8081A	SW8082	SW8151A	SW8330	SW8260B 8270C 8081A 8151A	TCLP Metals SW1311 Hg	SW6010B 7470	SW6010B 7470 7471 E200.7	Dissolved Metals by ICP Hg	SW6020A E200.8	Dissolved Metals by ICP/MS	SW6020A E200.8	Hexavalent Chromium SW1796A Alkaline Digest? Y / N	Inorganic Anions SW9056 E300.0 (specify in comments)	Solids: Total E160.3 TDS E160.1 TSS E160.2	PH SW9040B SW9045C	TPH SW8015B GRO DRO (circle one or both)	Gross Alpha / Beta SW9310 E900.0	Actinides by Paragon SOP Pu / U / Am / Th / Cm /	Tritium E906.0	Total Alpha-Emitting Radium SW9315 E903.0	Radium 226 E903.1	Radium 228 SW9320 E904.0	Strontium 90 (Total RadioSr) DS811-00	Gamma Isotopes E901.1	Radon 222 SM7510Rn	Uranium Isotopes 234, 235, 238	

Relinquished By:	Relinquished By:
Signature <u>K. Walsh</u>	Signature <u>Cheryl Trimble</u>
Printed Name <u>Kevin Walsh</u>	Printed Name <u>Cheryl Trimble</u>
Date <u>12/15/08</u>	Date <u>12-17-08</u>
Time <u>1600</u>	Time <u>1045</u>
Company <u>URS</u>	Company <u>ALS Paragon</u>

Received By:	Received By:
Signature <u>Cheryl Trimble</u>	Signature <u>Cheryl Trimble</u>
Printed Name <u>Cheryl Trimble</u>	Printed Name <u>Cheryl Trimble</u>
Date <u>12-17-08</u>	Date <u>12-17-08</u>
Time <u>1045</u>	Time <u>1045</u>
Company <u>ALS Paragon</u>	Company <u>ALS Paragon</u>



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Page 2 of 2

Form 202r6.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FREEDORTWorkorder No: 0812178Project Manager: JEInitials: CDT Date: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF <input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <input checked="" type="radio"/> <u>#4</u> <input checked="" type="radio"/> RAD ONLY	YES	<input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>15</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/26/23

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 16 IN

K5.1

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

1 of 4

WED - 17DEC

AA

TRK# 7971 8719 9690
 0201

STANDARD OVERNIGHT

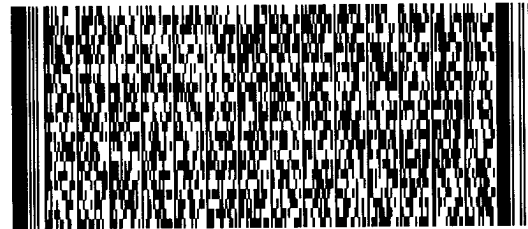
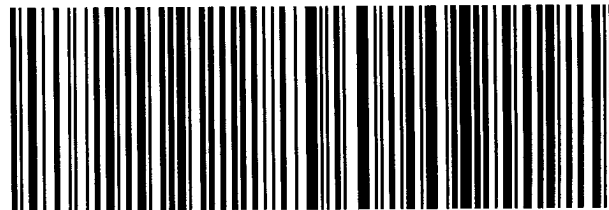
MASTER

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-1MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.14 +/- 0.24	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812178-1

Date Printed: Saturday, March 14, 2009

ALS Paragon
LIMS Version: 6.250A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	48.8 +/- 9.05	0.403	43.3	113	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812178-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-0-1

Lab ID: 0812178-17MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 14-Jul-08

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	28.9	0.43	0.349	42.2	67.5	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812178-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-5-7
Lab ID: 0812178-4DUP

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.7 +/- 0.54	1.5 +/- 0.47	0.25	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
DER - Duplicate Error Ratio (see PAI SOP 715)
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-O09-0-1
Lab ID:	0812178-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.42	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-O09-1-3
Lab ID:	0812178-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.44	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-O09-5-7
Lab ID:	0812178-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.54	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-5-7

Lab ID: 0812178-4DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 11-Jul-08

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.47	0.36	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-O09-10-12	Sample Matrix: SOIL	Prep Batch: RE090220-1	Final Aliquot: 1.10 g
Lab ID: 0812178-5	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-1-1	Prep Basis: Dry Weight
	Date Collected: 11-Jul-08	Run ID: RE090220-1A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.40 +/- 0.30	0.43	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-O09-15-17
Lab ID:	0812178-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.60	0.51	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-01-0-1	Sample Matrix: SOIL	Prep Batch: RE090220-1	Final Aliquot: 1.04 g
Lab ID: 0812178-7	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-1-1	Prep Basis: Dry Weight
	Date Collected: 15-Jul-08	Run ID: RE090220-1A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.64 +/- 0.44	0.59	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-JS-01-1-3
Lab ID:	0812178-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.54	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P04-0-1
Lab ID:	0812178-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.58	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P05-0-1
Lab ID:	0812178-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.38	0.28	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-JS-01-10-12
Lab ID:	0812178-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.71	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812178-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EV-JS-02-0-1
Lab ID:	0812178-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.43 +/- 0.30	0.35	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

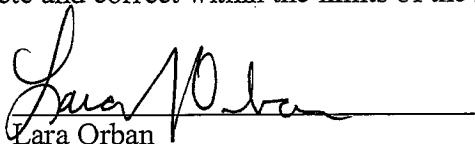
Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812178

1. This report consists of the analytical results for two soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in these samples.
3. The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analyses were completed on 01/29/09.
4. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil samples from this work order were initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. ICP-AES measurement of barium concentrations prior to chemical separation for samples 0812178-2 and -2Dup showed concentrations less than the amount known to have been added to the samples in the form of barium carrier. To avoid a low bias in the final analytical results the known concentration of the carrier was used in chemical yield calculations in lieu of the pre-separation measurement.
7. No further anomalous situations were noted during the preparation and analysis of these samples. All remaining quality control criteria were met.

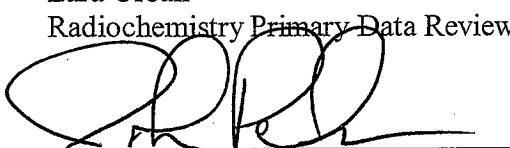


The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban

Radiochemistry Primary Data Reviewer

2/13/09
Date



Radiochemistry Final Data Reviewer

02/16/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812178

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-JS-02-1-3	0812178-1		SOIL	11-Jul-08	13:20
CP-O09-0-1	0812178-2		SOIL	11-Jul-08	14:52
CP-O09-1-3	0812178-3		SOIL	11-Jul-08	14:52
CP-O09-5-7	0812178-4		SOIL	11-Jul-08	14:58
CP-O09-10-12	0812178-5		SOIL	11-Jul-08	15:02
CP-O09-15-17	0812178-6		SOIL	11-Jul-08	15:10
CP-JS-01-0-1	0812178-7		SOIL	15-Jul-08	9:45
CP-JS-01-1-3	0812178-8		SOIL	15-Jul-08	9:45
CP-JS-01-5-7	0812178-9		SOIL	15-Jul-08	9:55
CP-P04-0-1	0812178-10		SOIL	15-Jul-08	11:10
CP-P04-1-3	0812178-11		SOIL	15-Jul-08	11:21
CP-P05-0-1	0812178-12		SOIL	15-Jul-08	13:15
CP-P05-1-3	0812178-13		SOIL	15-Jul-08	13:33
CP-JS-01-10-12	0812178-14		SOIL	15-Jul-08	10:40
EV-JS-01-5-7	0812178-15		SOIL	14-Jul-08	13:55
EV-JS-02-1-3	0812178-16		SOIL	14-Jul-08	14:45
EV-JS-02-0-1	0812178-17		SOIL	14-Jul-08	14:45
EV-JS-02-5-7	0812178-18		SOIL	14-Jul-08	14:55



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Chain-of-Custody

Accession Number (LAB ID) 08121718

Page 7 of 7

Originator: Retain pink copy!

Project Name/No.: En1-V12P Sampler(s): K. Walsh

Report To: Steven Vaughn
Phone: (520) 407-2845

Fax:

E-mail: steven_vauchin@mscorp2.com

Company: Freeport McMoran

Address: 1000 Pearl Street

Green Valley, AZ 85614

Circle method (right): provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers
CP-JS-02-1-3	7/1/08	1320	①	S	n/a	1
CP-049-0-1	7/1/08	1452	②	S	n/a	1
CP-049-1-3	7/1/08	1452	③	S	n/a	1
CP-049-5-7	7/1/08	1458	④	S	n/a	1
CP-049-10-12	7/1/08	1502	⑤	S	n/a	1
CP-049-15-17	7/1/08	1510	⑥	S	n/a	1
CP-JS-01-0-1	7/15/08	945	⑦	S	n/a	1
CP-JS-01-1-3	7/15/08	945	⑧	S	n/a	1
CP-JS-01-5-7	7/15/08	955	⑨	S	n/a	1
CP-P04-0-1	7/15/08	1110	⑩	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

order no. 0548VT

Tel # 7971 8719 9690

4

Form 202r6.xls (6/16/06)

<p>Relinquished By: <u>Karl</u></p> <p>Signature _____</p> <p>Printed Name <u>Kevin Walsh</u></p> <p>Date <u>12/15/08</u> Time <u>1600</u></p> <p>Company <u>URS</u></p>	<p>(1)</p>	<p>Relinquished By: _____</p> <p>Signature _____</p> <p>Printed Name _____</p> <p>Date _____ Time _____</p> <p>Company _____</p>	<p>(2)</p>
<p>Relinquished By: _____</p> <p>Signature _____</p> <p>Printed Name _____</p> <p>Date _____ Time _____</p> <p>Company _____</p>	<p>(1)</p>	<p>Received By: <u>Cheryl Trimble</u></p> <p>Signature _____</p> <p>Printed Name <u>Cheryl Trimble</u></p> <p>Date <u>12-17-08</u> Time <u>1045</u></p> <p>Company <u>ALS Paragon</u></p>	<p>(2)</p>



PARAGON
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ALS Paragon

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812178

Date: 12/16/08 Page 2 of 2

Project Name/No.: FMI-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2843

Fax:

E-mail: steven_v Vaughn@wva.com
Company: Freepert Mc Meron
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers	VOCS		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Maximum Isotope
CP-P04-1-3	7/5/08	1121	11	S	n/a	1																													X
CP-P05-0-1	7/5/08	1315	12	S	n/a	1																													X
CP-P05-1-3	7/5/08	1333	13	S	n/a	1																													X
CP-JS-01-10-12	7/5/08	1040	14	S	n/a	1																													X
EV-JS-01-5-7	7/4/08	1355	15	S	n/a	1																													X
EV-JS-02-1-3	7/4/08	1445	16	S	n/a	1																													X
EV-JS-02-0-1	7/4/08	1445	17	S	n/a	1																													X
EV-JS-02-5-7	7/4/08	1455	18	S	n/a	1																													X

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments: Order No. 0548VT

Relinquished By: (1) Signature: Kevin Walsh Printed Name: Kevin Walsh Date: 12/16/08 Time: 1600 Company: ALS
Relinquished By: (2) Signature: Cheryl Trimble Printed Name: Cheryl Trimble Date: 12-17-08 Time: 1045 Company: ALS Paragon
Form 202-6.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FREEDORTWorkorder No: 0812178Project Manager: JEInitials: CDT Date: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF <input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <input checked="" type="radio"/> <u>#4</u> <input checked="" type="radio"/> RAD ONLY	YES	<input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>15</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
Rick Smith
URS Corporation
333 E. Wetmore Rd
Suite 400
Tucson, AZ 85705



JCL5111288/26/23

Ship Date: 16DEC08
ActWgt: 12.5 LB
CAD: 9880693/INET8091
Account#: S *****

Dims: 22 X 17 X 15 IN

K5.1

Delivery Address Bar Code



Ref # 24096838.54210.10013
Invoice #
PO #
Dept #

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

1 of 4

WED - 17DEC AA

STANDARD OVERNIGHT

TRK# 7971 8719 9690
0201

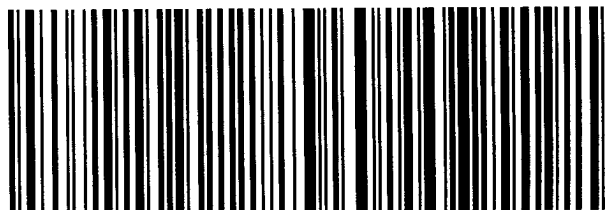
MASTER

80524

CO-US

DEN

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**After printing this label:**

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3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812178-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812178-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-0-1
Lab ID: 0812178-2DUP

Sample Matrix: SOIL
Prep SOP: PAI 746 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 20-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2
QCBatchID: RA090120-2-1
Run ID: RA090120-2A
Count Time: 250 minutes
Report Basis: Dry Weight

Final Aliquot: 0.502 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: RAA0129

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	7.6 +/- 2.9	3.3 +/- 1.8	1.25	2.13	LT

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
DER - Duplicate Error Ratio (see PAI SOP 715)
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: RA0812178-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-O09-0-1
Lab ID:	0812178-2

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 11-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.505 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	7.6 +/- 2.9	3.4	5	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	31600	ug	89.8	40 - 110 %	
YTTRIUM	8713	4790	ug	55.0	40 - 110 %	
Total				49.4	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812178-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-0-1

Lab ID: 0812178-2DUP

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 11-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.502 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.3 +/- 1.8	2.9	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	32600	ug	92.5	40 - 110 %	
YTTRIUM	8713	4940	ug	56.7	40 - 110 %	
Total				52.5	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812178-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-01-0-1
Lab ID:	0812178-7

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 15-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.507 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.2 +/- 1.9	2.7	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36280	31800	ug	87.6	40 - 110 %	
YTTRIUM	8713	5070	ug	58.2	40 - 110 %	
Total				51.0	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812178-1



March 16, 2009

Mr. Aaron Hilshorst
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-207
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Hilshorst:

Nineteen soil samples were received from Freeport McMoRan Sierrita on December 17, 2008.
The samples were scheduled for the following analyses.

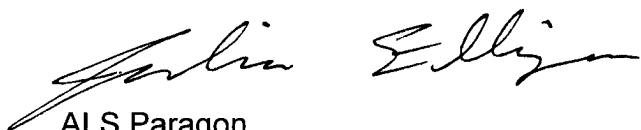
Isotopic Uranium pages 1-25
Gamma Spectroscopy pages 1-54

Radium-228 by Method 9320 pages 1-9
Radium-226 by EPA Method 903.1 (m) pages 1-18

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/mh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812207

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RA-JS-04-0-1	0812207-1		SOIL	07-Aug-08	8:40
RA-JS-04-1-2.5	0812207-2		SOIL	07-Aug-08	8:40
RA-JS-03-1-3	0812207-3		SOIL	07-Aug-08	8:17
RA-JS-05-1-3	0812207-4		SOIL	07-Aug-08	9:46
EM-P24-0-1	0812207-5		SOIL	07-Aug-08	10:30
EM-P24-5-7	0812207-6		SOIL	07-Aug-08	10:45
RA-JS-01-0-1	0812207-7		SOIL	07-Aug-08	12:39
RA-JS-01-5-7	0812207-8		SOIL	07-Aug-08	12:42
RA-SD-02-0-1.5	0812207-9		SOIL	11-Aug-08	9:10
RA-SD-02-1.5-3.0	0812207-11		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5	0812207-12		SOIL	11-Aug-08	9:50
RA-JS-02-0-1.0	0812207-14		SOIL	11-Aug-08	10:25
RA-JS-02-1-3	0812207-17		SOIL	11-Aug-08	10:45
RA-JS-01-1.5-3.0	0812207-19		SOIL	11-Aug-08	10:05



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812207

Date: 12-19-08 Page 1 of 2

Project Name/No.: FKI-VIRP		Sampler(s): K. Walsh		Turnaround (circle one): Standard or Rush (Due _____)		Dispose? Date 60 day or Return to Client _____																																																								
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: _____ E-mail: steven_v Vaughn@wscorp.com Company: Freepert Mc Moran Address: 6200 W David Mine Rd. Green Valley, AZ 85614																																																														
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	Circle method (right); provide additional information as needed (comments).																																																							
RA-JS-04-0-1	8/7/08	840	1	S	N/A	1	VOCs	SW6260B	BTX (only)	SW6021B	SVOCs	SW6270C	OC Pesticides	SW6081A	PCBs	SW6082	Herbicides	SW6151A	Explosives	SW6330	TCLP Organics SW1311	SW6260B 8270C 8081A 8151A	TCLP Metals SW1311 Hg	SW6010B 7470	Total Metals by ICP Hg	SW6010B 7470 7471 E200.7	Dissolved Metals by ICP Hg	SW6010B 7470 E200.7	Total Metals by ICP/MS	SW6020A E200.8	Dissolved Metals by ICP/MS	SW6020A E200.8	Hexavalent Chromium	SW1796A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	Total E160.3 TDS E160.1 TSS E160.2	pH	SW9040B SW9045C	TPH	SW6015B GRO DRO (circle one or both)	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm / _____	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Uranium Isotopes 234, 235, 238	
Reinforced By: (1) Signature: Ken Walsh Printed Name: Ken Walsh Date: 12-19-08 Time: 1600 Company: ALS Paragon																																																														
Reinforced By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____																																																														
Reinforced By: (1) Signature: _____ Printed Name: _____ Date: 12-20-08 Time: 1600 Company: ALS Paragon																																																														
Reinforced By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____																																																														



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ANALYTICALS

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812207

Date: 12-19-08 Page 2 of 2

Project Name/No.: FMI-VIRP		Sampler(s): K Walsh		Turnaround (circle one): Standard or Rush (Due _____)		Dispose: Date 60 day or Return to Client _____	
Report To: Steven Vaughn		Phone: (520) 407-2845		Fax:			
E-mail: steven_v Vaughn@wscorp.com		Company: Freepoint Mc Moran		Address: 6200 W Duval Ave Rd		Green Valley, AZ 85614	
Circle method (right); provide additional information as needed (comments).	Sample ID	Date	Time	Lab ID	Matrix	Preservative	No. of Containers
	RA-SD-02-1-5-3-0	8/1/08	930	11	S	W/A	1
	RA-SD-01-0-1-5	8/1/08	950	12	S	W/A	1
	RA-SD-01-0-1-5 MSD	8/1/08	950	13	S	W/A	1
	RA-JS-02-0-1-0	8/1/08	1025	14	S	W/A	1
	RA-JS-02-0-1-0 MS	8/1/08	1025	15	S	W/A	1
	RA-JS-02-0-1-0 MS	8/1/08	1025	16	S	W/A	1
	RA-JS-02-1-3 MS	8/1/08	1045	17	S	W/A	1
	RA-JS-02-1-3 MS	8/1/08	1045	18	S	W/A	1
	RA-SD-01-1-5-3-0	8/1/08	1005	19	S	W/A	1
	RA-SD-01-1-5-3-0 MS	8/1/08	1005	20	S	W/A	1
	RA-SD-01-1-5-3-0	8/1/08	1005	21	S	W/A	1
Comments: * Time Zone: EST CST MST PST Matrix Key: 0 = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter Order No. 0548VT Pick # 797193613916							
Relinquished By: (1)				Relinquished By: (2)			
Signature: <u>Kevin Walsh</u>				Signature: _____			
Printed Name: <u>Kevin Walsh</u>				Printed Name: _____			
Date: <u>12-19-08</u>				Date: _____			
Time: <u>1600</u>				Time: _____			
Company: <u>URS</u>				Company: _____			
Received By: (1)				Received By: (2)			
Signature: <u>Lara Jorban</u>				Signature: _____			
Printed Name: <u>Lara Jorban</u>				Printed Name: _____			
Date: <u>12/20/08</u>				Date: _____			
Time: <u>1000</u>				Time: _____			
Company: <u>ALS Paragon</u>				Company: _____			

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmcWorkorder No: 0812207
Initials: LTO Date: 12/26/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u> NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #4 (RA-JS-05-1-3) Sample time on ID label 0947.
 #11 (RA-SD-02-1.5-3.0) Sample ID on label RA-SD-02-1.5-3.0MS.
 • One 16 oz WMG jar received for all samples. Filled 20% - 100%.
 + Sample #1 (RA-JS-04-0-1) was received with a broken lid. Lid replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111288/28/23

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/NET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812207

5 of 5

MON - 22DEC

AA

MPS# 7971 9861 3916
 0263

STANDARD OVERNIGHT

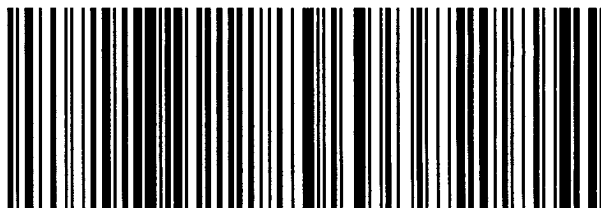
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

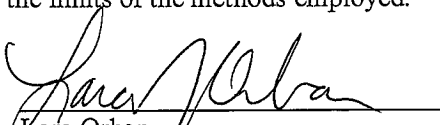
Freeport McMoRan Sierrita

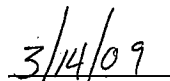
FMI-VRP

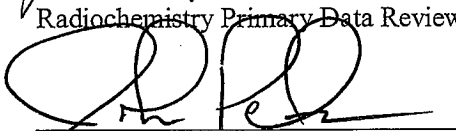
Work Order Number: 0812207

1. This report consists of the analytical results for six soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/12/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer


3/14/09
Date


Radiochemistry Final Data Reviewer


03/15/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812207

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RA-JS-04-0-1	0812207-1		SOIL	07-Aug-08	8:40
RA-SD-02-1.5-3.0	0812207-11		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5	0812207-12		SOIL	11-Aug-08	9:50
RA-JS-02-0-1.0	0812207-14		SOIL	11-Aug-08	10:25
RA-JS-02-1-3	0812207-17		SOIL	11-Aug-08	10:45
RA-JS-01-1.5-3.0	0812207-19		SOIL	11-Aug-08	10:05
RA-JS-04-1-2.5	0812207-2		SOIL	07-Aug-08	8:40
RA-JS-03-1-3	0812207-3		SOIL	07-Aug-08	8:17
RA-JS-05-1-3	0812207-4		SOIL	07-Aug-08	9:46
EM-P24-0-1	0812207-5		SOIL	07-Aug-08	10:30
EM-P24-5-7	0812207-6		SOIL	07-Aug-08	10:45
RA-JS-01-0-1	0812207-7		SOIL	07-Aug-08	12:39
RA-JS-01-5-7	0812207-8		SOIL	07-Aug-08	12:42
RA-SD-02-0-1.5	0812207-9		SOIL	11-Aug-08	9:10



ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812207

Date: 12-19-08

Page 2 of 2

Project Name/No:	Form - VRT	Sampler(s):	Turnaround (circle one):	Standard	Rush (Due)	Dispose:	Date	60 day	or Return to Client
Report To: Steven Vaughn Phone: (520) 407-2895 Fax: E-mail: steven.v Vaughn@ussteelcorp.com Company: Freeport McMoran Address: 6200 W Duvall Mine Rd Green Valley, AZ 85614									
Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers	Circle method (right); provide additional information as needed (comments).		
RA-SD-02-1-5-3-0	8/1/08	930	11	S	N/A	1			
RA-SD-01-0-1-5	8/1/08	950	12	S	N/A	1			
RA-SD-01-0-1-5 MSD	8/1/08	950	13	S	N/A	1			
RA-JS-02-0-1-0	8/1/08	1025	14	S	N/A	1			
RA-JS-02-0-1-0 MSD	8/1/08	1025	15	S	N/A	1			
RA-JS-02-0-1-0 MSD	8/1/08	1025	16	S	N/A	1			
RA-JS-02-1-3 MS	8/1/08	1045	17	S	N/A	1			
RA-JS-02-1-3 MSD	8/1/08	1045	18	S	N/A	1			
RA-SD-01-1-5-3-0	8/1/08	1005	19	S	N/A	1			
RA-SD-01-1-5-3-0 MSD	8/1/08	1005	20	S	N/A	1			
Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							Relinquished By: (1) Signature: <u>Kevin Walsh</u> Printed Name: <u>Kevin Walsh</u> Date: <u>12-19-08</u> Time: <u>1600</u> Company: <u>URS</u>		
Comments:							Relinquished By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____		
Order No. 054807							Received By: (1) Signature: <u>Lara Urban</u> Printed Name: <u>Lara Urban</u> Date: <u>12/20/08</u> Time: <u>1000</u> Company: <u>ALS Paragon</u>		
Trk # 797198613916							Received By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____		

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812207
Initials: WJO Date: 12/26/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES
17. Were the samples shipped on ice?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #4 (RA-JS-05-1-3) Sample time on ID label 0947.
 #11 (RA-SD-02-1.5-3.0) Sample ID on label RA-SD-02-1.5-3.0MS.
 * One 16 oz WMG jar received for all samples. Filled 20% - 100%.
 + Sample #1 (RA-JS-04-0-1) was received with a broken lid. Lid replaced.

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705

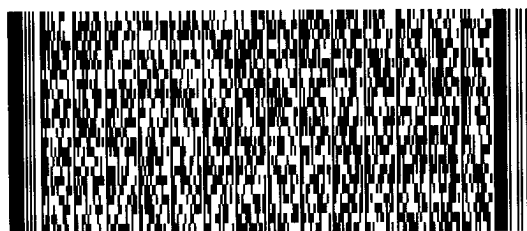


JCL5111268/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812207

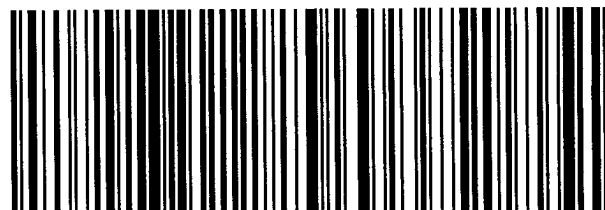
5 of 5

MON - 22DEC AA

MPS# 7971 9861 3916
 0263

STANDARD OVERNIGHT

Mstr# 7971 9861 3710 0201

80524**CO-US****DEN****XH FTCA****After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-1MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.14 +/- 0.24	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812207-1

Date Printed: Saturday, March 14, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-2MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.17 +/- 0.30	0.61	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812207-1

Date Printed: Saturday, March 14, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	48.8 +/- 9.05	0.403	43.3	113	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812207-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	35.5 +/- 6.63	0.547	43.2	82.2	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812207-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-05-1-3

Lab ID: 0812207-4DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 07-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	3.8 +/- 0.95	3.1 +/- 0.82	0.59	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812207-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-04-1-2.5	Sample Matrix: SOIL	Prep Batch: RE090220-1	Final Aliquot: 1.02 g
Lab ID: 0812207-2	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-1-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: RE090220-1A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.80	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-03-1-3	Sample Matrix: SOIL	Prep Batch: RE090220-1	Final Aliquot: 1.06 g
Lab ID: 0812207-3	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-1-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: RE090220-1A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.84 +/- 0.36	0.43	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RA-JS-05-1-3
Lab ID:	0812207-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.8 +/- 0.95	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812207-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-05-1-3
Lab ID:	0812207-4DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 07-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.1 +/- 0.82	0.30	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812207-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-P24-5-7
Lab ID:	0812207-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.73	0.23	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-0-1
Lab ID:	0812207-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.61	0.66	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812207-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-5-7
Lab ID:	0812207-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.90 +/- 0.39	0.24	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

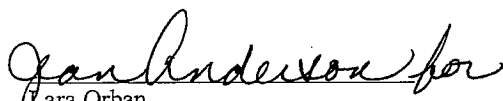
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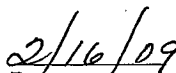
FMI-VRP

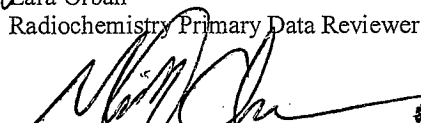
Work Order Number: 0812207

1. This report consists of the analytical results for one soil sample received by ALS Paragon on 12/20/08.
2. This sample was prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in these samples.
3. The sample was analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analysis was completed on 01/29/09.
4. The analysis results for this sample are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil sample from this work order was initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. No further anomalous situations were noted during the preparation and analysis of this sample. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer


Date 02/16/09


Radiochemistry Final Data Reviewer

FOR
JOHN


Date 02/16/09

PETROSIC

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812207

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RA-JS-04-0-1	0812207-1		SOIL	07-Aug-08	8:40
RA-JS-04-1-2.5	0812207-2		SOIL	07-Aug-08	8:40
RA-JS-03-1-3	0812207-3		SOIL	07-Aug-08	8:17
RA-JS-05-1-3	0812207-4		SOIL	07-Aug-08	9:46
EM-P24-0-1	0812207-5		SOIL	07-Aug-08	10:30
EM-P24-5-7	0812207-6		SOIL	07-Aug-08	10:45
RA-JS-01-0-1	0812207-7		SOIL	07-Aug-08	12:39
RA-JS-01-5-7	0812207-8		SOIL	07-Aug-08	12:42
RA-SD-02-0-1.5	0812207-9		SOIL	11-Aug-08	9:10
RA-SD-02-1.5-3.0	0812207-11		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5	0812207-12		SOIL	11-Aug-08	9:50
RA-JS-02-0-1.0	0812207-14		SOIL	11-Aug-08	10:25
RA-JS-02-1-3	0812207-17		SOIL	11-Aug-08	10:45
RA-JS-01-1.5-3.0	0812207-19		SOIL	11-Aug-08	10:05



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812207

Date: 12-19-08

Page 2 of 2

Project Name/No:	Form - VRT	Sampler(s):	Turnaround (circle one):	Standard	Rush (Due)	Dispose:	Date	60 day	or Return to Client
Report To: Steven Vaughn Phone: (520) 407-2895 Fax: E-mail: steven.v Vaughn@ussteelcorp.com Company: Freeport McMoran Address: 6200 W Duvall Mine Rd Green Valley, AZ 85614									
Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers	Circle method (right); provide additional information as needed (comments).		
RA-SD-02-1-5-3-0	8/1/08	930	11	S	N/A	1			
RA-SD-01-0-1-5	8/1/08	950	12	S	N/A	1			
RA-SD-01-0-1-5 MSD	8/1/08	950	13	S	N/A	1			
RA-JS-02-0-1-0	8/1/08	1025	14	S	N/A	1			
RA-JS-02-0-1-0 MSD	8/1/08	1025	15	S	N/A	1			
RA-JS-02-0-1-0 MSD	8/1/08	1025	16	S	N/A	1			
RA-JS-02-1-3 MS	8/1/08	1045	17	S	N/A	1			
RA-JS-02-1-3 MSD	8/1/08	1045	18	S	N/A	1			
RA-SD-01-1-5-3-0	8/1/08	1005	19	S	N/A	1			
RA-SD-01-1-5-3-0 MSD	8/1/08	1005	20	S	N/A	1			
Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							Relinquished By: (1)		
Comments:							Relinquished By: (2)		
Signature: <u>Kevin Walsh</u>							Signature: _____		
Printed Name: <u>Kevin Walsh</u>							Printed Name: _____		
Date: <u>12-19-08</u> Time: <u>1600</u>							Date: _____ Time: _____		
Company: <u>URS</u>							Company: _____		
Received By: <u>Lara Urban</u>							Received By: (1)		
Signature: <u>Lara Urban</u>							Signature: _____		
Printed Name: <u>Lara Urban</u>							Printed Name: _____		
Date: <u>12/20/08</u> Time: <u>1600</u>							Date: _____ Time: _____		
Company: <u>ALS Paragon</u>							Company: _____		

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812207
Initials: WJO Date: 12/26/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES
17. Were the samples shipped on ice?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #4 (RA-JS-05-1-3) Sample time on ID label 0947.
 #11 (RA-SD-02-1.5-3.0) Sample ID on label RA-SD-02-1.5-3.0MS.
 * One 16 oz WMG jar received for all samples. Filled 20% - 100%.
 + Sample #1 (RA-JS-04-0-1) was received with a broken lid. Lid replaced.

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705

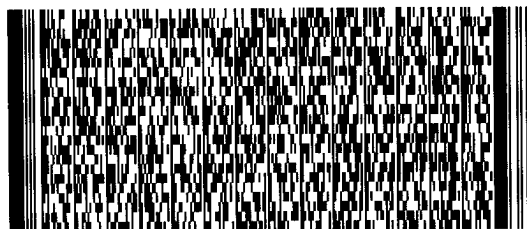


JCL5111268/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812207

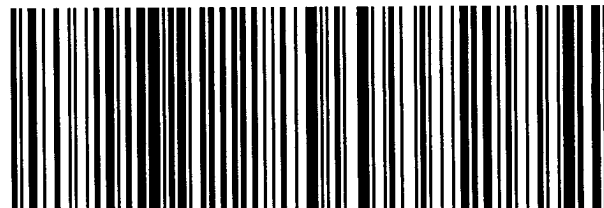
5 of 5

MON - 22DEC AA

MPS# 7971 9861 3916
 0263

STANDARD OVERNIGHT

Mstr# 7971 9861 3710 0201

80524**CO-US****DEN****XH FTCA****After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812207-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812207-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-0-1
Lab ID:	0812207-7

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 07-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.505 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 1.5	2.7	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36680	32600	ug	88.9	40 - 110 %	
YTTRIUM	8713	5460	ug	62.7	40 - 110 %	
Total				55.8	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812207-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812207

1. This report consists of the analytical results for 14 soil samples received by ALS Paragon on 12/20/2008.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to possible matrix interference, these samples were prepared at a reduced aliquot of ~1 gram.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 02/21/2009.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. Uranium-235 activity is reported in the associated method blank above the minimum detectable concentration value. The measured blank activity is below the requested MDC of 0.1 pCi/gram. Results are acceptable according to SOP715R15, and are submitted without further qualification.
7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jan Anderson
Jan Anderson
Radiochemistry Primary Data Reviewer

2/25/09
Date

Rebecca Kelly
Rebecca Kelly
Radiochemistry Final Data Reviewer

2/26/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812207

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RA-JS-04-0-1	0812207-1		SOIL	07-Aug-08	8:40
RA-JS-04-1-2.5	0812207-2		SOIL	07-Aug-08	8:40
RA-JS-03-1-3	0812207-3		SOIL	07-Aug-08	8:17
RA-JS-05-1-3	0812207-4		SOIL	07-Aug-08	9:46
EM-P24-0-1	0812207-5		SOIL	07-Aug-08	10:30
EM-P24-5-7	0812207-6		SOIL	07-Aug-08	10:45
RA-JS-01-0-1	0812207-7		SOIL	07-Aug-08	12:39
RA-JS-01-5-7	0812207-8		SOIL	07-Aug-08	12:42
RA-SD-02-0-1.5	0812207-9		SOIL	11-Aug-08	9:10
RA-SD-02-1.5-3.0	0812207-11		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5	0812207-12		SOIL	11-Aug-08	9:50
RA-JS-02-0-1.0	0812207-14		SOIL	11-Aug-08	10:25
RA-JS-02-1-3	0812207-17		SOIL	11-Aug-08	10:45
RA-JS-01-1.5-3.0	0812207-19		SOIL	11-Aug-08	10:05

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812207
Initials: LJO Date: 12/26/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u>
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u>
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u>	YES
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u>	YES
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES
17. Were the samples shipped on ice?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<u>RAD ONLY</u>	YES
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #4 (RA-JS-05-1-3) Sample time on ID label 0947.
 #11 (RA-SD-02-1.5-3.0) Sample ID on label RA-SD-02-1.5-3.0MS.
 * One 16 oz WMG jar received for all samples. Filled 20% - 100%.
 + Sample #1 (RA-JS-04-0-1) was received with a broken lid. Lid replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705

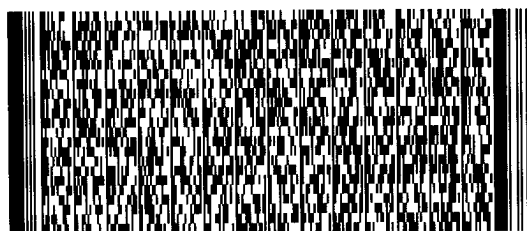


JCL5111268/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812207

5 of 5

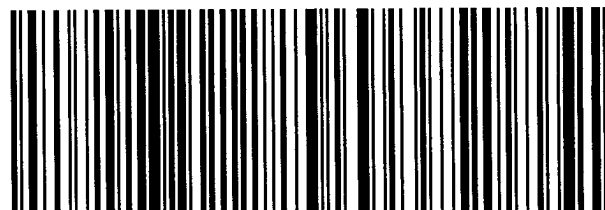
MON - 22DEC AA

MPS# 7971 9861 3916

0263

STANDARD OVERNIGHT

Mstr# 7971 9861 3710 0201

80524**CO-US****DEN****XH FTCA****After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090217-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Feb-09

Date Prepared: 17-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Final Aliquot: 1.00 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.019 +/- 0.025	0.043	0.1	U
15117-96-1	U-235	0.021 +/- 0.026	0.019	0.1	B3
7440-61-1	U-238	0.0042 +/- 0.022	0.032	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.495	3.74	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090217-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Feb-09

Date Prepared: 17-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Final Aliquot: 1.00 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.23 +/- 0.757	0.0415	4.32	97.9	82 - 122	P
7440-61-1	U-238	4.36 +/- 0.778	0.0306	4.48	97.2	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.495	3.74	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812207-1

Date Printed: Wednesday, February 25, 2009

ALS Paragon

LIMS Version: 6.247A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-03-1-3
Lab ID: 0812207-3DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.8 +/- 0.35	1.8 +/- 0.36	0.04	2.13	
15117-96-1	U-235	0.10 +/- 0.056	0.095 +/- 0.054	0.11	2.13	LT
7440-61-1	U-238	1.9 +/- 0.38	1.8 +/- 0.36	0.22	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-04-0-1
Lab ID:	0812207-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.30	0.041	0.1	
15117-96-1	U-235	0.079 +/- 0.049	0.036	0.1	LT
7440-61-1	U-238	1.6 +/- 0.32	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.509	3.80	pCi/g	84.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-04-1-2.5
Lab ID:	0812207-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.039	0.1	
15117-96-1	U-235	0.083 +/- 0.049	0.034	0.1	LT
7440-61-1	U-238	2.0 +/- 0.39	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.483	3.85	pCi/g	85.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-03-1-3	Sample Matrix: SOIL	Prep Batch: AS090217-1	Final Aliquot: 1.01 g
Lab ID: 0812207-3	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090217-1-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: AS090217-1A	Moisture(%): NA
	Date Prepared: 17-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 20-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.035	0.1	
15117-96-1	U-235	0.10 +/- 0.056	0.035	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.77	pCi/g	84.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-03-1-3

Lab ID: 0812207-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.031	0.1	
15117-96-1	U-235	0.095 +/- 0.054	0.036	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.514	3.70	pCi/g	82.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-05-1-3
Lab ID:	0812207-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.7 +/- 0.66	0.027	0.1	
15117-96-1	U-235	0.12 +/- 0.056	0.017	0.1	
7440-61-1	U-238	3.5 +/- 0.62	0.027	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.478	4.02	pCi/g	89.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-0-1	Sample Matrix: SOIL	Prep Batch: AS090217-1	Final Aliquot: 1.00 g
Lab ID: 0812207-5	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090217-1-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: AS090217-1A	Moisture(%): NA
	Date Prepared: 17-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 20-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.43	0.030	0.1	
15117-96-1	U-235	0.078 +/- 0.048	0.035	0.1	LT
7440-61-1	U-238	2.1 +/- 0.41	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	3.83	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-P24-5-7
Lab ID:	0812207-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.042	0.1	
15117-96-1	U-235	0.12 +/- 0.059	0.040	0.1	
7440-61-1	U-238	2.2 +/- 0.42	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.485	3.93	pCi/g	87.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-0-1
Lab ID:	0812207-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.044	0.1	
15117-96-1	U-235	0.087 +/- 0.052	0.047	0.1	LT
7440-61-1	U-238	1.6 +/- 0.32	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	3.90	pCi/g	86.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-5-7
Lab ID:	0812207-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.3 +/- 0.59	0.059	0.1	
15117-96-1	U-235	0.16 +/- 0.071	0.050	0.1	
7440-61-1	U-238	3.4 +/- 0.61	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.490	4.02	pCi/g	89.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-0-1.5
Lab ID:	0812207-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.22	0.043	0.1	
15117-96-1	U-235	0.052 +/- 0.038	0.018	0.1	LT
7440-61-1	U-238	0.92 +/- 0.21	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.493	4.20	pCi/g	93.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-1.5-3.0
Lab ID:	0812207-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.28	0.058	0.1	
15117-96-1	U-235	0.060 +/- 0.043	0.036	0.1	LT
7440-61-1	U-238	1.2 +/- 0.25	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	3.84	pCi/g	85.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5	Sample Matrix: SOIL	Prep Batch: AS090217-1	Final Aliquot: 1.00 g
Lab ID: 0812207-12	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090217-1-1	Prep Basis: Dry Weight
	Date Collected: 11-Aug-08	Run ID: AS090217-1A	Moisture(%): NA
	Date Prepared: 17-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 20-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.44	0.047	0.1	
15117-96-1	U-235	0.091 +/- 0.052	0.035	0.1	LT
7440-61-1	U-238	2.3 +/- 0.44	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.515	4.24	pCi/g	93.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-0-1.0
Lab ID:	0812207-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.051	0.1	
15117-96-1	U-235	0.082 +/- 0.053	0.047	0.1	LT
7440-61-1	U-238	2.1 +/- 0.43	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	3.49	pCi/g	77.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-1-3
Lab ID:	0812207-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	5.3 +/- 0.96	0.054	0.1	
15117-96-1	U-235	0.17 +/- 0.082	0.051	0.1	
7440-61-1	U-238	5.2 +/- 0.93	0.019	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.502	3.28	pCi/g	72.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-1.5-3.0
Lab ID:	0812207-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.2 +/- 0.75	0.050	0.1	
15117-96-1	U-235	0.20 +/- 0.083	0.037	0.1	
7440-61-1	U-238	3.9 +/- 0.71	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.505	3.92	pCi/g	86.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita FMI-VRP

Work Order Number: 0812207

1. The following report consists of analytical results and supporting documentation for 13 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812207-1, -9, -11, -12, -14, -17, and -19 were sealed in steel cans on 12/30/08 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. Sample 0812207-5 was sealed in a steel can on 01/02/09 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/20/09 and 01/23/09, respectively, is at least 97.78%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.89%.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/26/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volume was insufficient to allow preparation of a duplicate in batch GS090109-6. A duplicate analysis of sample 0812207-5 was performed in lieu of a prepared duplicate.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples. This is applicable for samples 0812207-1, -5, -9, -11, -12, -14, -17, and -19.
7. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium. This is applicable for samples 0812207-1, -5, -9, -11, -12, -14, -17, and -19.

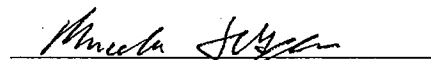


8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. The requested detection limit of 1.0 pCi/gram for ^{228}Ra was not met for samples 0812207-3, -4, -8, -9, -9DUP, -11, -14, -17, and -19. The reported activities are greater than the achieved detection limits. The results have been flagged with a "M3" qualifier on the final reports. The results are submitted without further qualification.
11. There are cases where the magnitude of negative activity is greater than the 2σ TPU. Under typical conditions, where background data is normally distributed and analyzed by paired observations, this event is likely to occur at least 2.5% of the time. Review of the data does not indicate a problem with the instrument or reporting systems and results are reported without further qualification.
12. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer

02/16/09
Date


Radiochemistry Final Data Reviewer

2-16-09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812207

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RA-JS-04-0-1	0812207-1		SOIL	07-Aug-08	8:40
RA-JS-04-1-2.5	0812207-2		SOIL	07-Aug-08	8:40
RA-JS-03-1-3	0812207-3		SOIL	07-Aug-08	8:17
RA-JS-05-1-3	0812207-4		SOIL	07-Aug-08	9:46
EM-P24-0-1	0812207-5		SOIL	07-Aug-08	10:30
EM-P24-5-7	0812207-6		SOIL	07-Aug-08	10:45
RA-JS-01-0-1	0812207-7		SOIL	07-Aug-08	12:39
RA-JS-01-5-7	0812207-8		SOIL	07-Aug-08	12:42
RA-SD-02-0-1.5	0812207-9		SOIL	11-Aug-08	9:10
RA-SD-02-1.5-3.0	0812207-11		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5	0812207-12		SOIL	11-Aug-08	9:50
RA-JS-02-0-1.0	0812207-14		SOIL	11-Aug-08	10:25
RA-JS-02-1-3	0812207-17		SOIL	11-Aug-08	10:45
RA-JS-01-1.5-3.0	0812207-19		SOIL	11-Aug-08	10:05



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ALS Paragon

ALS Laboratory Group



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID 0812207

Date: 12-19-08 Page 1 of 2

Project Name/No.: FBI-VI2P Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due 60 day) Dispose? Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: steven_v Vaughn@wscorp.com
Company: Freepert Mc Moran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers
RA-JS-04-0-1	8/7/08	840	1	S	n/a	1
RA-JS-04-1-2-5	8/7/08	840	2	S	n/a	1
RA-JS-03-1-3	8/7/08	817	3	S	n/a	1
RA-JS-05-1-3	8/7/08	946	4	S	n/a	1
EM-P24-0-1	8/7/08	1030	5	S	n/a	1
EM-P24-5-7	8/7/08	1045	6	S	n/a	1
RA-JS-01-0-1	8/7/08	1239	7	S	n/a	1
RA-JS-01-5-7	8/7/08	1242	8	S	n/a	1
RA-SD-02-0-1-5	8/1/08	910	9	S	n/a	1
RA-SD-02-0-1-5ms	8/1/08	910	10	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 050807

Trk # 79719813416

Report To: Steven Vaughn Phone: (520) 407 - 2845 Fax: E-mail: steven_v Vaughn@wscorp.com Company: Freepart Mc Moran Address: 6200 W David Mine Rd. Green Valley, AZ 85614										Circle method (right); provide additional information as needed (comments).																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Sample ID	Date	Time	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers	VOCs	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	SWB315 E903.0	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Maximum Isotopes 234, 235, 238																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
RA-JS-04-0-1	8/7/08	840	1	S	n/a	1								SWB260B 8270C 8081A 8151A	SWB010B 7470	SWB010B 7470 7471 E200.7	SWB010B 7470 E200.7	SWB020A E200.8	SWB020A E200.8	SW7196A Alkaline Digest? Y / N	SW9056 E300.0 (specify in comments)	Total E160.3 TDS E160.1 TSS E160.2	SW9040B SW9045C	SWB015B GRO DRO (circle one or both)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</

Relinquished By:	Relinquished By:
Signature <u>Ken Walsh</u>	Signature <u>Lara J. Orban</u>
Printed Name <u>Ken Walsh</u>	Printed Name <u>Lara J. Orban</u>
Date <u>12-19-08</u>	Date <u>12/20/08</u>
Time <u>1600</u>	Time <u>1600</u>
Company <u>ALS</u>	Company <u>ALS Paragon</u>



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ALS Paragon

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ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID **0812207**

Date: **12-19-08** Page **2** of **2**

Project Name/No.: FMA-VIRP Sampler(s): K.Walsh		Turnaround (circle one): Standard or Rush (Due _____)		Dispose: Date 60 day or Return to Client _____	
Report To: Steven Vaughn Phone: (520) 407-2895 Fax: _____ E-mail: steven.v Vaughn@ussteelcorp.com Company: Freeport McMoran Address: 6200 W Duvall Mine Rd Green Valley, AZ 85614					
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)
RA-SD-02-1-5-3-0	8/1/08	930	11	S	n/a
RA-SD-01-0-1-5	8/1/08	950	12	S	n/a
RA-SD-01-0-1-5 MSD	8/1/08	950	13	S	n/a
RA-JS-02-0-1-0	8/1/08	1025	14	S	n/a
RA-JS-02-0-1-0 MSD	8/1/08	1025	15	S	n/a
RA-JS-02-0-1-0 MSD	8/1/08	1025	16	S	n/a
RA-JS-02-1-3 MSD	8/1/08	1045	17	S	n/a
RA-JS-02-1-3 MSD	8/1/08	1045	18	S	n/a
RA-SD-01-1-5-3-0	8/1/08	1005	19	S	n/a
RA-SD-01-1-5-3-0 MSD	8/1/08	1005	20	S	n/a
Circle method (right); provide additional information as needed (comments). No. of Containers (Indicate type... HCl, etc.)					
VOCs SW8260B BTEX (only) SW8021B SVOCs SW8270C OC Pesticides SW8081A PCBs SW8082 Herbicides SW8151A Explosives SW8330 TCLP Organics SW1311 SW8260B 8270C 8081A 8151A TCLP Metals by ICP Hg SW6010B 7470 7471 E200.7 Total Metals by ICP Hg SW6010B 7470 E200.7 Dissolved Metals by ICP Hg SW6010B 7470 E200.7 Total Metals by ICP/MS SW6020A E200.8 Hexavalent Chromium SW7196A Alkaline Digest? Y / N Inorganic Anions SW9056 E300.0 (specify in comments) Solids: Total E160.3 TDS E160.1 TSS E160.2 pH SW9040B SW9045C TPH SW8015B GRO DRO (circle one or both) Gross Alpha / Beta SW9310 E900.0 Actinides by Paragon SOP Pu / U / Am / Th / Cm / _____ Tritium E906.0 Total Alpha-Emitting Radium SW9315 E903.0 Radium 226 E903.1 Radium 228 SW9320 E904.0 Strontium 90 (Total RadioSr) D5811-00 Gamma Isotopes E901.1 Radon 222 SM7510Rn Minimum Isotopes 234, 235, 238					
(1) Relinquished By:			(2) Relinquished By:		
Signature _____			Signature _____		
Printed Name _____			Printed Name _____		
Date _____ Time _____			Date _____ Time _____		
Company _____			Company _____		
(1) Received By:			(2) Received By:		
Signature _____			Signature _____		
Printed Name _____			Printed Name _____		
Date _____ Time _____			Date _____ Time _____		
Company _____			Company _____		

Order No. **054807**
Trk # 797198613916

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812207
Initials: LJO Date: 12/26/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES
17. Were the samples shipped on ice?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #4 (RA-JS-05-1-3) Sample time on ID label 0947.
 #11 (RA-SD-02-1.5-3.0) Sample ID on label RA-SD-02-1.5-3.0MS.
 * One 16 oz WMG jar received for all samples. Filled 20% - 100%.
 + Sample #1 (RA-JS-04-0-1) was received with a broken lid. Lid replaced.

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705

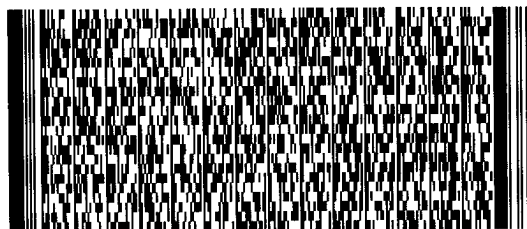


JCL5111268/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812207

5 of 5

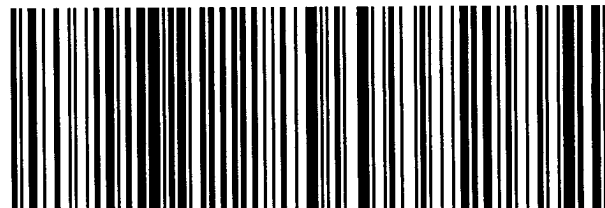
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MPS# 7971 9861 3916

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STANDARD OVERNIGHT

Mstr# 7971 9861 3710 0201

80524**CO-US****DEN****XH FTCA****After printing this label:**

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Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-4MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Final Aliquot: 155 g

Result Units: pCi/g

File Name: 090121d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.030 +/- 0.22	0.40	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-4MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 60 minutes

Final Aliquot: 89.4 g

Result Units: pCi/g

File Name: 090094d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.0036 +/- 0.26	0.50	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-4MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Final Aliquot: 155 g

Result Units: pCi/g

File Name: 090121d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.35 +/- 0.33	0.83	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.048 +/- 0.21	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.14 +/- 0.40	0.83	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6MB

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 191 g

Result Units: pCi/g

File Name: 090107d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.0088 +/- 0.18	0.34	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 191 g

Result Units: pCi/g

File Name: 090107d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.16 +/- 0.32	0.57	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-4LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090062d07

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1060 +/- 125	11.5	986	108	85 - 115	P
10198-40-0	Co-60	501 +/- 58.7	3.84	457	110	85 - 115	P
10045-97-3	Cs-137	406 +/- 47.7	2.52	374	109	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812207-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-4ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090111d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	448 +/- 52.5	2.66	470	95.3	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-4LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090122d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	492 +/- 58.7	12.5	462	106	85 - 115	P
10198-40-0	Co-60	212 +/- 24.9	0.881	214	99.3	85 - 115	P
10045-97-3	Cs-137	176 +/- 20.7	1.22	175	101	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090122d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	452 +/- 53.0	2.54	470	96.2	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090076d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	467 +/- 55.3	7.35	462	101	85 - 115	P
10198-40-0	Co-60	208 +/- 24.4	0.792	214	97.3	85 - 115	P
10045-97-3	Cs-137	181 +/- 21.3	1.18	175	103	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6ALCS

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090111d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	449 +/- 52.6	2.50	470	95.5	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090112d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	475 +/- 56.3	7.11	462	103	85 - 115	P
10198-40-0	Co-60	209 +/- 24.6	0.818	213	98.0	85 - 115	P
10045-97-3	Cs-137	183 +/- 21.6	1.18	175	105	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-0-1
Lab ID: 0812207-5DUP

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 07-Aug-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 210 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090101d04A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.4 +/- 0.42	2.4 +/- 0.41	0.11	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5

Lab ID: 0812207-9DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090108d02A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.5 +/- 0.47	2.2 +/- 0.41	0.55	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1.5-3.0

Lab ID: 0812207-19DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 166 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090123d03A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	3.1 +/- 0.52	2.9 +/- 0.52	0.30	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-0-1
Lab ID: 0812207-5DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 07-Aug-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 210 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090101d04

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.9 +/- 0.56	2.0 +/- 0.51	0.11	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5

Lab ID: 0812207-9DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090108d02

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.6 +/- 0.65	1.3 +/- 0.55	0.40	2.13	M3,G,TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1.5-3.0

Lab ID: 0812207-19DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 166 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090123d03

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.4 +/- 0.65	2.7 +/- 0.73	0.28	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-04-0-1

Lab ID: 0812207-1

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 183 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090107d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.47	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-04-0-1

Lab ID: 0812207-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 183 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090107d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.64	0.97	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-04-1-2.5

Lab ID: 0812207-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 97.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090074d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.67	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-03-1-3

Lab ID: 0812207-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.73	1.1	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-05-1-3

Lab ID: 0812207-4

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 96.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090052d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.1 +/- 0.84	1.5	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-0-1

Lab ID: 0812207-5

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 210 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090151d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.42	0.53	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-0-1

Lab ID: 0812207-5DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 210 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090101d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.41	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-0-1

Lab ID: 0812207-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 210 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090151d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.56	0.97	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-0-1

Lab ID: 0812207-5DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 210 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090101d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.51	0.74	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-5-7

Lab ID: 0812207-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 91.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090031d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.58	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-5-7

Lab ID: 0812207-8

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090067d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.64	1.2	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5

Lab ID: 0812207-9

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 158 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090118d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.47	0.59	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5

Lab ID: 0812207-9DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090108d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.41	0.48	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5

Lab ID: 0812207-9

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 158 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090118d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.65	1.0	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5

Lab ID: 0812207-9DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090108d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.55	1.0	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0

Lab ID: 0812207-11

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 155 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090119d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.44	0.65	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0

Lab ID: 0812207-11

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 155 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090119d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.60	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5

Lab ID: 0812207-12

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 168 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090109d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.49	0.47	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5

Lab ID: 0812207-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 168 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090109d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.60	0.91	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-0-1.0

Lab ID: 0812207-14

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 130 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090120d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.4 +/- 0.62	0.85	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-0-1.0
Lab ID:	0812207-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 130 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090120d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.75	1.5	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3

Lab ID: 0812207-17

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 126 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.4 +/- 0.63	0.79	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3

Lab ID: 0812207-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 126 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	14 +/- 2.2	1.6	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-1.5-3.0
Lab ID:	0812207-19

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 159 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090112d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.1 +/- 0.52	0.54	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1.5-3.0

Lab ID: 0812207-19DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 166 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090123d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.52	0.63	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-1.5-3.0
Lab ID:	0812207-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 159 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090112d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.65	1.2	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1.5-3.0

Lab ID: 0812207-19DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 166 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090123d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.73	0.85	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

Page 6 of 6



March 13, 2009

Mr. Aaron Hilshorst
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-208
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Hilshorst:

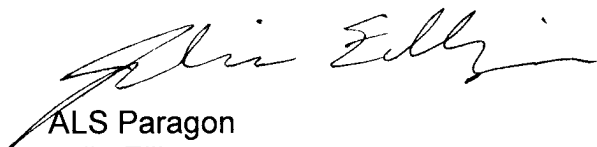
Twenty-seven soil samples were received from Freeport McMoRan Sierrita on December 17, 2008. The samples were scheduled for the following analyses.

Isotopic Uranium	pages 1-44
Gamma Spectroscopy	pages 1-57
Radium-226 by EPA Method 903.1 (m)	pages 1-30

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/mh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812208

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RP-JS-02-5-7	0812208-2		SOIL	12-Aug-08	8:21
RP-JS-02-10-12	0812208-3		SOIL	12-Aug-08	8:37
RP-JS-02-15-17	0812208-4		SOIL	12-Aug-08	8:51
RP-JS-01-1-3	0812208-5		SOIL	12-Aug-08	9:21
RP-JS-01-5-7	0812208-6		SOIL	12-Aug-08	9:40
RP-JS-01-0-1	0812208-7		SOIL	12-Aug-08	9:21
RP-JS-01-10-12	0812208-8		SOIL	12-Aug-08	9:53
RA-JS-05-0-1	0812208-9		SOIL	07-Aug-08	9:46
RP-JS-01-15-17	0812208-10		SOIL	12-Aug-08	10:05
EM-P24-1-3	0812208-11		SOIL	07-Aug-08	10:30
RA-JS-01-1-3	0812208-12		SOIL	07-Aug-08	12:39
RA-JS-03-0-1	0812208-13		SOIL	07-Aug-08	9:17
EM-P24-10-11	0812208-14		SOIL	07-Aug-08	10:56
RP-JS-02-1-3D	0812208-15		SOIL	12-Aug-08	8:11
EM-JS-08-0-1	0812208-16		SOIL	12-Aug-08	13:28
EM-JS-08-1-3D	0812208-17		SOIL	12-Aug-08	13:28
CP-JS-04-0-1	0812208-18		SOIL	27-Aug-08	10:25
CP-JS-04-1-3	0812208-19		SOIL	27-Aug-08	10:25
CP-JS-04-5-7	0812208-21		SOIL	27-Aug-08	10:33
CP-JS-04-10-12	0812208-22		SOIL	27-Aug-08	10:40
CP-JS-04-20	0812208-23		SOIL	27-Aug-08	11:02
OD-JS-03-0-1	0812208-24		SOIL	27-Aug-08	11:30
RP-JS-02-1-3	0812208-25		SOIL	12-Aug-08	8:11
EM-JS-08-1-3	0812208-26		SOIL	12-Aug-08	13:28
EM-JS-07-0-1	0812208-27		SOIL	13-Aug-08	9:14

Project Name/No.: FM-1-12P Turnaround (circle one) Standard or Rush (Due _____) ~~Dispose~~ Date 60 day or Return to Client _____

Sampler(s): 4 wells Sampler(s): 4 wells Sampler(s): _____

Report To: Steven Vaughn

Phone: (520) 907-2845

Fax:

E-mail: steven_vanegas@uscorp.com

Company: Frederick Mc Meran

Address: 6200 W Duval Miss Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers
RA-SD-01-15-30	8/11/08	1005	✓	S	n/a	1
RP-JS-02-0-1	8/12/08	811	✓	S	n/a	1
RP-JS-02-5-7	8/12/08	821	2	S	n/a	1
RP-JS-02-10-12	8/12/08	837	3	S	n/a	1
RP-JS-02-15-17	8/12/08	851	4	S	n/a	1
RP-JS-01-1-3	8/12/08	924	5	S	n/a	1
RP-JS-01-5-7	8/12/08	940	6	S	n/a	1
RP-JS-01-0-1	8/12/08	921	7	S	n/a	1
RP-JS-01-10-12	8/12/08	953	8	S	n/a	1
RA-JS-05-0-1	8/17/08	946	9	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-s

Comments:

Order No. 050827

Trk # 7971 9861 3710



PARAGON ANALYTICALS
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Paragon
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812208

Date: 12-19-08 Page 2 of 3

Project Name/No.: FAI-VLP		Sampler(s): Kivalash		Turnaround (circle one): Standard or Rush (Due Date: 12-19-08)		Disposer: Date 12-19-08 or Return to Client	
Report To: Steven Vaughn		E-mail: Steven.Vaughn@paragoncorp.com		Company: Feeport McMoran		Address: 6200 W Duval Mile Rd Green Valley, AZ 85614	
Phone: (520) 407-2845		Fax:					
Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers	
RP-JS-01-15-17	8/12/08	1005	10	S	n/a	1	
EM-P24-1-3	8/7/08	1030	11	S	n/a	1	
PA-JS-01-1-3	8/7/08	1239	12	S	n/a	1	
PA-JS-03-0-1	8/7/08	917	13	S	n/a	1	
EM-P24-10-11	8/7/08	1056	14	S	n/a	1	
RP-JS-02-1-3 D	8/12/08	811	15	S	n/a	1	
EM-JS-08-0-1	8/12/08	1328	16	S	n/a	1	
EM-JS-08-1-3 D	8/12/08	1328	17	S	n/a	1	
CP-JS-04-0-1	8/27/08	1025	18	S	n/a	1	
CP-JS-04-1-3	8/27/08	1025	19	S	n/a	1	
Circle method (right); provide additional information as needed (comments).							
VOCs	SW8260B						
BTEX (only)	SW8021B						
SVOCs	SW8270C						
OC Pesticides	SW8081A						
PCBs	SW8082						
Herbicides	SW8151A						
Explosives	SW8330						
TCLP Organics	SW8260B 8270C 8081A 8151A						
TCLP Metals	SW6010B 7470						
Total Metals by ICP/Hg	SW6010B 7470 7471 E200.7						
Dissolved Metals by ICP/Hg	SW6010B 7470 E200.7						
Total Metals by ICP/MS	SW6020A E200.8						
Dissolved Metals by ICP/MS	SW6020A E200.8						
Hexavalent Chromium	SW7196A Alkaline Digest? Y / N						
Inorganic Anions	SW9056 E300.0 (specify in comments)						
Solids:	Total E160.3 TDS E160.1 TSS E160.2						
pH	SW9040B SW9045C						
TPH	SW8015B GRO DRO (circle one or both)						
Gross Alpha / Beta	SW9310 E900.0						
Actinides by Paragon SOP	Pu / U / Am / Th / Cm /						
Tritium	E906.0						
Total Alpha-Emitting Radium	SW9315 E903.0						
Radium 226	E903.1						
Radium 228	SW9320 E904.0						
Sr-90 (Total RadioSr)	D5811-00						
Gamma Isotopes	E901.1						
Radon 222	SM7510Rn						
Maximum Isotope	234, 235, 238						
Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments:							
Order No. 050807							
Tik# 797198613710							
Relinquished By: (1) Signature: Kevin L. Lohr Printed Name: Kevin Lohr Date: 12-19-08 Time: 1600 Company: ALS							(2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____
Received By: (1) Signature: _____ Printed Name: _____ Date: 12/20/08 Time: 1000 Company: ALS							(2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____



PARAGON
ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812208

Date: 12-19-08 Page 3 of 3

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Project Name/No.: FMI-V-137 Sampler(s): K. W. Welch Turnaround (circle one) Standard or Rush (Due) Dispose? Date 12/23/08 or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: Steven_Vaughn@curcorp.com
Company: Freepart McMoran
Address: 6200 W Duval Ave Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-JS-04-1-3	8/21/08	1025	204	5	w/a	1
CP-JS-04-5-7	8/21/08	1033	21	5	w/a	2
CP-JS-04-10-12	8/21/08	1040	22	5	w/a	1
CP-JS-04-15-17	8/21/08	1052	✓	5	w/a	1
CP-JS-04-20	8/21/08	1102	23	5	w/a	1
OD-JS-03-1-3 D	8/21/08	1130	✓	5	w/a	1
OD-JS-03-0-1	8/21/08	1130	24	5	w/a	1
RP-JS-02-1-3	8/21/08	811	25	5	w/a	1
EM-JS-08-1-3	8/21/08	1328	26	5	w/a	1
EM-JS-07-0-1	8/21/08	914	27	5	w/a	1

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter		Relinquished By: (1)		Relinquished By: (2)	
Signature		Signature		Signature	
Printed Name Kevin A. A. A.		Printed Name		Printed Name	
Date 12-19-08 Time 1600		Date		Date	
Company ALS		Company		Company	
Received By: (1)		Received By: (2)		Received By: (2)	
Signature		Signature		Signature	
Printed Name Tara Jordan		Printed Name		Printed Name	
Date 12/26/08 Time 1600		Date		Date	
Company ALS Paragon		Company		Company	

Order No. 054807

-ck# 797198613710

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Free portWorkorder No: 0812208Project Manager: JmeInitials: LJODate: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u>
3. Are Custody seals on sample containers intact?	<u>NONE</u>	<u>YES</u>
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	<u>NO</u>
5. Are the COC and bottle labels complete and legible?	<u>YES</u>	<u>NO</u>
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u>
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u>	<u>YES</u>
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u>	<u>YES</u>
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	<u>NO</u>
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	<u>NO</u>
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<u>N/A</u>	<u>YES</u>
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	<u>YES</u>
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	<u>YES</u>
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	<u>YES</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>13</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no, see Form 008.)		

+ see page 2 of 2

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #17 and 26 (EM-JS-08-1-3D and EM-JS-08-1-3) No sample time was listed on the ID labels.

Sample #9 (RA-JS-05-0-1) Sample time on ID label 0947.

• One 16oz WMG was received for all samples filled 20% - 100%.

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: Jme

Workorder No: 0812208
Initials: LJU Date: 12/20/08

Additional Information:

+ Samples RP-JS-02-0-1, CP-JS-04-15-17, and OD-JS-03-1-3D
were received broken.

Headspace:

Paragon Sample ID	Client Sample ID	Requested Analyses	Temperature °C	Cooler Number

If applicable, was the client contacted? ☒ YES / NO / NA Contact: rick Smith Date/Time: pm

Project Manager Signature / Date: [Signature] 12/23/08

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



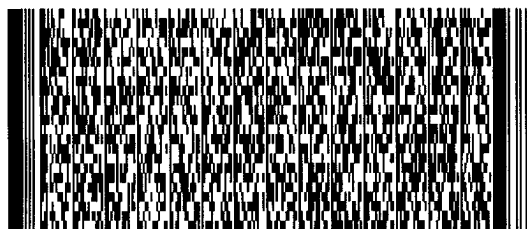
JCL5111208/20/23

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812208

4 of 5

MON - 22DEC

AA

MPS# 7962 0209 9000
 0263

STANDARD OVERNIGHT

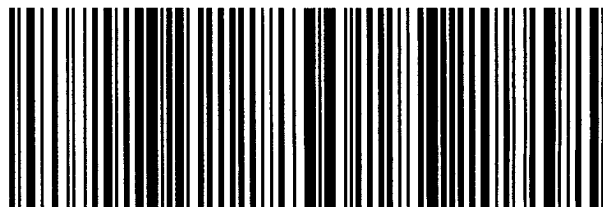
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

Freeport McMoRan Sierrita

FMI-VRP

Work Order Number: 0812208

1. This report consists of the analytical results for 14 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/11/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. The radiometric recovery for the matrix spike of sample 0812208-13 is above the upper control limit of 126% at 131%. All other quality control criteria have been met. ALS Paragon does not control on matrix spike recovery. The result for this sample is considered an estimated value and is included in this data package
5. The duplicate error ratio (DER) for sample 0812208-22 and its duplicate was elevated above our warning limit of 1.42 at 1.79. DER is defined as:

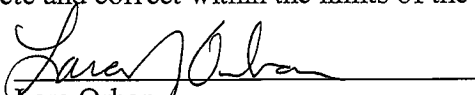
$$DER = \frac{|S - D|}{2 * \sqrt{S_s^2 + S_d^2}}$$

Where: S = sample result, D = duplicate result, σ_s = 1 sigma uncertainty of sample result, and σ_D = 1 sigma uncertainty of the duplicate result. Results are acceptable according to SOP715R15.

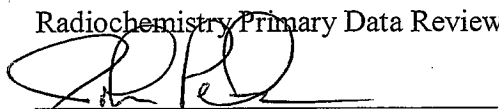
6. No further anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer

3/12/09
Date


Radiochemistry Final Data Reviewer

03/13/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812208

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RP-JS-01-15-17	0812208-10		SOIL	12-Aug-08	10:05
EM-P24-1-3	0812208-11		SOIL	07-Aug-08	10:30
RA-JS-01-1-3	0812208-12		SOIL	07-Aug-08	12:39
RA-JS-03-0-1	0812208-13		SOIL	07-Aug-08	9:17
EM-P24-10-11	0812208-14		SOIL	07-Aug-08	10:56
RP-JS-02-1-3D	0812208-15		SOIL	12-Aug-08	8:11
EM-JS-08-0-1	0812208-16		SOIL	12-Aug-08	13:28
EM-JS-08-1-3D	0812208-17		SOIL	12-Aug-08	13:28
CP-JS-04-0-1	0812208-18		SOIL	27-Aug-08	10:25
CP-JS-04-1-3	0812208-19		SOIL	27-Aug-08	10:25
RP-JS-02-5-7	0812208-2		SOIL	12-Aug-08	8:21
CP-JS-04-5-7	0812208-21		SOIL	27-Aug-08	10:33
CP-JS-04-10-12	0812208-22		SOIL	27-Aug-08	10:40
CP-JS-04-20	0812208-23		SOIL	27-Aug-08	11:02
OD-JS-03-0-1	0812208-24		SOIL	27-Aug-08	11:30
RP-JS-02-1-3	0812208-25		SOIL	12-Aug-08	8:11
EM-JS-08-1-3	0812208-26		SOIL	12-Aug-08	13:28
EM-JS-07-0-1	0812208-27		SOIL	13-Aug-08	9:14
RP-JS-02-10-12	0812208-3		SOIL	12-Aug-08	8:37
RP-JS-02-15-17	0812208-4		SOIL	12-Aug-08	8:51
RP-JS-01-1-3	0812208-5		SOIL	12-Aug-08	9:21
RP-JS-01-5-7	0812208-6		SOIL	12-Aug-08	9:40
RP-JS-01-0-1	0812208-7		SOIL	12-Aug-08	9:21
RP-JS-01-10-12	0812208-8		SOIL	12-Aug-08	9:53
RA-JS-05-0-1	0812208-9		SOIL	07-Aug-08	9:46



ALS Paragon

ALS Laboratory Group



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812208

Date: 12-19-08

Page 1 of 3

Project Name/No.: FMI-VZP		Sampler(s): K. Wicks		Turnaround (circle one) Standard or Rush (Due)		Dispose: Date 60 day or Return to Client	
Report To: Steven Vaughn Phone: (520) 407-2875 Fax: E-mail: steven_v Vaughn@uscorp.com Company: Freepart Mc Moran Address: 6200 W Duval Mine Rd. Green Valley, AZ 85614							
Sample ID	Date	Time	Lab ID	Matrix	Preservative	No. of Containers	
RA-SD-01-15-30	8/11/08	10:05	✓	S	n/a	1	
ICP-JS-02-0-1	8/12/08	8:11	✓	S	n/a	1	
RP-JS-02-5-7	8/12/08	8:21	2	S	n/a	1	
RP-JS-02-10-12	8/12/08	8:37	3	S	n/a	1	
RP-JS-02-15-17	8/12/08	8:51	4	S	n/a	17	
RP-JS-01-1-3	8/12/08	9:21	5	S	n/a	1	
RP-JS-01-5-7	8/12/08	9:40	6	S	n/a	1	
RP-JS-01-0-1	8/12/08	9:21	7	S	n/a	1	
RP-JS-01-10-12	8/12/08	9:53	8	S	n/a	1	
VA-JS-05-0-1	8/17/08	9:46	9	S	n/a	1	
*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments:							
Order No. 0548VT							
Tick # 7971 9861 3710							
Reinforced By: (1) Signature: K. Wicks Printed Name: K. Wicks Date: 12-19-08 Time: 1600 Company: ALS							(2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____
Received By: (1) Signature: J. J. Orban Printed Name: J. J. Orban Date: 12/20/08 Time: 1000 Company: ALS Paragon							(2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812208

Page 2 of 3

Date: 12-19-08

Project Name/No.: F01-02P Sampler(s): Kinkadee Turnaround (circle one): Standard or Rush (Due) Disposer: Date 60 day or Return to Client

Report To: Steven Vaughan
Phone: (920) 407-2845
Fax:
E-mail: Steven.Vaughan@corporate.com
Company: Freepoint McMoran
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers
RP-JS-01-15-17	8/2/08	1005	10	S	N/A	1
EM-P24-1-3	8/7/08	1030	11	S	N/A	1
PA-JS-01-1-3	8/7/08	1239	12	S	N/A	1
PA-JS-03-0-1	8/7/08	917	13	S	N/A	1
EM-P24-10-11	8/7/08	1056	14	S	N/A	1
RP-JS-02-1-3 D	8/12/08	811	15	S	N/A	1
EM-JS-08-0-1	8/12/08	1328	16	S	N/A	1
EM-JS-08-1-3 D	8/12/08	1328	17	S	N/A	1
CP-JS-04-0-1	8/27/08	1025	18	S	N/A	1
CP-JS-04-1-3	8/27/08	1025	19	S	N/A	1

*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments:

Order No. 050808

Tik# 797198613710

VOCS	SW8260B																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Relinquished By:	Relinquished By:
Signature	Signature
Printed Name	Printed Name
Date	Date
Company	Company
Received By:	Received By:
Signature	Signature
Printed Name	Printed Name
Date	Date
Company	Company

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Free port
Project Manager: JmeWorkorder No: 0812208
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u> a
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> + see page 2 of 2
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>13</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #17 and 26 (EM-JS-08-1-3D and EM-JS-08-1-3) No sample time was listed on the ID labels.

Sample #9 (RA-JS-05-0-1) Sample time on ID label 0947.

• One 16oz WMG was received for all samples filled 20% - 100%.

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812208
Initials: LJU Date: 12/20/08

Additional Information:

+ Samples RP-JS-02-0-1, CP-JS-04-15-17, and OD-JS-03-1-3D
were received broken.

Headspace:

Paragon Sample ID	Client Sample ID	Requested Analyses	Temperature °C	Cooler Number

If applicable, was the client contacted? ☒ YES ☐ NO / NA Contact: Rick Smith Date/Time: pm

Project Manager Signature / Date:

Jme 12/23/08

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



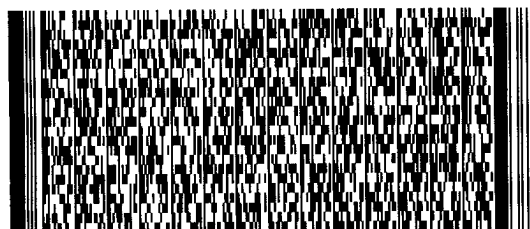
JCL511288/20/23

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812208

4 of 5

MON - 22DEC

AA

MPS# 7962 0209 9000
 0263

STANDARD OVERNIGHT

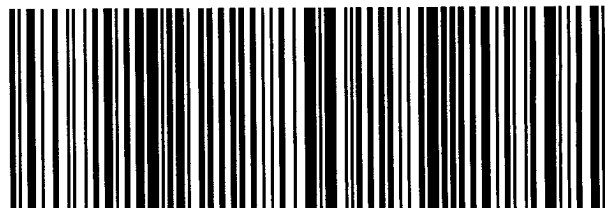
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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-2MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.17 +/- 0.30	0.61	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812208-1

Date Printed: Thursday, March 12, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	35.5 +/- 6.63	0.547	43.2	82.2	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812208-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3D

Lab ID: 0812208-15MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 12-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	55.7	0.71	0.548	42.0	131	57 - 126	N

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812208-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-0-1
Lab ID: 0812208-16DUP

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.9 +/- 0.61	2.1 +/- 0.64	0.25	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-10-12

Lab ID: 0812208-22DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 27-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	0.88 +/- 0.43	2.6 +/- 0.87	1.79	2.13	W

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-5-7
Lab ID:	0812208-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.69	0.65	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RP-JS-01-5-7
Lab ID:	0812208-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.54	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RP-JS-01-0-1
Lab ID:	0812208-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.65	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RA-JS-05-0-1
Lab ID:	0812208-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.65	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-P24-1-3
Lab ID:	0812208-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.55	0.20	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-1-3
Lab ID:	0812208-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.61	0.20	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RA-JS-03-0-1
Lab ID:	0812208-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.8 +/- 1.5	0.82	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-P24-10-11	Sample Matrix: SOIL	Prep Batch: RE090220-2	Final Aliquot: 1.09 g
Lab ID: 0812208-14	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-2-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: RE090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 02-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.75	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-1-3D
Lab ID:	0812208-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.71 +/- 0.40	0.51	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-0-1
Lab ID:	0812208-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.61	0.43	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-0-1

Lab ID: 0812208-16DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 12-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.64	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812208-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

Page 1 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-JS-04-0-1
Lab ID:	0812208-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 27-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.69	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-04-10-12	Sample Matrix: SOIL	Prep Batch: RE090220-2	Final Aliquot: 1.04 g
Lab ID: 0812208-22	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-2-1	Prep Basis: Dry Weight
	Date Collected: 27-Aug-08	Run ID: RE090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 02-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.88 +/- 0.43	0.52	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-10-12

Lab ID: 0812208-22DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 27-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.87	0.49	1	W

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812208-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

Page 2 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-1-3
Lab ID:	0812208-25

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.79	0.43	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-0-1
Lab ID:	0812208-27

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.6 +/- 1.1	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812208-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

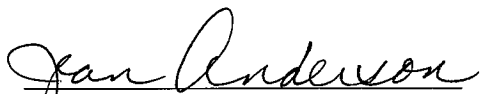
Work Order Number: 0812208

1. This report consists of the analytical results for 25 soil samples received by ALS Paragon on 12/20/2008.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to activity detected in prescreen and to reduce possible matrix interference, the samples were prepared at a reduced aliquot of ~1 gram or less..
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 02/23/2009.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. Uranium-238 activity is reported in method blank AS090210-3MB and U-235 activity is reported in method blank AS090217-1MB above the minimum detectable concentration value. The measured blank activity is below the requested MDC of 0.1 pCi/g. Results are acceptable according to SOP715R15, and are submitted without further qualification.
7. The requested MDC of 0.1 pCi/g was not met for U-238 for sample 0812208-21 and U-234 for sample 0812208-22. The reported activity for these samples is greater than the achieved MDC. These samples are identified with an "M3" flag on the final reports.
8. No further anomalous situations were encountered during the preparation or analysis of these

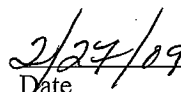


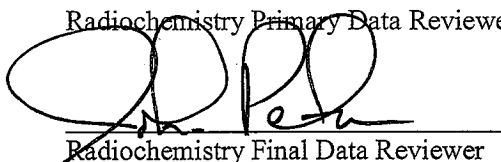
samples. All remaining quality control criteria were met.

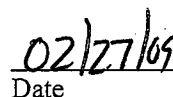
The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



Jean Anderson
Radiochemistry Primary Data Reviewer


Date


Radiochemistry Final Data Reviewer


Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812208

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RP-JS-02-5-7	0812208-2		SOIL	12-Aug-08	8:21
RP-JS-02-10-12	0812208-3		SOIL	12-Aug-08	8:37
RP-JS-02-15-17	0812208-4		SOIL	12-Aug-08	8:51
RP-JS-01-1-3	0812208-5		SOIL	12-Aug-08	9:21
RP-JS-01-5-7	0812208-6		SOIL	12-Aug-08	9:40
RP-JS-01-0-1	0812208-7		SOIL	12-Aug-08	9:21
RP-JS-01-10-12	0812208-8		SOIL	12-Aug-08	9:53
RA-JS-05-0-1	0812208-9		SOIL	07-Aug-08	9:46
RP-JS-01-15-17	0812208-10		SOIL	12-Aug-08	10:05
EM-P24-1-3	0812208-11		SOIL	07-Aug-08	10:30
RA-JS-01-1-3	0812208-12		SOIL	07-Aug-08	12:39
RA-JS-03-0-1	0812208-13		SOIL	07-Aug-08	9:17
EM-P24-10-11	0812208-14		SOIL	07-Aug-08	10:56
RP-JS-02-1-3D	0812208-15		SOIL	12-Aug-08	8:11
EM-JS-08-0-1	0812208-16		SOIL	12-Aug-08	13:28
EM-JS-08-1-3D	0812208-17		SOIL	12-Aug-08	13:28
CP-JS-04-0-1	0812208-18		SOIL	27-Aug-08	10:25
CP-JS-04-1-3	0812208-19		SOIL	27-Aug-08	10:25
CP-JS-04-5-7	0812208-21		SOIL	27-Aug-08	10:33
CP-JS-04-10-12	0812208-22		SOIL	27-Aug-08	10:40
CP-JS-04-20	0812208-23		SOIL	27-Aug-08	11:02
OD-JS-03-0-1	0812208-24		SOIL	27-Aug-08	11:30
RP-JS-02-1-3	0812208-25		SOIL	12-Aug-08	8:11
EM-JS-08-1-3	0812208-26		SOIL	12-Aug-08	13:28
EM-JS-07-0-1	0812208-27		SOIL	13-Aug-08	9:14



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812208

Date: 12-19-08

Page 1 of 3

Project Name/No.: FMI-VZP		Sampler(s): K. Wicks		Turnaround (circle one) Standard or Rush (Due)		Dispose: Date 60 day or Return to Client	
Report To: Steven Vaughn Phone: (520) 407-2875 Fax: E-mail: steven_v Vaughn@uscorp.com Company: Freepart Mc Moran Address: 6200 W Duval Mine Rd. Green Valley, AZ 85614							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers	
RA-SD-01-15-30	8/11/08	10:05	1	S	n/a	1	
ICP-JS-02-0-1	8/12/08	8:11	1	S	n/a	1	
RP-JS-02-5-7	8/12/08	8:21	2	S	n/a	1	
RP-JS-02-10-12	8/12/08	8:37	3	S	n/a	1	
RP-JS-02-15-17	8/12/08	8:51	4	S	n/a	1	
RP-JS-01-1-3	8/12/08	9:21	5	S	n/a	1	
RP-JS-01-5-7	8/12/08	9:40	6	S	n/a	1	
RP-JS-01-0-1	8/12/08	9:21	7	S	n/a	1	
RP-JS-01-10-12	8/12/08	9:53	8	S	n/a	1	
VA-JS-05-0-1	8/17/08	9:46	9	S	n/a	1	
*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments:							
Order No. 0548VT							
Tick # 7971 9861 3710							
Relinquished By: (1) Signature: K. Wicks Printed Name: K. Wicks Date: 12-19-08 Time: 1600 Company: ALS							(2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____
Received By: (1) Signature: J. J. Orban Printed Name: J. J. Orban Date: 12/20/08 Time: 1000 Company: ALS Paragon							(2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____



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Chain-of-Custody

LAB ID

0812208

Page 2 of 3

Date: 12-19-08

Project Name/No.: F01-02P Sampler(s): Kinkadee Turnaround (circle one): Standard or Rush (Due) Disposer: Date 60 day or Return to Client

Report To: Steven Vaughan
Phone: (920) 407-2845
Fax:
E-mail: Steven.Vaughan@corporate.com
Company: Freepert-McMann
Address: 6200 W Duval Ave R2
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time	Lab ID	Matrix	Preservative	No. of Containers
RP-JS-01-15-17	8/2/08	1005	10	S	N/A	1
EM-P24-1-3	8/2/08	1030	11	S	N/A	1
PA-JS-01-1-3	8/2/08	1239	12	S	N/A	1
PA-JS-03-0-1	8/2/08	917	13	S	N/A	1
EM-P24-10-11	8/2/08	1056	14	S	N/A	1
RP-JS-02-1-3 D	8/2/08	811	15	S	N/A	1
EM-JS-08-0-1	8/2/08	1328	16	S	N/A	1
EM-JS-08-1-3 D	8/2/08	1328	17	S	N/A	1
CP-JS-04-0-1	8/2/08	1025	18	S	N/A	1
CP-JS-04-1-3	8/2/08	1025	19	S	N/A	1

*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments:

Order No. 05080T

Tik# 797198613710

VOCS	SW8260B	BTEX (only)	SW8021B	SVOCs	SW8270C	OC Pesticides	SW8081A	PCBs	SW8082	Herbicides	SW8151A	Explosives	SW8330	TCLP Organics SW1311	SW8260B 8270C 8081A 8151A	TCLP Metals SW1311 Hg	SW6010B 7470	Total Metals by ICP Hg	SW6010B 7470 7471 E200.7	Dissolved Metals by ICP Hg	SW6020A E200.8	Total Metals by ICP/MS	SW6020A E200.8	Dissolved Metals by ICP/MS	SW6020A E200.8	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	Total E160.3 TDS E160.1 TSS E160.2	pH	SW9040B SW9045C	TPH	SW8015B GRO DRO (circle one or both)	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Uranium Isotopes	234, 235, 238
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(1) Relinquished By:		(2)	
Signature	Signature	Signature	Signature
Printed Name	Printed Name	Printed Name	Printed Name
Date	Date	Date	Date
Company	Company	Company	Company
(1) Received By:		(2)	
Signature	Signature	Signature	Signature
Printed Name	Printed Name	Printed Name	Printed Name
Date	Date	Date	Date
Company	Company	Company	Company



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LAB ID

0812208

Date: 12-19-08 Page 3 of 3

Project Name/No.: FMI-VZP Sampler(s): K. W. W. Turnaround (circle one) Standard or Rush (Due) Dispose? Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: steven_vaughn@paragoncorp.com
Company: Freepoint McMoran
Address: 6200 W Duval Ave RD
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers
CP-JS-04-1-3	8/27/08	1025	204	S	N/A	1
CP-JS-04-5-7	8/27/08	1033	21	S	N/A	2
CP-JS-04-10-12	8/27/08	1040	22	S	N/A	1
CP-JS-04-15-17	8/27/08	1052	✓	S	N/A	1
CP-JS-04-20	8/27/08	1102	23	S	N/A	1
OD-JS-03-1-3 D	8/27/08	1130	✓	S	N/A	1
OD-JS-03-0-1	8/27/08	1130	24	S	N/A	1
RP-JS-02-1-3	8/27/08	811	25	S	N/A	1
EM-JS-08-1-3	8/27/08	1328	26	S	N/A	1
EM-JS-07-0-1	8/27/08	914	27	S	N/A	1

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers	Relinquished By: (1)	Relinquished By: (2)
CP-JS-04-1-3	8/27/08	1025	204	S	N/A	1	Signature: <u>K. W. W.</u> Printed Name: <u>Kevin W. W.</u> Date: <u>12-19-08</u> Time: <u>1600</u> Company: <u>ALS</u>	Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____
OD-JS-03-1-3 D	8/27/08	1130	✓	S	N/A	1	Signature: <u>Anna Nolan</u> Printed Name: <u>Anna J. Nolan</u> Date: <u>12/26/08</u> Time: <u>1600</u> Company: <u>ALS Paragon</u>	Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____

Comments:

Order No. 054827

-(k# 797198613710

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Free port
Project Manager: JmeWorkorder No: 0812208
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u> a
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> + see page 2 of 2
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>13</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #17 and 26 (EM-JS-08-1-3D and EM-JS-08-1-3) No sample time was listed on the ID labels.

Sample #9 (RA-JS-05-0-1) Sample time on ID label 0947.

• One 16oz WMG was received for all samples filled 20% - 100%.

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812208
Initials: LJU Date: 12/20/08

Additional Information:

+ Samples RP-JS-02-0-1, CP-JS-04-15-17, and OD-JS-03-1-3D
were received broken.

Headspace:

Paragon Sample ID	Client Sample ID	Requested Analyses	Temperature °C	Cooler Number

If applicable, was the client contacted? ☒ YES ☐ NO ☐ NA Contact: Rick Smith Date/Time: pm

Project Manager Signature / Date:

Jme 12/23/08

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



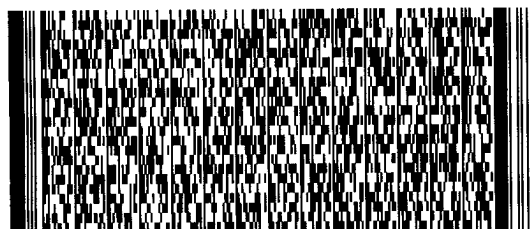
JCL511288/20/23

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812208

4 of 5

MON - 22DEC

AA

MPS# 7962 0209 9000
 0263

STANDARD OVERNIGHT

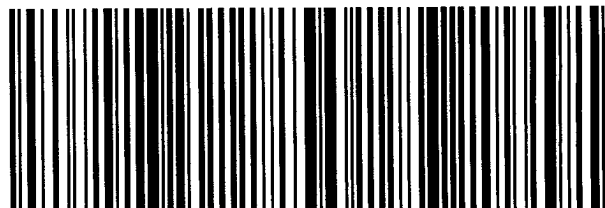
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090210-3MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 10-Feb-09

Date Prepared: 10-Feb-09

Date Analyzed: 19-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Final Aliquot: 0.704 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.0046 +/- 0.016	0.035	0.1	U
15117-96-1	U-235	0.0018 +/- 0.018	0.029	0.1	U
7440-61-1	U-238	0.025 +/- 0.021	0.024	0.1	B3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	6.414	5.71	pCi/g	89.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812208-1

Date Printed: Friday, February 27, 2009

ALS Paragon
LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090217-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Feb-09

Date Prepared: 17-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Final Aliquot: 1.00 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.019 +/- 0.025	0.043	0.1	U
15117-96-1	U-235	0.021 +/- 0.026	0.019	0.1	B3
7440-61-1	U-238	0.0042 +/- 0.022	0.032	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.495	3.74	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812208-1

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090210-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 10-Feb-09

Date Prepared: 10-Feb-09

Date Analyzed: 19-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Final Aliquot: 0.704 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	6.39 +/- 1.06	0.0404	6.16	104	82 - 122	P
7440-61-1	U-238	6.33 +/- 1.05	0.0463	6.40	98.9	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	6.414	4.21	pCi/g	65.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812208-1

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090217-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Feb-09

Date Prepared: 17-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Final Aliquot: 1.00 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.23 +/- 0.757	0.0415	4.32	97.9	82 - 122	P
7440-61-1	U-238	4.36 +/- 0.778	0.0306	4.48	97.2	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.495	3.74	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812208-1

Date Printed: Friday, February 27, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-1-3

Lab ID: 0812208-5DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.4 +/- 0.29	1.3 +/- 0.28	0.30	2.13	
15117-96-1	U-235	0.084 +/- 0.051	0.045 +/- 0.036	0.62	2.13	LT
7440-61-1	U-238	1.2 +/- 0.26	1.3 +/- 0.27	0.18	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812208-1

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3D

Lab ID: 0812208-15DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.0 +/- 0.19	0.90 +/- 0.20	0.51	2.13	
15117-96-1	U-235	0.051 +/- 0.028	0.012 +/- 0.026	1.01	2.13	U
7440-61-1	U-238	0.98 +/- 0.18	0.88 +/- 0.19	0.35	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812208-1

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3
Lab ID: 0812208-26DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	0.93 +/- 0.18	0.92 +/- 0.18	0.03	2.13	
15117-96-1	U-235	0.042 +/- 0.029	0.052 +/- 0.032	0.22	2.13	LT
7440-61-1	U-238	0.97 +/- 0.19	0.78 +/- 0.15	0.79	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
DER - Duplicate Error Ratio (see PAI SOP 715)
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-5-7
Lab ID:	0812208-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.27	0.084	0.1	
15117-96-1	U-235	0.075 +/- 0.049	0.048	0.1	LT
7440-61-1	U-238	1.4 +/- 0.28	0.060	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.480	3.71	pCi/g	82.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-10-12
Lab ID:	0812208-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.1 +/- 0.56	0.054	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.042	0.1	
7440-61-1	U-238	3.2 +/- 0.59	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.502	3.97	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-15-17
Lab ID:	0812208-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.049	0.1	
15117-96-1	U-235	0.10 +/- 0.058	0.049	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.493	3.89	pCi/g	86.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-01-1-3
Lab ID:	0812208-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.041	0.1	
15117-96-1	U-235	0.084 +/- 0.051	0.043	0.1	LT
7440-61-1	U-238	1.2 +/- 0.26	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.508	4.00	pCi/g	88.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-1-3

Lab ID: 0812208-5DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.28	0.031	0.1	
15117-96-1	U-235	0.045 +/- 0.036	0.019	0.1	LT
7440-61-1	U-238	1.3 +/- 0.27	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.496	4.02	pCi/g	89.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-01-5-7
Lab ID:	0812208-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.70 +/- 0.19	0.063	0.1	
15117-96-1	U-235	0.042 +/- 0.044	0.060	0.1	U
7440-61-1	U-238	0.80 +/- 0.21	0.057	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.499	2.84	pCi/g	63.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-01-0-1
Lab ID:	0812208-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.28	0.043	0.1	
15117-96-1	U-235	0.18 +/- 0.077	0.019	0.1	
7440-61-1	U-238	1.2 +/- 0.26	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.477	3.72	pCi/g	83.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-01-10-12
Lab ID:	0812208-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.21	0.016	0.1	
15117-96-1	U-235	0.057 +/- 0.027	0.0081	0.1	LT
7440-61-1	U-238	1.2 +/- 0.21	0.0069	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.129	3.57	pCi/g	86.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-05-0-1
Lab ID:	0812208-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.523 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.7 +/- 0.63	0.015	0.1	
15117-96-1	U-235	0.20 +/- 0.082	0.052	0.1	
7440-61-1	U-238	3.5 +/- 0.60	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.634	6.92	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-01-15-17
Lab ID:	0812208-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.35	0.018	0.1	
15117-96-1	U-235	0.10 +/- 0.041	0.029	0.1	
7440-61-1	U-238	2.1 +/- 0.35	0.025	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.441	3.80	pCi/g	85.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-P24-1-3
Lab ID:	0812208-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.512 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.3 +/- 0.57	0.043	0.1	
15117-96-1	U-235	0.14 +/- 0.066	0.040	0.1	
7440-61-1	U-238	3.4 +/- 0.60	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.817	7.30	pCi/g	82.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-1-3
Lab ID:	0812208-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.500 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.56	0.025	0.1	
15117-96-1	U-235	0.21 +/- 0.11	0.086	0.1	
7440-61-1	U-238	3.2 +/- 0.62	0.073	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.029	4.66	pCi/g	51.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-03-0-1
Lab ID:	0812208-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.32	0.029	0.1	
15117-96-1	U-235	0.092 +/- 0.038	0.0092	0.1	LT
7440-61-1	U-238	1.8 +/- 0.31	0.0078	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.511	3.84	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-P24-10-11
Lab ID:	0812208-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.517 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.38	0.048	0.1	
15117-96-1	U-235	0.12 +/- 0.064	0.062	0.1	
7440-61-1	U-238	2.2 +/- 0.41	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.742	7.71	pCi/g	88.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-1-3D
Lab ID:	0812208-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 23-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.19	0.025	0.1	
15117-96-1	U-235	0.051 +/- 0.028	0.021	0.1	LT
7440-61-1	U-238	0.98 +/- 0.18	0.018	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.86	pCi/g	86.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3D

Lab ID: 0812208-15DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.90 +/- 0.20	0.059	0.1	
15117-96-1	U-235	0.012 +/- 0.026	0.051	0.1	U
7440-61-1	U-238	0.88 +/- 0.19	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.518	2.39	pCi/g	52.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Date Printed: Friday, February 27, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-0-1
Lab ID:	0812208-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.510 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.25	0.034	0.1	
15117-96-1	U-235	0.055 +/- 0.042	0.049	0.1	LT
7440-61-1	U-238	1.2 +/- 0.25	0.072	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.854	8.36	pCi/g	94.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-1-3D
Lab ID:	0812208-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.503 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.22	0.053	0.1	
15117-96-1	U-235	0.063 +/- 0.053	0.075	0.1	U
7440-61-1	U-238	0.96 +/- 0.21	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.977	7.98	pCi/g	89.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-0-1	Sample Matrix: SOIL	Prep Batch: AS090210-3	Final Aliquot: 0.504 g
Lab ID: 0812208-18	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090210-3-1	Prep Basis: Dry Weight
	Date Collected: 27-Aug-08	Run ID: AS090210-3A	Moisture(%): NA
	Date Prepared: 10-Feb-09	Count Time: 600 minutes	Result Units: pCi/g
	Date Analyzed: 17-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.0 +/- 0.55	0.051	0.1	
15117-96-1	U-235	0.081 +/- 0.059	0.076	0.1	LT
7440-61-1	U-238	2.6 +/- 0.48	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.970	7.14	pCi/g	79.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-1-3	Sample Matrix: SOIL	Prep Batch: AS090210-3	Final Aliquot: 0.501 g
Lab ID: 0812208-19	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090210-3-1	Prep Basis: Dry Weight
	Date Collected: 27-Aug-08	Run ID: AS090210-3A	Moisture(%): NA
	Date Prepared: 10-Feb-09	Count Time: 600 minutes	Result Units: pCi/g
	Date Analyzed: 17-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.45	0.073	0.1	
15117-96-1	U-235	0.14 +/- 0.083	0.086	0.1	
7440-61-1	U-238	2.2 +/- 0.45	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.022	5.77	pCi/g	63.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-04-5-7
Lab ID:	0812208-21

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 27-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.517 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	6.4 +/- 1.1	0.087	0.1	
15117-96-1	U-235	0.27 +/- 0.11	0.085	0.1	
7440-61-1	U-238	6.3 +/- 1.1	0.11	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.734	5.41	pCi/g	61.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-04-10-12
Lab ID:	0812208-22

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 27-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.509 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.52	0.11	0.1	M3
15117-96-1	U-235	0.19 +/- 0.078	0.052	0.1	
7440-61-1	U-238	3.1 +/- 0.55	0.077	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.883	7.41	pCi/g	83.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-04-20
Lab ID:	0812208-23

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 27-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.503 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.44	0.054	0.1	
15117-96-1	U-235	0.13 +/- 0.068	0.063	0.1	
7440-61-1	U-238	2.3 +/- 0.43	0.071	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.986	7.48	pCi/g	83.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-03-0-1
Lab ID:	0812208-24

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 27-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.527 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.0 +/- 0.53	0.037	0.1	
15117-96-1	U-235	0.16 +/- 0.072	0.044	0.1	
7440-61-1	U-238	3.0 +/- 0.54	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.580	7.08	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-1-3
Lab ID:	0812208-25

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.19	0.033	0.1	
15117-96-1	U-235	0.046 +/- 0.027	0.0096	0.1	LT
7440-61-1	U-238	0.94 +/- 0.18	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.509	3.87	pCi/g	85.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-1-3
Lab ID:	0812208-26

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.93 +/- 0.18	0.026	0.1	
15117-96-1	U-235	0.042 +/- 0.029	0.031	0.1	LT
7440-61-1	U-238	0.97 +/- 0.19	0.021	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.456	3.48	pCi/g	78.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3

Lab ID: 0812208-26DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.92 +/- 0.18	0.038	0.1	
15117-96-1	U-235	0.052 +/- 0.032	0.037	0.1	LT
7440-61-1	U-238	0.78 +/- 0.15	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.429	3.76	pCi/g	85.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-0-1
Lab ID:	0812208-27

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.508 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.51	0.065	0.1	
15117-96-1	U-235	0.19 +/- 0.084	0.064	0.1	
7440-61-1	U-238	2.5 +/- 0.47	0.054	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.895	7.32	pCi/g	82.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita FMI-VRP


Work Order Number: 0812208

1. The following report consists of analytical results and supporting documentation for 25 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812208-3, -4, -5, -8, -10, -17, -19, -21, -23, -24, and -26 were sealed in steel cans on 12/30/08 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/20/09 is at least 97.78%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.89%.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/21/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volume was insufficient to allow preparation of duplicates in batches GS090106-4 and GS090106-5. Duplicate analyses of samples 0812208-2 and -14 were performed in lieu of prepared duplicates.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples. This is applicable for samples 0812208-3, -4, -5, -8, -10, -17, -19, -21, -23, -24, and -26.
7. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium. This is applicable for samples 0812208-3, -4, -5, -8, -10, -17, -19, -21, -23, -24, and -26.

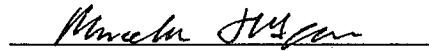


8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. The requested detection limit of 1.0 pCi/gram for ^{228}Ra was not met for many of the samples associated with this work order. The reported activities are greater than the achieved detection limits. The results have been flagged with a "M3" qualifier on the final reports. The results are submitted without further qualification.
11. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer

02/16/09
Date


Radiochemistry Final Data Reviewer

2-16-09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812208

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
RP-JS-02-5-7	0812208-2		SOIL	12-Aug-08	8:21
RP-JS-02-10-12	0812208-3		SOIL	12-Aug-08	8:37
RP-JS-02-15-17	0812208-4		SOIL	12-Aug-08	8:51
RP-JS-01-1-3	0812208-5		SOIL	12-Aug-08	9:21
RP-JS-01-5-7	0812208-6		SOIL	12-Aug-08	9:40
RP-JS-01-0-1	0812208-7		SOIL	12-Aug-08	9:21
RP-JS-01-10-12	0812208-8		SOIL	12-Aug-08	9:53
RA-JS-05-0-1	0812208-9		SOIL	07-Aug-08	9:46
RP-JS-01-15-17	0812208-10		SOIL	12-Aug-08	10:05
EM-P24-1-3	0812208-11		SOIL	07-Aug-08	10:30
RA-JS-01-1-3	0812208-12		SOIL	07-Aug-08	12:39
RA-JS-03-0-1	0812208-13		SOIL	07-Aug-08	9:17
EM-P24-10-11	0812208-14		SOIL	07-Aug-08	10:56
RP-JS-02-1-3D	0812208-15		SOIL	12-Aug-08	8:11
EM-JS-08-0-1	0812208-16		SOIL	12-Aug-08	13:28
EM-JS-08-1-3D	0812208-17		SOIL	12-Aug-08	13:28
CP-JS-04-0-1	0812208-18		SOIL	27-Aug-08	10:25
CP-JS-04-1-3	0812208-19		SOIL	27-Aug-08	10:25
CP-JS-04-5-7	0812208-21		SOIL	27-Aug-08	10:33
CP-JS-04-10-12	0812208-22		SOIL	27-Aug-08	10:40
CP-JS-04-20	0812208-23		SOIL	27-Aug-08	11:02
OD-JS-03-0-1	0812208-24		SOIL	27-Aug-08	11:30
RP-JS-02-1-3	0812208-25		SOIL	12-Aug-08	8:11
EM-JS-08-1-3	0812208-26		SOIL	12-Aug-08	13:28
EM-JS-07-0-1	0812208-27		SOIL	13-Aug-08	9:14



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812208

Date: 12-19-08

Page 1 of 3

Project Name/No.: FMI-VZP		Sampler(s): K. Wicks		Turnaround (circle one) Standard or Rush (Due)		Dispose Date 60 day or Return to Client	
Report To: Steven Vaughn Phone: (520) 407-2875 Fax: E-mail: steven_v Vaughn@uscorp.com Company: Freepart Mc Moran Address: 6200 W Duval Mine Rd. Green Valley, AZ 85614							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	
RA-SD-01-15-30	8/20/08	10:05	1	S	n/a	1	
ICP-JS-02-0-1	8/20/08	8:11	1	S	n/a	1	
RP-JS-02-5-7	8/20/08	8:21	2	S	n/a	1	
RP-JS-02-10-12	8/20/08	8:37	3	S	n/a	1	
RP-JS-02-15-17	8/20/08	8:51	4	S	n/a	17	
RP-JS-01-1-3	8/20/08	9:21	5	S	n/a	1	
RP-JS-01-5-7	8/20/08	9:40	6	S	n/a	1	
RP-JS-01-0-1	8/20/08	9:21	7	S	n/a	1	
RP-JS-01-10-12	8/20/08	9:53	8	S	n/a	1	
VA-JS-05-0-1	8/20/08	9:46	9	S	n/a	1	
*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments:							
Order No. 0548VT							
Tick # 7971 9861 3710							
Reinforced By: (1) Signature: K. Wicks Printed Name: K. Wicks Date: 12-19-08 Time: 1600 Company: ALS							(2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____
Received By: (1) Signature: J. J. Orban Printed Name: J. J. Orban Date: 12/20/08 Time: 1000 Company: ALS Paragon							(2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812208

Page 2 of 3

Date: 12-19-08

Project Name/No.: F01-02P Sampler(s): Kinkadee Turnaround (circle one): Standard or Rush (Due) Disposal Date 60 day or Return to Client

Report To: Steven Vaughan
Phone: (970) 407-2845
Fax:
E-mail: Steven.Vaughan@corporate.com
Company: Freepert-McMann
Address: 6200 W Duval Ave R2
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers
RP-JS-01-15-17	8/2/08	1005	10	S	N/A	1
EM-P24-1-3	8/7/08	1030	11	S	N/A	1
PA-JS-01-1-3	8/7/08	1239	12	S	N/A	1
PA-JS-03-0-1	8/7/08	917	13	S	N/A	1
EM-P24-10-11	8/7/08	1056	14	S	N/A	1
RP-JS-02-1-3 D	8/12/08	811	15	S	N/A	1
EM-JS-08-0-1	8/12/08	1328	16	S	N/A	1
EM-JS-08-1-3 D	8/12/08	1328	17	S	N/A	1
CP-JS-04-0-1	8/27/08	1025	18	S	N/A	1
CP-JS-04-1-3	8/27/08	1025	19	S	N/A	1

(1) Relinquished By:		(2) Relinquished By:	
Signature	Signature	Signature	Signature
Printed Name	Printed Name	Printed Name	Printed Name
Date	Date	Date	Date
Time	Time	Time	Time
Company	Company	Company	Company
(1) Received By:		(2) Received By:	
Signature	Signature	Signature	Signature
Printed Name	Printed Name	Printed Name	Printed Name
Date	Date	Date	Date
Time	Time	Time	Time
Company	Company	Company	Company

Order No. 0508UT

Tik# 797198613710



ALS Paragon

ALS Laboratory Group



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812208

Date: 12-19-08 Page 3 of 3

Project Name/No.: FMI-VZP Sampler(s): K. W. W. Turnaround (circle one) Standard or Rush (Due) Dispose? Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: Steven.Vaughn@univcorp.com
Company: Freepoint McMoran
Address: 6200 W Duval Ave RD
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers
CP-JS-04-1-3	8/27/08	1025	204	5	W/A	1
CP-JS-04-5-7	8/27/08	1033	21	5	W/A	2
CP-JS-04-10-12	8/27/08	1040	22	5	W/A	1
CP-JS-04-15-17	8/27/08	1052	✓	5	W/A	1
CP-JS-04-20	8/27/08	1102	23	5	W/A	1
OD-JS-03-1-3 D	8/27/08	1130	✓	5	W/A	1
OD-JS-03-0-1	8/27/08	1130	24	5	W/A	1
RP-JS-02-1-3	8/27/08	811	25	5	W/A	1
EM-JS-08-1-3	8/27/08	1328	26	5	W/A	1
EM-JS-07-0-1	8/27/08	914	27	5	W/A	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 054827

-(k# 797198613710

SW8260B	VOCs	SW8260B 8270C 8081A 8151A	TCLP Metals SW1311 Hg	SW6010B 7470 E200.7	Total Metals by ICP Hg	SW6010B 7470 E200.7	Dissolved Metals by ICP Hg	SW6020A E200.8	Total Metals by ICP/MS	SW6020A E200.8	Dissolved Metals by ICP/MS	SW7196A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	Total E160.3 TDS E160.1 TSS E160.2	pH	SW9040B SW9045C	TPH	SW8015B GRO DRO (circle one or both)	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW8320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Unlabeled Isotopes 234, 235, 238
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Relinquished By:	Signature	Printed Name	Date	Time	Company
(1)	Kevin Adams	Kevin Adams	12-19-08	1600	ALS
Relinquished By:	Signature	Printed Name	Date	Time	Company
(2)					

Received By:	Signature	Printed Name	Date	Time	Company
(1)	Anna Nolan	Lara J. Urban	12/26/08	1600	ALS
Received By:	Signature	Printed Name	Date	Time	Company
(2)					

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Free port
Project Manager: JmeWorkorder No: 0812208
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u> a
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> + see page 2 of 2
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>13</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Samples #17 and 26 (EM-JS-08-1-3D and EM-JS-08-1-3) No sample time was listed on the ID labels.

Sample #9 (RA-JS-05-0-1) Sample time on ID label 0947.

• One 16oz WMG was received for all samples filled 20% - 100%.

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812208
Initials: LJU Date: 12/20/08

Additional Information:

+ Samples RP-JS-02-0-1, CP-JS-04-15-17, and OD-JS-03-1-3D
were received broken.

Headspace:

Paragon Sample ID	Client Sample ID	Requested Analyses	Temperature °C	Cooler Number

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: pm

Project Manager Signature / Date:

Jme 12/23/08

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



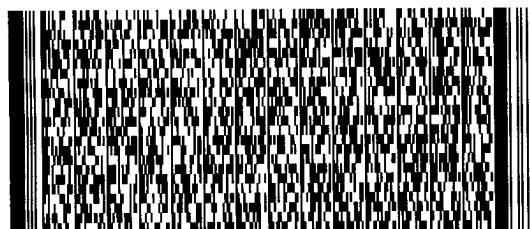
JCL511288/20/23

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812208

4 of 5

MON - 22DEC

AA

MPS# 7962 0209 9000

0263

STANDARD OVERNIGHT

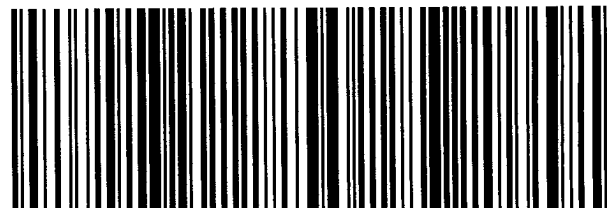
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-4MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 60 minutes

Final Aliquot: 89.4 g

Result Units: pCi/g

File Name: 090094d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.0036 +/- 0.26	0.50	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.048 +/- 0.21	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-5MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Final Aliquot: 88.9 g

Result Units: pCi/g

File Name: 090144d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.20 +/- 0.37	0.65	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.14 +/- 0.40	0.83	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: GS090106-4LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090062d07

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1060 +/- 125	11.5	986	108	85 - 115	P
10198-40-0	Co-60	501 +/- 58.7	3.84	457	110	85 - 115	P
10045-97-3	Cs-137	406 +/- 47.7	2.52	374	109	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812208-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 4

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-5LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090099d07

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1090 +/- 128	13.9	986	110	85 - 115	P
10198-40-0	Co-60	478 +/- 56.0	4.39	456	105	85 - 115	P
10045-97-3	Cs-137	406 +/- 47.7	2.63	374	109	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090122d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	452 +/- 53.0	2.54	470	96.2	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090076d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	467 +/- 55.3	7.35	462	101	85 - 115	P
10198-40-0	Co-60	208 +/- 24.4	0.792	214	97.3	85 - 115	P
10045-97-3	Cs-137	181 +/- 21.3	1.18	175	103	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-5-7

Lab ID: 0812208-2DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 60 minutes

Report Basis: Dry Weight

Final Aliquot: 68.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090060d07

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.5 +/- 0.71	1.3 +/- 0.55	0.25	2.13	M3,G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-10-11

Lab ID: 0812208-14DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d07

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	3.0 +/- 0.78	3.7 +/- 0.92	0.60	2.13	M3,G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-5-7

Lab ID: 0812208-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 68.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.71	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-5-7

Lab ID: 0812208-2DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 60 minutes

Report Basis: Dry Weight

Final Aliquot: 68.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090060d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.55	1.1	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-10-12

Lab ID: 0812208-3

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 151 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090113d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.45	0.49	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-10-12

Lab ID: 0812208-3

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 151 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090113d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.66	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-15-17

Lab ID: 0812208-4

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 149 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090124d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.52	0.71	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-15-17

Lab ID: 0812208-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 149 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090124d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.71	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-01-1-3
Lab ID:	0812208-5

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 145 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090114d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.47	0.55	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-1-3

Lab ID: 0812208-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 145 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090114d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.64	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-5-7

Lab ID: 0812208-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 60 minutes

Report Basis: Dry Weight

Final Aliquot: 80.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090055d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.82 +/- 0.40	0.77	1	LT,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-0-1

Lab ID: 0812208-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 80.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090032d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.53	1.1	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-10-12

Lab ID: 0812208-8

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 154 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090125d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.53	0.69	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-10-12

Lab ID: 0812208-8

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 154 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090125d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.77	1.3	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-05-0-1

Lab ID: 0812208-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090068d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.83	1.5	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-15-17

Lab ID: 0812208-10

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 159 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090115d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.45	0.51	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-15-17

Lab ID: 0812208-10

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 159 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090115d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.0	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-1-3

Lab ID: 0812208-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 110 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.60	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1-3

Lab ID: 0812208-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 63.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090093d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.84	1.4	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-03-0-1

Lab ID: 0812208-13

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090061d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.9 +/- 0.88	1.4	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-10-11

Lab ID: 0812208-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090129d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.0 +/- 0.78	1.0	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-10-11

Lab ID: 0812208-14DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.7 +/- 0.92	1.6	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-1-3D
Lab ID:	0812208-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 65.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.87	1.6	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-0-1

Lab ID: 0812208-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 99.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.63	0.87	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3D

Lab ID: 0812208-17

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090126d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.47	0.59	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3D

Lab ID: 0812208-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090126d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-0-1

Lab ID: 0812208-18

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 96.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.62	0.99	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-1-3

Lab ID: 0812208-19

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 193 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090116d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.41	0.51	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-1-3

Lab ID: 0812208-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 193 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090116d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.53	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-5-7

Lab ID: 0812208-21

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090127d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.0 +/- 0.75	0.62	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-5-7

Lab ID: 0812208-21

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090127d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.67	1.1	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-10-12

Lab ID: 0812208-22

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 111 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090132d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.57	0.66	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-04-20
Lab ID:	0812208-23

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 179 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090119d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.41	0.48	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-20

Lab ID: 0812208-23

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 179 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090119d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.53	0.77	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-03-0-1

Lab ID: 0812208-24

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.42	0.52	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-03-0-1

Lab ID: 0812208-24

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.54	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3

Lab ID: 0812208-25

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 71.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090133d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.74	1.0	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3

Lab ID: 0812208-26

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090073d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.49	0.52	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3

Lab ID: 0812208-26

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090073d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.60	0.71	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-0-1

Lab ID: 0812208-27

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090134d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.58	0.92	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1



March 13, 2009

Mr. Aaron Hilshorst
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-210
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Hilshorst:

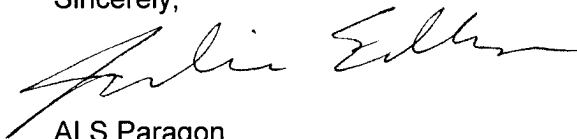
Twenty soil samples were received from Freeport McMoRan Sierrita on December 17, 2008. The samples were scheduled for the following analyses.

Isotopic Uranium	pages 1-30	Radium-228 by Method 9320	pages 1-9
Gamma Spectroscopy	pages 1-42	Radium-226 by EPA Method 903.1 (m)	pages 1-26

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/mh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812210

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-04-5-7	0812210-1		SOIL	05-Aug-08	9:34
C-JS-04-10-12	0812210-2		SOIL	05-Aug-08	9:42
C-JS-04-15-16	0812210-3		SOIL	05-Aug-08	10:33
CS-JS-04-0-1	0812210-4		SOIL	06-Aug-08	9:02
CS-JS-04-1-3	0812210-5		SOIL	06-Aug-08	9:02
CS-JS-04-5-7	0812210-6		SOIL	06-Aug-08	9:10
EM-X26-0-1	0812210-7		SOIL	06-Aug-08	10:00
EM-X26-1-3	0812210-8		SOIL	06-Aug-08	10:00
EM-U25-0-1	0812210-9		SOIL	06-Aug-08	10:59
EM-U25-1-3	0812210-10		SOIL	06-Aug-08	10:59
EM-U25-5-5.5	0812210-11		SOIL	06-Aug-08	11:03
EM-N29-1-3	0812210-12		SOIL	06-Aug-08	13:09
RA-SD-02-1.5-3.0	0812210-16		SOIL	11-Aug-08	9:30
EM-N29-0-1	0812210-17		SOIL	06-Aug-08	13:09
EM-X26-5-7	0812210-18		SOIL	06-Aug-08	10:06
EM-G27-0-1	0812210-19		SOIL	07-Aug-08	8:18
EM-G27-1-3	0812210-20		SOIL	07-Aug-08	8:18



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812210

Date: 12-19-08 Page 1 of 2

Project Name/No.: FMI-VIP Sampler(s): K. Vaughn Turnaround (circle one): Standard or Rush (Due) Dispose Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: steven_vbaugh@urcorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICPMS	Dissolved Metals by ICPMS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Maximum Isotope	
C-35-04-5-7	8/5/08	934	1	S	N/A	1																														
C-35-04-10-12	8/5/08	942	2	S	N/A	1																														
C-35-04-15-16	8/5/08	1033	3	S	N/A	1																														
C-35-04-0-1	8/6/08	902	4	S	N/A	1																														
C-35-04-1-3	8/6/08	902	5	S	N/A	1																														
C-35-04-5-7	8/6/08	910	6	S	N/A	1																														
EM-X26-0-1	8/6/08	1000	7	S	N/A	1																														
EM-X26-1-3	8/6/08	1000	8	S	N/A	1																														
EM-U25-0-1	8/6/08	1059	9	S	N/A	1																														
EM-U25-1-3	8/6/08	1059	10	S	N/A	1																														

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter, Relinquished By: (1) Relinquished By: (2)

Comments: Order No. 0508VT

Signature: Kevin Walsh
Printed Name: Kevin Walsh
Date: 12-19-08 Time: 1600
Company: URS
Received By: Kara Jordan
Signature: Kara Jordan
Printed Name: Kara Jordan
Date: 12/20/08 Time: 1000
Company: ALS Paragon



PARAGON ANALYTICS

ALS Paragon
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812210
Date: 12-19-08 Page 2 of 2

Project Name/No.: <u>EM-1-627</u> Sampler(s): <u>K. Walsh</u> Turnaround (circle one): <u>Standard</u> or Rush (Due _____) Dispose Date <u>60 day</u> or Return to Client _____	
Report To: <u>Steven Vaughn</u> Phone: <u>(520) 407-2845</u> Fax: _____ E-mail: <u>Steven.Vaughn@ALSPARAGON.COM</u> Company: <u>Freepart McMoran</u> Address: <u>6200 W Duvall Mine Rd.</u> <u>Green Valley, AZ 85614</u>	
Circle method (right); provide additional information as needed (comments).	
Sample ID	Date
Time *	Lab ID
Matrix	Preservative
(Indicate type... HCl, etc.)	No. of Containers
VOCs	SW8260B
BTEX (only)	SW8021B
SVOCs	SW8270C
OC Pesticides	SW8081A
PCBs	SW8082
Herbicides	SW8151A
Explosives	SW8330
TCLP Organics SW1311	SW8260B 8270C 8081A 8151A
TCLP Metals SW1311 Hg	SW8010B 7470
Total Metals by ICP Hg	SW8010B 7470 7471 E200.7
Dissolved Metals by ICP Hg	SW8010B 7470 E200.7
Total Metals by ICP/MS	SW8020A E200.8
Dissolved Metals by ICP/MS	SW8020A E200.8
Hexavalent Chromium	SW1796A Alkaline Digest? Y / N
Inorganic Anions	SW9056 E300.0 (specify in comments)
Solids:	Total E160.3 TDS E160.1 TSS E160.2
pH	SW9040B SW9045C
TPH	SW8015B GRO DRO (circle one or both)
Gross Alpha / Beta	SW9310 E900.0
Actinides by Paragon SOP	Pu / U / Am / Th / Cm / _____
Tritium	E906.0
Total Alpha-Emitting Radium	SW9315 E903.0
Radium 226	E903.1
Radium 228	SW9320 E904.0
Sr-90 (Total RadioSr)	DS811-00
Gamma Isotopes	E901.1
Radon 222	SM7510Rn
<u>Mitrium Isotopes 234, 235, 238</u>	
EM-U25-5-55	8/6/08 1103 11 5 w/a 1
EM-N24-1-3	8/6/08 1309 12 5 w/a 1
RA-SD-02-0-15	8/11/08 910 15 5 w/a 1
RA-SD-02-1.5-30 MSD	8/11/08 930 14 6 5 w/a 1
RA-SD-02-0-1.5MS	8/11/08 950 15 5 w/a 1
RA-SD-02-1.5-30	8/11/08 930 16 5 w/a 1
EM-N24-0-1	8/6/08 1309 17 5 w/a 1
EM-X26-5-7	8/6/08 1006 18 5 w/a 1
EM-G27-0-1	8/7/08 818 19 5 w/a 1
EM-G27-1-3	8/7/08 818 20 5 w/a 1

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 050807

Trk # 7971 9861 3846

Relinquished By: <u>K. Walsh</u> (1)		Relinquished By: _____ (2)	
Signature	Printed Name	Signature	Printed Name
Date <u>12-19-08</u>	Time <u>1600</u>	Date _____	Time _____
Company <u>ALPS</u>	Company _____	Company _____	Company _____
Received By: <u>Lara Torban</u> (1)		Received By: _____ (2)	
Signature	Printed Name	Signature	Printed Name
Date <u>12/20/08</u>	Time <u>1000</u>	Date _____	Time _____
Company <u>ALS Paragon</u>	Company _____	Company _____	Company _____

Form 202r6.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812210Project Manager: JmeInitials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<u>NO</u> +
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #15 (RA-SD-02-0-1.5MS) Sample ID on label RA-SD-01-0-1.5MS.
 • One 16 oz WRMG received for all samples Filled 20% - 90%.
 + Samples #10 and 9 (EM-025-1-3 and EM-025-0-1) received with broken lids, lids replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton. SN 29922500201-0066

*IR Gun #4: Oakton. SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111288/26/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

0812210

3 of 5

MON - 22DEC

AA

MPS# 7971 9861 3846
 0263

STANDARD OVERNIGHT

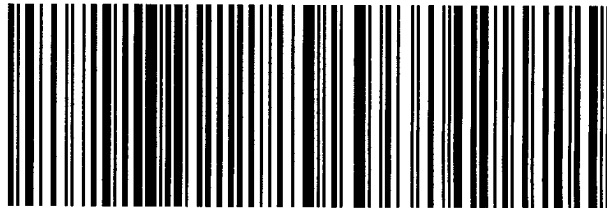
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

Freeport McMoRan Sierrita

FMI-VRP

Work Order Number: 0812210

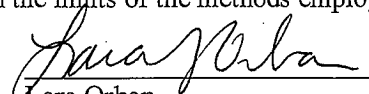
1. This report consists of the analytical results for 14 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/11/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. The duplicate error ratio (DER) for sample 0812210-9 and its duplicate was elevated above our warning limit of 1.42 at 1.88. DER is defined as:

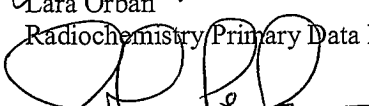
$$DER = \frac{|S - D|}{2 * \sqrt{\sigma_s^2 + \sigma_D^2}}$$

Where: S = sample result, D = duplicate result, σ_s = 1 sigma uncertainty of sample result, and σ_D = 1 sigma uncertainty of the duplicate result. Results are acceptable according to SOP715R15.

5. No further anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer


Radiochemistry Final Data Reviewer

3/12/09
Date

03/13/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812210

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-04-5-7	0812210-1		SOIL	05-Aug-08	9:34
EM-U25-1-3	0812210-10		SOIL	06-Aug-08	10:59
EM-U25-5-5.5	0812210-11		SOIL	06-Aug-08	11:03
EM-N29-1-3	0812210-12		SOIL	06-Aug-08	13:09
RA-SD-02-1.5-3.0	0812210-16		SOIL	11-Aug-08	9:30
EM-N29-0-1	0812210-17		SOIL	06-Aug-08	13:09
EM-X26-5-7	0812210-18		SOIL	06-Aug-08	10:06
EM-G27-0-1	0812210-19		SOIL	07-Aug-08	8:18
C-JS-04-10-12	0812210-2		SOIL	05-Aug-08	9:42
EM-G27-1-3	0812210-20		SOIL	07-Aug-08	8:18
C-JS-04-15-16	0812210-3		SOIL	05-Aug-08	10:33
CS-JS-04-0-1	0812210-4		SOIL	06-Aug-08	9:02
CS-JS-04-1-3	0812210-5		SOIL	06-Aug-08	9:02
CS-JS-04-5-7	0812210-6		SOIL	06-Aug-08	9:10
EM-X26-0-1	0812210-7		SOIL	06-Aug-08	10:00
EM-X26-1-3	0812210-8		SOIL	06-Aug-08	10:00
EM-U25-0-1	0812210-9		SOIL	06-Aug-08	10:59



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812210

Date: 12-19-08

Page 1 of 2

Project Name/No.: Fml-v RP Sampler(s): K. Wadsworth Turnaround (circle one): Standard or Rush (Due) Disposer Date 60 day or Return to Client

Report To: Steven Vaughan

Phone: (520) 407-2843

Fax:

E-mail: Steven_Vaughan@urcorp.com

Company: Freeport McMoran

Address: 6200 W Duval Mine Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Maximum Isotopes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: Order No. 0508VT

Trk# 797192613046

Relinquished By: (1) Signature: Kevin Wadsworth Printed Name: Kevin Wadsworth Date: 12-19-08 Time: 1600 Company: URS

Relinquished By: (2) Signature: Received By: Signature: Printed Name: Date: Time: Company:

Relinquished By: (1) Signature: Received By: Signature: Printed Name: Date: Time: Company: ALS Paragon

Form 2026.xls (6/16/06)

Form 202r6.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812210Project Manager: JmeInitials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> +
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source: note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4 <u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #15 (RA-SD-02-0-1.5MS) Sample ID on label RA-SD-01-0-1.5MS.
 • One 16 oz WRG received for all samples Filled 20% - 90%.
 + Samples #10 and 9 (EM-025-1-3 and EM-025-0-1) received with broken lids, lids replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton. SN 29922500201-0066

*IR Gun #4: Oakton. SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111208/28/03

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.0

Delivery Address Bar Code

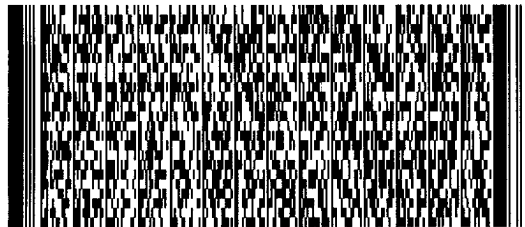


Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

081221c

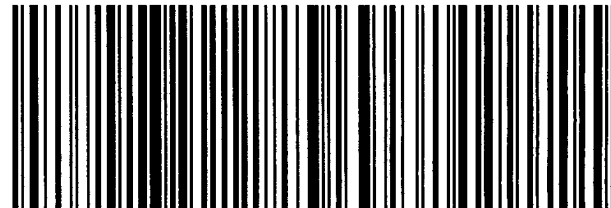


3 of 5
 MPS# 7971 9861 3846
 0263
 Mstr# 7971 9861 3710 0201

MON - 22DEC AA
STANDARD OVERNIGHT

XH FTCA

80524
CO-US
DEN



After printing this label:

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2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-2MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.17 +/- 0.30	0.61	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812210-1

Date Printed: Thursday, March 12, 2009

ALS Paragon
LIMS Version: 6.250A

Page 1 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-3MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0 +/- 0.14	0.20	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812210-1

Date Printed: Thursday, March 12, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-2

QCBatchID: RE090220-2-1

Run ID: RE090220-2A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	35.5 +/- 6.63	0.547	43.2	82.2	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812210-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	36.6 +/- 6.86	0.426	43.3	84.6	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812210-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-0-1
Lab ID: 0812210-9DUP

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	0.67 +/- 0.31	2.2 +/- 0.76	1.88	2.13	W

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
DER - Duplicate Error Ratio (see PAI SOP 715)
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	C-JS-04-5-7
Lab ID:	0812210-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.62	0.55	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-10-12	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.09 g
Lab ID: 0812210-2	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 05-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.1 +/- 1.0	0.86	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-04-0-1
Lab ID:	0812210-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.89 +/- 0.55	0.75	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-04-1-3
Lab ID:	0812210-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.56	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-04-5-7
Lab ID:	0812210-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.51	0.31	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-X26-0-1	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.05 g
Lab ID: 0812210-7	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.5 +/- 0.91	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-X26-1-3	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.02 g
Lab ID: 0812210-8	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.72 +/- 0.47	0.63	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-U25-0-1
Lab ID:	0812210-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.67 +/- 0.31	0.30	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-0-1

Lab ID: 0812210-9DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 06-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.76	0.53	1	W

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-U25-1-3
Lab ID:	0812210-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.52	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-N29-1-3
Lab ID:	0812210-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.58	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-N29-0-1	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.06 g
Lab ID: 0812210-17	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.79 +/- 0.34	0.32	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-X26-5-7
Lab ID:	0812210-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.38	0.072	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-G27-0-1
Lab ID:	0812210-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.83	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-G27-1-3	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.07 g
Lab ID: 0812210-20	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.69	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

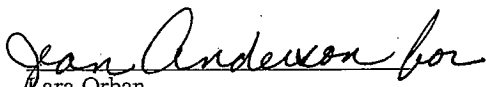
Freeport McMoRan Sierrita

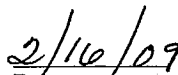
FMI-VRP

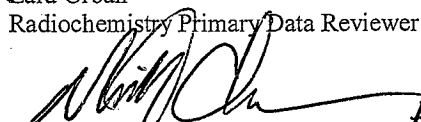
Work Order Number: 0812210

1. This report consists of the analytical results for one soil sample received by ALS Paragon on 12/20/08.
2. This sample was prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in this sample.
3. The sample was analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analysis was completed on 01/29/09.
4. The analysis results for this sample are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil sample from this work order was initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. No further anomalous situations were noted during the preparation and analysis of this sample. All quality control criteria were met.


The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer


2/16/09
Date


Radiochemistry Final Data Reviewer

FOR
JOHN


02/16/09
Date

PETRONIC

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812210

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-04-5-7	0812210-1		SOIL	05-Aug-08	9:34
C-JS-04-10-12	0812210-2		SOIL	05-Aug-08	9:42
C-JS-04-15-16	0812210-3		SOIL	05-Aug-08	10:33
CS-JS-04-0-1	0812210-4		SOIL	06-Aug-08	9:02
CS-JS-04-1-3	0812210-5		SOIL	06-Aug-08	9:02
CS-JS-04-5-7	0812210-6		SOIL	06-Aug-08	9:10
EM-X26-0-1	0812210-7		SOIL	06-Aug-08	10:00
EM-X26-1-3	0812210-8		SOIL	06-Aug-08	10:00
EM-U25-0-1	0812210-9		SOIL	06-Aug-08	10:59
EM-U25-1-3	0812210-10		SOIL	06-Aug-08	10:59
EM-U25-5-5.5	0812210-11		SOIL	06-Aug-08	11:03
EM-N29-1-3	0812210-12		SOIL	06-Aug-08	13:09
RA-SD-02-1.5-3.0	0812210-16		SOIL	11-Aug-08	9:30
EM-N29-0-1	0812210-17		SOIL	06-Aug-08	13:09
EM-X26-5-7	0812210-18		SOIL	06-Aug-08	10:06
EM-G27-0-1	0812210-19		SOIL	07-Aug-08	8:18
EM-G27-1-3	0812210-20		SOIL	07-Aug-08	8:18



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812210

Date: 12-19-08

Page 1 of 2

Project Name/No.: Fml-v RP Sampler(s): K. Wadsworth Turnaround (circle one): Standard or Rush (Due) Disposer Date 60 day or Return to Client

Report To: Steven Vaughan

Phone: (520) 407-2843

Fax:

E-mail: Steven_Vaughan@urcorp.com

Company: Freeport McMoran

Address: 6200 W Duval Mine Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Matrix	Preservative	No. of Containers	VOCs	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP/MS	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total Radiosr)	Gamma Isotopes	Radon 222	Maximum Isotopes 234, 235, 238
C-35-04-5-7	8/5/08	934	5	n/a	1																												
C-35-04-10-12	8/5/08	942	5	n/a	1																												
C-35-04-15-16	8/5/08	1033	5	n/a	1																												
C-35-04-0-1	8/6/08	902	5	n/a	1																												
C-35-04-1-3	8/6/08	902	5	n/a	1																												
C-35-04-5-7	8/6/08	910	5	n/a	1																												
EM-X26-0-1	8/6/08	1000	5	n/a	1																												
EM-X26-1-3	8/6/08	1000	5	n/a	1																												
EM-U25-0-1	8/6/08	1059	5	n/a	1																												
EM-U25-1-3	8/6/08	1059	5	n/a	1																												

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: Order No. 0508VT

Trk# 797192613046

Relinquished By: (1) Signature: Kevin Wadsworth Printed Name: Kevin Wadsworth Date: 12-19-08 Time: 1600 Company: URS

Relinquished By: (2) Signature: Received By: (1) Signature: Received By: (2) Signature: Printed Name: Printed Name: Date: Date: Time: Time: Company: Company



y

800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Page 2 of 2

1) Disposer Date 60 day or Return to Client

E-mail: Steven-Vaughan@vpsc.org.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type..., HCl, etc.)	No. of Containers
EM-U25-S-55	8/6/08	1103	11	S	n/a	1
EM-N24-1-3	8/6/08	1309	12	S	n/a	1
RA-SD-C2-C-15 ^{WSD}	8/11/08	910	13	S	n/a	1
RA-SD-C2-15-30 ^{WSD}	8/11/08	930	14	S	n/a	1
RA-SD-C2-C-15 ^{WSD}	8/11/08	950	15	S	n/a	1
RA-SD-C2-15-30	8/11/08	930	16	S	n/a	1
EM-N24-0-1	8/6/08	1309	17	S	n/a	1
EM-X26-5-7	8/6/08	1006	18	S	n/a	1
EM-G27-0-1	8/7/08	818	19	S	n/a	1
EM-G27-1-3	8/7/08	818	20	S	n/a	1

*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil
Comments:

Trk # 7971 9861 3846

Received By: Anna Jordan
Signature: [Signature]
Printed Name: Anna Jordan
Date: 12/20/08 Time: 1000
Company: ATS Paragon

Received By: _____
Signature _____
Printed Name _____
Date _____ Time _____
Company _____

Form 202r6.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812210Project Manager: JmeInitials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> +
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source: note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4 <u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #15 (RA-SD-02-0-1.5MS) Sample ID on label RA-SD-01-0-1.5MS.
 • One 16 oz WRG received for all samples Filled 20% - 90%.
 + Samples #10 and 9 (EM-025-1-3 and EM-025-0-1) received with broken lids, lids replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton. SN 29922500201-0066

*IR Gun #4: Oakton. SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111208/28/03

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.0

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

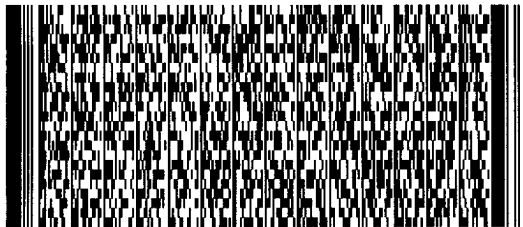
SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

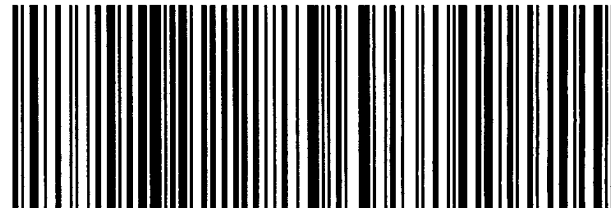
081221c

3 of 5
 MPS# 7971 9861 3846
 0263
 Mstr# 7971 9861 3710 0201

MON - 22DEC AA
STANDARD OVERNIGHT

**XH FTCA**

80524
CO-US
DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812210-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812210-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-X26-1-3
Lab ID:	0812210-8

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 06-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.501 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 1.4	2.5	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35900	32500	ug	90.4	40 - 110 %	
YTTRIUM	8713	5770	ug	66.3	40 - 110 %	
Total				59.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812210-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812210

1. This report consists of the analytical results for 17 soil samples received by ALS Paragon on 12/20/2008.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to potential matrix interference, the samples were prepared at a reduced aliquot of ~1 gram. A further reduced aliquot of ~0.5 gram was taken for sample 0812210-6 due to high activity seen in prescreen.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 02/21/2009.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. The requested MDC of 0.1 pCi/g was not met for U-234 for sample 0812210-18. The reported activity for this sample is greater than the achieved MDC. This sample is identified with an "M3" flag on the final reports.
7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jean Anderson

Jean Anderson

Radiochemistry Primary Data Reviewer

2/27/09

Date

[Signature]

Radiochemistry Final Data Reviewer

02/27/09

Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812210

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-04-5-7	0812210-1		SOIL	05-Aug-08	9:34
C-JS-04-10-12	0812210-2		SOIL	05-Aug-08	9:42
C-JS-04-15-16	0812210-3		SOIL	05-Aug-08	10:33
CS-JS-04-0-1	0812210-4		SOIL	06-Aug-08	9:02
CS-JS-04-1-3	0812210-5		SOIL	06-Aug-08	9:02
CS-JS-04-5-7	0812210-6		SOIL	06-Aug-08	9:10
EM-X26-0-1	0812210-7		SOIL	06-Aug-08	10:00
EM-X26-1-3	0812210-8		SOIL	06-Aug-08	10:00
EM-U25-0-1	0812210-9		SOIL	06-Aug-08	10:59
EM-U25-1-3	0812210-10		SOIL	06-Aug-08	10:59
EM-U25-5-5.5	0812210-11		SOIL	06-Aug-08	11:03
EM-N29-1-3	0812210-12		SOIL	06-Aug-08	13:09
RA-SD-02-1.5-3.0	0812210-16		SOIL	11-Aug-08	9:30
EM-N29-0-1	0812210-17		SOIL	06-Aug-08	13:09
EM-X26-5-7	0812210-18		SOIL	06-Aug-08	10:06
EM-G27-0-1	0812210-19		SOIL	07-Aug-08	8:18
EM-G27-1-3	0812210-20		SOIL	07-Aug-08	8:18



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812210

Date: 12-19-08

Page 1 of 2

Project Name/No.: Fml-v RP Sampler(s): K. Wadsworth Turnaround (circle one): Standard or Rush (Due) Disposer Date 60 day or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2843

Fax:

E-mail: Steven_Vaughn@urcorp.com

Company: Freeport McMoran

Address: 6200 W Duval Mine Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Matrix	Preservative	No. of Containers	VOCs	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total Radiosr)	Gamma Isotopes	Radon 222	Maximum Isotopes 234, 235, 238
C-35-04-5-7	8/5/08	934	5	n/a	1																												
C-35-04-10-12	8/5/08	942	5	n/a	1																												
C-35-04-15-16	8/5/08	1033	5	n/a	1																												
C-35-04-0-1	8/6/08	902	5	n/a	1																												
C-35-04-1-3	8/6/08	902	5	n/a	1																												
C-35-04-5-7	8/6/08	910	5	n/a	1																												
EM-X26-0-1	8/6/08	1000	5	n/a	1																												
EM-X26-1-3	8/6/08	1000	5	n/a	1																												
EM-U25-0-1	8/6/08	1059	5	n/a	1																												
EM-U25-1-3	8/6/08	1059	5	n/a	1																												

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: Order No. 0508VT

Relinquished By: (1) Signature: Kevin Wadsworth Printed Name: Kevin Wadsworth Date: 12-19-08 Time: 1600 Company: URS

Relinquished By: (2) Signature: Received By: (1) Signature: Received By: (2) Signature: Printed Name: Printed Name: Date: Date: Time: Time: Company: Company

Form 2026.xls (6/16/06)



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812210

Date: 12-19-08

Page 2 of 2

Project Name/No.: <u>FM-1-1-2P</u>		Sampler(s): <u>K Walsh</u>		Turnaround (circle one): <u>Standard</u> or Rush (Due _____)		Disposer Date <u>60 day</u> or Return to Client _____																											
Report To: <u>Steven Vaughn</u>		E-mail: <u>STEVEN_VAUGHN@VSCORP.COM</u>																															
Phone: <u>(520) 407-2845</u>		Company: <u>Freight Mc Moran</u>																															
Fax: _____		Address: <u>6200 W Doral Wine Rd.</u>																															
		<u>Green Valley, AZ 85614</u>																															
Circle method (right); provide additional information as needed (comments).																																	
Sample ID	Date	Time *	Matrix	Preservative	No. of Containers	VOCS	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics	TCLP Metals	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Minimum Isotopes 234, 235, 238
FM-U25-5-55	8/6/08	1103	5	n/a	1																												
FM-N29-1-3	8/6/08	1309	5	n/a	1																												
RA-SD-02-0-15	8/1/08	910	5	n/a	1																												
RA-SD-02-1-5-30	8/1/08	930	5	n/a	1																												
RA-SD-02-0-1-5M5	8/1/08	950	5	n/a	1																												
RA-SD-02-1-5-3-0	8/1/08	930	5	n/a	1																												
FM-N29-0-1	8/6/08	1309	5	n/a	1																												
FM-X26-5-7	8/6/08	1006	5	n/a	1																												
FM-627-0-1	8/7/08	818	5	n/a	1																												
FM-627-1-3	8/7/08	818	5	n/a	1																												
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter								Relinquished By: (1) Signature <u>K Walsh</u>		Relinquished By: (2) Signature _____																							
Comments: Order No. 054807								Printed Name <u>Kevin Walsh</u>		Printed Name _____																							
								Date <u>12-19-08</u> Time <u>1600</u>		Date _____ Time _____																							
								Company _____		Company _____																							
								Received By: (1) Signature <u>Lara T Jordan</u>		Received By: (2) Signature _____																							
								Printed Name <u>Lara T Jordan</u>		Printed Name _____																							
								Date <u>12/20/08</u> Time <u>1000</u>		Date _____ Time _____																							
								Company <u>ALS Paragon</u>		Company _____																							

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmeWorkorder No: 0812210
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> +
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source: note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4 <u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #15 (RA-SD-02-0-1.5MS) Sample ID on label RA-SD-01-0-1.5MS.
 • One 16 oz WRG received for all samples Filled 20% - 90%.
 + Samples #10 and 9 (GM-025-1-3 and GM-025-0-1) received with broken lids, lids replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton. SN 29922500201-0066

*IR Gun #4: Oakton. SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111208/28/03

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.0

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

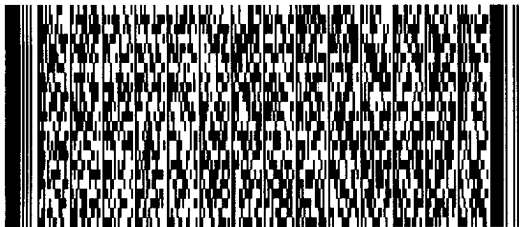
081221c

3 of 5

MON - 22DEC AA
 STANDARD OVERNIGHT

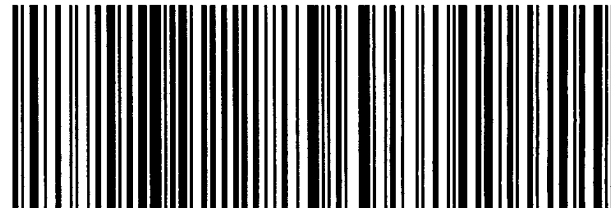
MPS# 7971 9861 3846
 0263

Mstr# 7971 9861 3710 0201



XH FTCA

80524
 CO-US
 DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090218-3MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 18-Feb-09

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Final Aliquot: 0.977 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.011 +/- 0.024	0.035	0.1	U
15117-96-1	U-235	0.0079 +/- 0.029	0.021	0.1	U
7440-61-1	U-238	0.021 +/- 0.028	0.048	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.625	3.73	pCi/g	80.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812210-1

Date Printed: Friday, February 27, 2009

ALS Paragon
LIMS Version: 6.248A

Page 1 of 1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090218-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 18-Feb-09

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Final Aliquot: 0.977 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.65 +/- 0.831	0.0509	4.44	105	82 - 122	P
7440-61-1	U-238	4.67 +/- 0.833	0.0473	4.61	101	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.625	3.98	pCi/g	86.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812210-1

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

Page 1 of 1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-04-15-16
Lab ID:	0812210-3DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.1 +/- 0.41	1.8 +/- 0.35	0.65	2.13	
15117-96-1	U-235	0.087 +/- 0.051	0.060 +/- 0.043	0.41	2.13	LT
7440-61-1	U-238	1.9 +/- 0.37	1.7 +/- 0.34	0.46	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-N29-1-3
Lab ID: 0812210-12DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.2 +/- 0.27	1.2 +/- 0.27	0.02	2.13	
15117-96-1	U-235	0.078 +/- 0.050	0.074 +/- 0.049	0.05	2.13	LT
7440-61-1	U-238	1.3 +/- 0.28	1.1 +/- 0.24	0.52	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-04-5-7
Lab ID:	0812210-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.30	0.038	0.1	
15117-96-1	U-235	0.092 +/- 0.051	0.033	0.1	LT
7440-61-1	U-238	1.6 +/- 0.32	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	4.10	pCi/g	91.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-04-10-12
Lab ID:	0812210-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.0 +/- 0.55	0.034	0.1	
15117-96-1	U-235	0.15 +/- 0.067	0.033	0.1	
7440-61-1	U-238	3.1 +/- 0.56	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	3.99	pCi/g	88.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-04-15-16
Lab ID:	0812210-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.037	0.1	
15117-96-1	U-235	0.087 +/- 0.051	0.036	0.1	LT
7440-61-1	U-238	1.9 +/- 0.37	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.513	3.69	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-15-16

Lab ID: 0812210-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.031	0.1	
15117-96-1	U-235	0.060 +/- 0.043	0.036	0.1	LT
7440-61-1	U-238	1.7 +/- 0.34	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.508	3.73	pCi/g	82.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

Page 1 of 2

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-04-0-1
Lab ID:	0812210-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.027	0.1	
15117-96-1	U-235	0.14 +/- 0.063	0.016	0.1	
7440-61-1	U-238	1.8 +/- 0.35	0.027	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	4.16	pCi/g	92.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-04-1-3
Lab ID:	0812210-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.027	0.1	
15117-96-1	U-235	0.096 +/- 0.051	0.032	0.1	LT
7440-61-1	U-238	1.8 +/- 0.35	0.033	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.483	4.13	pCi/g	92.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-04-5-7
Lab ID:	0812210-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.500 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.35	0.091	0.1	
15117-96-1	U-235	0.088 +/- 0.075	0.087	0.1	LT
7440-61-1	U-238	1.8 +/- 0.41	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.026	7.40	pCi/g	82.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-X26-0-1
Lab ID:	0812210-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.33	0.046	0.1	
15117-96-1	U-235	0.063 +/- 0.044	0.050	0.1	LT
7440-61-1	U-238	1.8 +/- 0.35	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	4.02	pCi/g	89.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-X26-1-3
Lab ID:	0812210-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.85 +/- 0.20	0.061	0.1	
15117-96-1	U-235	0.059 +/- 0.044	0.052	0.1	LT
7440-61-1	U-238	0.90 +/- 0.21	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.505	3.88	pCi/g	86.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-U25-0-1
Lab ID:	0812210-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.40	0.046	0.1	
15117-96-1	U-235	0.13 +/- 0.062	0.019	0.1	
7440-61-1	U-238	2.2 +/- 0.42	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.516	3.94	pCi/g	87.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-U25-1-3
Lab ID:	0812210-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.072	0.1	
15117-96-1	U-235	0.11 +/- 0.065	0.045	0.1	
7440-61-1	U-238	1.8 +/- 0.37	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.12	pCi/g	69.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-U25-5-5.5
Lab ID:	0812210-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	5.4 +/- 1.0	0.070	0.1	
15117-96-1	U-235	0.26 +/- 0.11	0.051	0.1	
7440-61-1	U-238	6.1 +/- 1.1	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.491	2.86	pCi/g	63.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-N29-1-3
Lab ID:	0812210-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.27	0.048	0.1	
15117-96-1	U-235	0.078 +/- 0.050	0.038	0.1	LT
7440-61-1	U-238	1.3 +/- 0.28	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.508	3.72	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-N29-1-3

Lab ID: 0812210-12DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 06-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.27	0.047	0.1	
15117-96-1	U-235	0.074 +/- 0.049	0.045	0.1	LT
7440-61-1	U-238	1.1 +/- 0.24	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.512	3.76	pCi/g	83.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-1.5-3.0
Lab ID:	0812210-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.050	0.1	
15117-96-1	U-235	0.061 +/- 0.044	0.037	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.476	3.87	pCi/g	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-N29-0-1
Lab ID:	0812210-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.084	0.1	
15117-96-1	U-235	0.056 +/- 0.043	0.050	0.1	LT
7440-61-1	U-238	1.4 +/- 0.29	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.514	3.67	pCi/g	81.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-X26-5-7
Lab ID:	0812210-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.49	0.11	0.1	M3
15117-96-1	U-235	0.084 +/- 0.072	0.083	0.1	LT
7440-61-1	U-238	2.2 +/- 0.50	0.087	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.517	2.03	pCi/g	45.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-G27-0-1
Lab ID:	0812210-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.54	0.052	0.1	
15117-96-1	U-235	0.18 +/- 0.078	0.052	0.1	
7440-61-1	U-238	2.7 +/- 0.51	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.509	3.72	pCi/g	82.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-G27-1-3	Sample Matrix: SOIL	Prep Batch: AS090218-3	Final Aliquot: 1.00 g
Lab ID: 0812210-20	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090218-3-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: AS090218-3C	Moisture(%): NA
	Date Prepared: 18-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 21-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.043	0.1	
15117-96-1	U-235	0.074 +/- 0.049	0.045	0.1	LT
7440-61-1	U-238	1.7 +/- 0.34	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	3.83	pCi/g	85.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**


Work Order Number: 0812210

1. The following report consists of analytical results and supporting documentation for 16 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812210-3, -11, and -16 were sealed in steel cans on 01/02/09 and 12/30/08, respectively, and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/23/09 and 01/20/09 is at least 97.78%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.89%.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/26/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volume was insufficient to allow preparation of a duplicate in batch GS090106-5. Duplicate analysis of sample 0812210-1 was performed in lieu of a prepared duplicate.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples. This is applicable for samples 0812210-3, -11, and -16.
7. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium. This is applicable for samples 0812210-3, -11, and -16.




8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. The requested detection limit of 1.0 pCi/gram for ^{228}Ra was not met for many of the samples associated with this work order. The reported activities are greater than the achieved detection limits. The results have been flagged with a "M3" qualifier on the final reports. The results are submitted without further qualification.
11. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer

02/16/09
Date


Radiochemistry Final Data Reviewer

2-16-09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812210

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-04-5-7	0812210-1		SOIL	05-Aug-08	9:34
C-JS-04-10-12	0812210-2		SOIL	05-Aug-08	9:42
C-JS-04-15-16	0812210-3		SOIL	05-Aug-08	10:33
CS-JS-04-0-1	0812210-4		SOIL	06-Aug-08	9:02
CS-JS-04-1-3	0812210-5		SOIL	06-Aug-08	9:02
CS-JS-04-5-7	0812210-6		SOIL	06-Aug-08	9:10
EM-X26-0-1	0812210-7		SOIL	06-Aug-08	10:00
EM-X26-1-3	0812210-8		SOIL	06-Aug-08	10:00
EM-U25-0-1	0812210-9		SOIL	06-Aug-08	10:59
EM-U25-1-3	0812210-10		SOIL	06-Aug-08	10:59
EM-U25-5-5.5	0812210-11		SOIL	06-Aug-08	11:03
EM-N29-1-3	0812210-12		SOIL	06-Aug-08	13:09
RA-SD-02-1.5-3.0	0812210-16		SOIL	11-Aug-08	9:30
EM-N29-0-1	0812210-17		SOIL	06-Aug-08	13:09
EM-X26-5-7	0812210-18		SOIL	06-Aug-08	10:06
EM-G27-0-1	0812210-19		SOIL	07-Aug-08	8:18
EM-G27-1-3	0812210-20		SOIL	07-Aug-08	8:18



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812210

Date: 12-19-08

Page 1 of 2

Project Name/No.: Fml-v RP Sampler(s): K. Wadsworth Turnaround (circle one): Standard or Rush (Due) Disposer Date 60 day or Return to Client

Report To: Steven Vaughan

Phone: (520) 407-2843

Fax:

E-mail: Steven_Vaughan@urcorp.com

Company: Freeport McMoran

Address: 6200 W Duval Mine Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadiSr)	Gamma Isotopes	Radon 222	Maximum Isotopes	
C-35-04-5-7	8/5/08	934	1	S	n/a	1																														
C-35-04-10-12	8/5/08	942	2	S	n/a	1																														
C-35-04-15-16	8/5/08	1033	3	S	n/a	1																														
C-35-04-0-1	8/6/08	902	4	S	n/a	1																														
C-35-04-1-3	8/6/08	902	5	S	n/a	1																														
C-35-04-5-7	8/6/08	910	6	S	n/a	1																														
EM-X26-0-1	8/6/08	1000	7	S	n/a	1																														
EM-X26-1-3	8/6/08	1000	8	S	n/a	1																														
EM-U25-0-1	8/6/08	1059	9	S	n/a	1																														
EM-U25-1-3	8/6/08	1059	10	S	n/a	1																														

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: Order No. 0508VT

Trk# 797192613046

Relinquished By: (1) Signature: Kevin Wadsworth Printed Name: Kevin Wadsworth Date: 12-19-08 Time: 1600 Company: URS

Relinquished By: (2) Signature: Received By: (1) Signature: Received By: (2) Signature: Printed Name: Printed Name: Date: Date: Time: Time: Company: Company

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812210Project Manager: JmeInitials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> +
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source: note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4 <u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #15 (RA-SD-02-0-1.5MS) Sample ID on label RA-SD-01-0-1.5MS.
 • One 16 oz WRG received for all samples Filled 20% - 90%.
 + Samples #10 and 9 (GM-025-1-3 and GM-025-0-1) received with broken lids, lids replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton. SN 29922500201-0066

*IR Gun #4: Oakton. SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111208/28/03

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

14.0

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

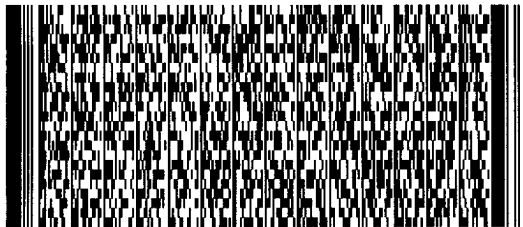
SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

081221c

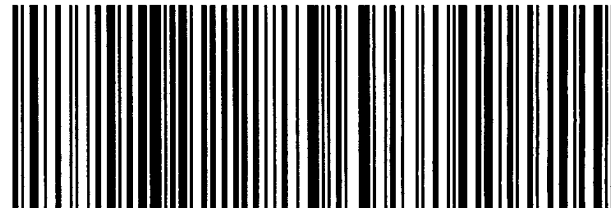
3 of 5
 MPS# 7971 9861 3846
 0263
 Mstr# 7971 9861 3710 0201

MON - 22DEC AA
STANDARD OVERNIGHT



XH FTCA

80524
CO-US
DEN



After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.048 +/- 0.21	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-5MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Final Aliquot: 88.9 g

Result Units: pCi/g

File Name: 090144d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.20 +/- 0.37	0.65	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.14 +/- 0.40	0.83	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6MB

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 191 g

Result Units: pCi/g

File Name: 090107d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.0088 +/- 0.18	0.34	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 191 g

Result Units: pCi/g

File Name: 090107d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.16 +/- 0.32	0.57	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-5LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090099d07

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1090 +/- 128	13.9	986	110	85 - 115	P
10198-40-0	Co-60	478 +/- 56.0	4.39	456	105	85 - 115	P
10045-97-3	Cs-137	406 +/- 47.7	2.63	374	109	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812210-1

Date Printed: Saturday, February 14, 2009

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LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090122d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	452 +/- 53.0	2.54	470	96.2	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090076d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	467 +/- 55.3	7.35	462	101	85 - 115	P
10198-40-0	Co-60	208 +/- 24.4	0.792	214	97.3	85 - 115	P
10045-97-3	Cs-137	181 +/- 21.3	1.18	175	103	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812210-1

Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6ALCS

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090111d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	449 +/- 52.6	2.50	470	95.5	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090112d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	475 +/- 56.3	7.11	462	103	85 - 115	P
10198-40-0	Co-60	209 +/- 24.6	0.818	213	98.0	85 - 115	P
10045-97-3	Cs-137	183 +/- 21.6	1.18	175	105	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812210-1

Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0

Lab ID: 0812210-16DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 183 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d03A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.2 +/- 0.42	1.7 +/- 0.37	0.93	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-5-7

Lab ID: 0812210-1DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 95.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090093d07

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.4 +/- 0.64	2.1 +/- 0.61	0.32	2.13	M3

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0

Lab ID: 0812210-16DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 183 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d03

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.6 +/- 0.59	1.7 +/- 0.60	0.23	2.13	TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-5-7

Lab ID: 0812210-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 95.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090135d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.64	0.73	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-5-7

Lab ID: 0812210-1DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 95.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090093d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.61	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-10-12

Lab ID: 0812210-2

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090137d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.77	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-15-16

Lab ID: 0812210-3

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 195 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090100d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.32	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-15-16

Lab ID: 0812210-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 195 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090100d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.53	0.84	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-04-0-1

Lab ID: 0812210-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 95.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090138d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.65	0.82	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-04-1-3

Lab ID: 0812210-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 91.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090139d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.71	0.81	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-04-5-7

Lab ID: 0812210-6

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090094d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.62	1.2	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-X26-0-1

Lab ID: 0812210-7

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090140d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.67	0.94	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-0-1

Lab ID: 0812210-9

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 88.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090095d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.70	0.92	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-1-3

Lab ID: 0812210-10

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 82.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090141d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.69	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-5-5.5

Lab ID: 0812210-11

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090152d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.1 +/- 0.74	0.63	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-5-5.5

Lab ID: 0812210-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090152d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 0.78	1.3	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-N29-1-3

Lab ID: 0812210-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 86.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090096d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.75	1.4	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-1.5-3.0
Lab ID:	0812210-16

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090120d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.42	0.51	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-1.5-3.0
Lab ID:	0812210-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090120d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.59	1.1	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0

Lab ID: 0812210-16DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 183 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.37	0.57	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0

Lab ID: 0812210-16DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 183 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.60	0.81	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-N29-0-1

Lab ID: 0812210-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 98.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090142d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.48	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-X26-5-7

Lab ID: 0812210-18

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 92.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090097d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.69	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-G27-0-1

Lab ID: 0812210-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 88.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090143d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.77	0.95	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-G27-1-3

Lab ID: 0812210-20

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 84.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090098d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.90	1.6	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1



March 12, 2009

Mr. Aaron Hilshorst
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-211
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Hilshorst:

Nineteen soil samples were received from Freeport McMoRan Sierrita on December 20, 2008. The samples were scheduled for the following analyses.

Isotopic Uranium	pages 1-32
Gamma Spectroscopy	pages 1-45
Radium-228 by Method 9320	pages 1-9

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/eh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812211

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-03-5-7	0812211-1		SOIL	04-Aug-08	10:34
C-JS-03-10-12	0812211-2		SOIL	04-Aug-08	10:43
C-JS-03-15-17	0812211-3		SOIL	04-Aug-08	11:03
CS-JS-01-1-3	0812211-4		SOIL	04-Aug-08	11:38
CS-JS-01-5-7	0812211-5		SOIL	04-Aug-08	11:44
EM-H22-5-7	0812211-6		SOIL	31-Jul-08	11:55
EM-K24-0-1	0812211-7		SOIL	31-Jul-08	13:40
EM-K24-1-3	0812211-8		SOIL	31-Jul-08	13:40
EM-K24-5-7	0812211-9		SOIL	31-Jul-08	13:58
CS-JS-01-10-12	0812211-10		SOIL	04-Aug-08	13:30
CS-JS-02-0-1	0812211-11		SOIL	04-Aug-08	14:06
CS-JS-02-1-3	0812211-12		SOIL	04-Aug-08	14:06
CS-JS-02-5-7	0812211-13		SOIL	04-Aug-08	14:15
CS-JS-03-0-1	0812211-14		SOIL	05-Aug-08	8:13
CS-JS-03-1-3	0812211-15		SOIL	05-Aug-08	8:13
CS-JS-03-5-7	0812211-16		SOIL	05-Aug-08	8:19
CS-JS-03-10-12	0812211-17		SOIL	05-Aug-08	8:28
C-JS-04-0-1	0812211-18		SOIL	05-Aug-08	9:25
C-JS-04-1-3	0812211-19		SOIL	05-Aug-08	9:25



PARAGON
ANALYTICALS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID

0812211

Date:

Page 2 of 2

Project Name/No.: FMI-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: Date today or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: steven.vaughn@cursorp.com

Company: Freeport McMoran

Address: 6200 W Duval Mine Rd

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes	
C-35-02-0-1	8/4/08	1406	11	S	N/A	1																														
C-35-02-1-3	8/4/08	1406	12	S	N/A	1																														
C-35-02-5-7	8/4/08	1415	13	S	N/A	1																														
C-35-03-0-1	8/5/08	813	14	S	N/A	1																														
C-35-03-1-3	8/5/08	813	15	S	N/A	1																														
C-35-03-5-7	8/5/08	819	16	S	N/A	1																														
C-35-03-10-12	8/5/08	828	17	S	N/A	1																														
C-35-04-0-1	8/5/08	925	18	S	N/A	1																														
C-35-04-1-3	8/5/08	925	19	S	N/A	1																														

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments:

Order No. 0368VT

Tck # 797198613710

(1) Relinquished By:	(2) Relinquished By:
Signature _____	Signature _____
Printed Name _____	Printed Name _____
Date 12-17-08 Time 1600	Date _____ Time _____
Company URS	Company _____
(1) Received By:	(2) Received By:
Signature _____	Signature _____
Printed Name _____	Printed Name _____
Date 12/20/08 Time 1000	Date _____ Time _____
Company ALS Paragon	Company _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812Z11Project Manager: JmcInitials: LJODate: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample # 12 (CS-JS-02-1-3) Sample ID on label CS-JS-01-1-3. - Date & Time matched
 * All samples only one 16 oz WMG received Filled 25% - 100%. used COC ID
 + Samples #1 and 5 (CS-JS-03-5-7 and CS-JS-01-5-7) were received with broken lids. Lids were replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pmProject Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/28/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

C812211

1 of 5

MON - 22DEC AA

TRK# 7971 9861 3710
 0201

STANDARD OVERNIGHT

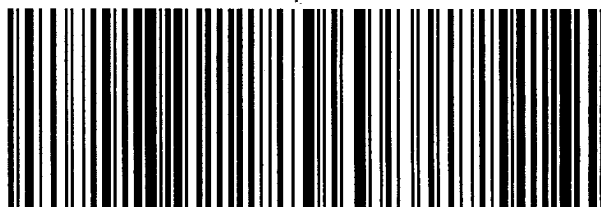
MASTER

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

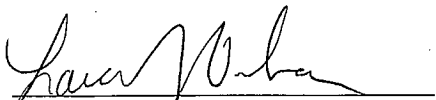
Freeport McMoRan Sierrita

FMI-VRP

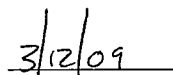
Work Order Number: 0812211

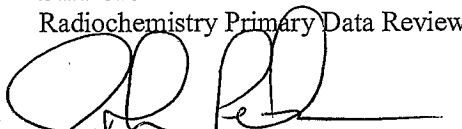
1. This report consists of the analytical results for eleven soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/11/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. The radiometric recovery for the matrix spike of sample 0812211-4 is below the lower control limit of 57% at 52.2%. All other quality control criteria have been met. ALS Paragon does not control on matrix spike recovery. The result for this sample is considered an estimated value and is included in this data package.
5. No further anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

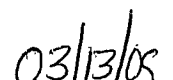


Lara Orban
Radiochemistry Primary Data Reviewer


3/12/09
Date



Radiochemistry Final Data Reviewer


03/13/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812211

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-03-5-7	0812211-1		SOIL	04-Aug-08	10:34
CS-JS-01-10-12	0812211-10		SOIL	04-Aug-08	13:30
CS-JS-02-0-1	0812211-11		SOIL	04-Aug-08	14:06
CS-JS-02-1-3	0812211-12		SOIL	04-Aug-08	14:06
CS-JS-02-5-7	0812211-13		SOIL	04-Aug-08	14:15
CS-JS-03-0-1	0812211-14		SOIL	05-Aug-08	8:13
CS-JS-03-1-3	0812211-15		SOIL	05-Aug-08	8:13
CS-JS-03-5-7	0812211-16		SOIL	05-Aug-08	8:19
CS-JS-03-10-12	0812211-17		SOIL	05-Aug-08	8:28
C-JS-04-0-1	0812211-18		SOIL	05-Aug-08	9:25
C-JS-04-1-3	0812211-19		SOIL	05-Aug-08	9:25
C-JS-03-10-12	0812211-2		SOIL	04-Aug-08	10:43
C-JS-03-15-17	0812211-3		SOIL	04-Aug-08	11:03
CS-JS-01-1-3	0812211-4		SOIL	04-Aug-08	11:38
CS-JS-01-5-7	0812211-5		SOIL	04-Aug-08	11:44
EM-H22-5-7	0812211-6		SOIL	31-Jul-08	11:55
EM-K24-0-1	0812211-7		SOIL	31-Jul-08	13:40
EM-K24-1-3	0812211-8		SOIL	31-Jul-08	13:40
EM-K24-5-7	0812211-9		SOIL	31-Jul-08	13:58



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ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812211

Date:

Page 1 of 2

Project Name/No.: FM1-VLP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: Steven.Vaughn@uscorp.com
Company: Freemont McMurran
Address: 62000 Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers
C-JS-03-5-7	8/4/08	1034	1	S	n/a	1
C-JS-03-10-12	8/4/08	1043	2	S	n/a	1
C-JS-03-15-17	8/4/08	1103	3	S	n/a	1
C-JS-01-1-3	8/4/08	1138	4	S	n/a	1
C-JS-01-5-7	8/4/08	1144	5	S	n/a	1
EM-H22-5-7	7/31/08	1155	6	S	n/a	1
EM-K24-0-1	7/31/08	1340	7	S	n/a	1
EM-K24-1-3	7/31/08	1340	8	S	n/a	1
EM-K24-5-7	7/31/08	1358	9	S	n/a	1
C5-JS-01-10-12	8/4/08	1330	10	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Relinquished By: (1)	Relinquished By: (2)
Signature <u>K. Walsh</u>	Signature <u> </u>
Printed Name <u>K. Walsh</u>	Printed Name <u> </u>
Date <u>12-17-08</u>	Date <u> </u>
Time <u>1600</u>	Time <u> </u>
Company <u>ALS</u>	Company <u> </u>
Received By: (1)	Received By: (2)
Signature <u>Lara J. Orban</u>	Signature <u> </u>
Printed Name <u>Lara J. Orban</u>	Printed Name <u> </u>
Date <u>12/20/08</u>	Date <u> </u>
Time <u>1000</u>	Time <u> </u>
Company <u>ALS Paragon</u>	Company <u> </u>

Order No. 054807

Trk # 17971 98613710



ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812211

Date:

Page 2 of 2

Project Name/No.: EMI-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due today) Dispose: today or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: steven.vaughn@arscorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes		
C-35-02-0-1	8/4/08	1406	11	S	N/A	1																															
C-35-02-1-3	8/4/08	1406	12	S	N/A	1																															
C-35-02-5-7	8/4/08	1415	13	S	N/A	1																															
C-35-03-0-1	8/5/08	813	14	S	N/A	1																															
C-35-03-1-3	8/5/08	813	15	S	N/A	1																															
C-35-03-5-7	8/5/08	819	16	S	N/A	1																															
C-35-03-10-12	8/5/08	828	17	S	N/A	1																															
C-35-04-0-1	8/5/08	925	18	S	N/A	1																															
C-35-04-1-3	8/5/08	925	19	S	N/A	1																															

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Relinquished By: K. Walsh

Signature

Printed Name Kevin Walsh

Date 12-17-08 Time 1600

Company URS

Relinquished By: Anna J. Orban

Signature

Printed Name Anna J. Orban

Date 12/20/08 Time 1000

Company ALS Paragon

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812211Project Manager: JmcInitials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #12 (CS-JS-02-1-3) Sample ID on label CS-JS-01-1-3. - Date & Time matched used COC ID

• All samples only one 16 oz WMG received Filled 25% - 100%.

+ Samples #1 and 5 (C-JS-03-5-7 and CS-JS-01-5-7) were received with broken lids. Lids were replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pmProject Manager Signature / Date: Jmc 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

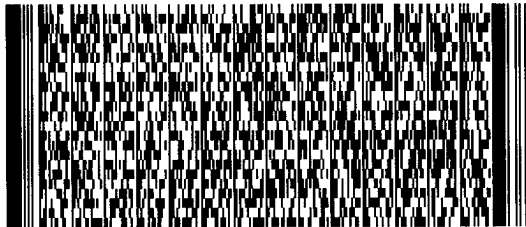
Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

C812211

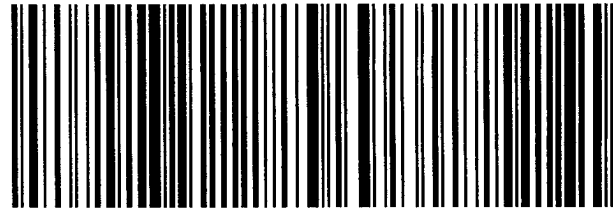


1 of 5
 TRK# 7971 9861 3710
 0201
 ## MASTER ##

MON - 22DEC AA
STANDARD OVERNIGHT

XH FTCA

80524
CO-US
DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-3MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0 +/- 0.14	0.20	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812211-1

Date Printed: Thursday, March 12, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-4MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.12 +/- 0.20	0.42	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812211-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	36.6 +/- 6.86	0.426	43.3	84.6	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812211-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-4LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	44.3 +/- 8.18	0.223	42.8	104	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812211-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-1-3

Lab ID: 0812211-4MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	24.2	1.8	0.261	43.0	52.2	57 - 126	N

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812211-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-0-1
Lab ID: 0812211-14DUP

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.3 +/- 0.65	2.8 +/- 0.78	0.53	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-03-5-7	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.02 g
Lab ID: 0812211-1	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 04-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.65	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-01-1-3
Lab ID:	0812211-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.53	0.28	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-01-5-7	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.05 g
Lab ID: 0812211-5	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 04-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.6 +/- 0.92	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-01-10-12
Lab ID:	0812211-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.64	0.61	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-0-1
Lab ID:	0812211-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.62	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-1-3
Lab ID:	0812211-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.60	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-03-0-1
Lab ID:	0812211-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.65	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-0-1

Lab ID: 0812211-14DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.78	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-03-1-3
Lab ID:	0812211-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.92 +/- 0.54	0.76	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-03-5-7
Lab ID:	0812211-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.69	0.67	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-0-1	Sample Matrix: SOIL	Prep Batch: RE090220-4	Final Aliquot: 1.09 g
Lab ID: 0812211-18	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-4-1	Prep Basis: Dry Weight
	Date Collected: 05-Aug-08	Run ID: RE090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 04-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.82 +/- 0.33	0.18	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-1-3	Sample Matrix: SOIL	Prep Batch: RE090220-4	Final Aliquot: 1.04 g
Lab ID: 0812211-19	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-4-1	Prep Basis: Dry Weight
	Date Collected: 05-Aug-08	Run ID: RE090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 04-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.85	0.53	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

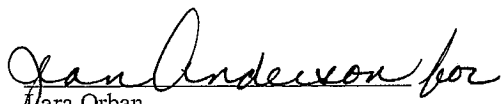
Freeport McMoRan Sierrita

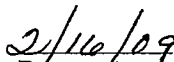
FMI-VRP

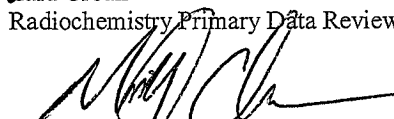
Work Order Number: 0812211

1. This report consists of the analytical results for one soil sample received by ALS Paragon on 12/20/08.
2. This sample was prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in this sample.
3. The sample was analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analysis was completed on 01/29/09.
4. The analysis results for this sample are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil sample from this work order was initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. No further anomalous situations were noted during the preparation and analysis of this sample. All quality control criteria were met.


The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Dara Orban
Radiochemistry Primary Data Reviewer


Date 2/16/09


Radiochemistry Final Data Reviewer

FOR
JOHN
PETROVIC


Date 02/16/09

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812211

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-03-5-7	0812211-1		SOIL	04-Aug-08	10:34
C-JS-03-10-12	0812211-2		SOIL	04-Aug-08	10:43
C-JS-03-15-17	0812211-3		SOIL	04-Aug-08	11:03
CS-JS-01-1-3	0812211-4		SOIL	04-Aug-08	11:38
CS-JS-01-5-7	0812211-5		SOIL	04-Aug-08	11:44
EM-H22-5-7	0812211-6		SOIL	31-Jul-08	11:55
EM-K24-0-1	0812211-7		SOIL	31-Jul-08	13:40
EM-K24-1-3	0812211-8		SOIL	31-Jul-08	13:40
EM-K24-5-7	0812211-9		SOIL	31-Jul-08	13:58
CS-JS-01-10-12	0812211-10		SOIL	04-Aug-08	13:30
CS-JS-02-0-1	0812211-11		SOIL	04-Aug-08	14:06
CS-JS-02-1-3	0812211-12		SOIL	04-Aug-08	14:06
CS-JS-02-5-7	0812211-13		SOIL	04-Aug-08	14:15
CS-JS-03-0-1	0812211-14		SOIL	05-Aug-08	8:13
CS-JS-03-1-3	0812211-15		SOIL	05-Aug-08	8:13
CS-JS-03-5-7	0812211-16		SOIL	05-Aug-08	8:19
CS-JS-03-10-12	0812211-17		SOIL	05-Aug-08	8:28
C-JS-04-0-1	0812211-18		SOIL	05-Aug-08	9:25
C-JS-04-1-3	0812211-19		SOIL	05-Aug-08	9:25



PARAGON
ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812211

Date:

Page 1 of 2

Project Name/No.: FM-1-VLP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: Steven.Vaughn@uscorp.com
Company: Freemont McMurran
Address: 62000 Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type ... HCl, etc.)	No. of Containers
C-JS-03-5-7	8/4/08	1034	1	S	n/a	1
C-JS-03-10-12	8/4/08	1043	2	S	n/a	1
C-JS-03-15-17	8/4/08	1103	3	S	n/a	1
C-JS-01-1-3	8/4/08	1138	4	S	n/a	1
C-JS-01-5-7	8/4/08	1144	5	S	n/a	1
EM-H22-5-7	7/31/08	1155	6	S	n/a	1
EM-K24-0-1	7/31/08	1340	7	S	n/a	1
EM-K24-1-3	7/31/08	1340	8	S	n/a	1
EM-K24-5-7	7/31/08	1358	9	S	n/a	1
C5-JS-01-10-12	8/4/08	1330	10	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Relinquished By: (1)	Relinquished By: (2)
Signature <u>K. Walsh</u>	Signature <u> </u>
Printed Name <u>K. Walsh</u>	Printed Name <u> </u>
Date <u>12-17-08</u>	Date <u> </u>
Time <u>1600</u>	Time <u> </u>
Company <u>ALS</u>	Company <u> </u>
Received By: (1)	Received By: (2)
Signature <u>Lara J. Orban</u>	Signature <u> </u>
Printed Name <u>Lara J. Orban</u>	Printed Name <u> </u>
Date <u>12/20/08</u>	Date <u> </u>
Time <u>1000</u>	Time <u> </u>
Company <u>ALS Paragon</u>	Company <u> </u>

Order No. 054807

Trk # 8117971 98613710



ALS Paragon

ALS Laboratory Group



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812211

Date:

Page 2 of 2

Project Name/No.: EMI-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due today) Dispose: today or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: steven.vaughn@arscorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes	
C5-JS-02-0-1	8/4/08	1406	11	S	N/A	1																														
C5-JS-02-1-3	8/4/08	1406	12	S	N/A	1																														
C5-JS-02-5-7	8/4/08	1415	13	S	N/A	1																														
C-JS-03-0-1	8/5/08	813	14	S	N/A	1																														
C-JS-03-1-3	8/5/08	813	15	S	N/A	1																														
C-JS-03-5-7	8/5/08	819	16	S	N/A	1																														
C-JS-03-10-12	8/5/08	828	17	S	N/A	1																														
C-JS-04-0-1	8/5/08	925	18	S	N/A	1																														
C-JS-04-1-3	8/5/08	925	19	S	N/A	1																														

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments:

Order No. 050808VT

Trk # 797198613710

Relinquished By:	Relinquished By:
Signature <u>K. Walsh</u>	Signature <u>Steve Vaughn</u>
Printed Name <u>Kevin Walsh</u>	Printed Name <u>Steve Vaughn</u>
Date <u>12-17-08</u> Time <u>1600</u>	Date <u>12/20/08</u> Time <u>1000</u>
Company <u>URS</u>	Company <u>ALS Paragon</u>
Received By:	Received By:
Signature <u>Steve Vaughn</u>	Signature <u>Steve Vaughn</u>
Printed Name <u>Steve Vaughn</u>	Printed Name <u>Steve Vaughn</u>
Date <u>12/20/08</u> Time <u>1000</u>	Date <u>12/20/08</u> Time <u>1000</u>
Company <u>ALS Paragon</u>	Company <u>ALS Paragon</u>

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812211Project Manager: JmcInitials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #12 (CS-JS-02-1-3) Sample ID on label CS-JS-01-1-3. - Date & Jmc matched used COC ID

• All samples only one 16 oz WMG received Filled 25% - 100%.

+ Samples #1 and 5 (C-JS-03-5-7 and CS-JS-01-5-7) were received with broken lids. Lids were replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pmProject Manager Signature / Date: Jmc 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

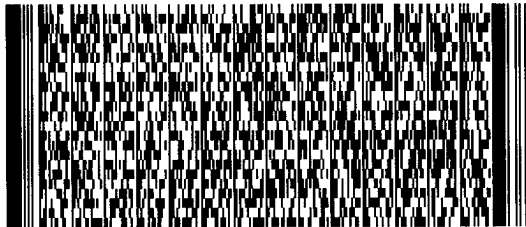
Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

C812211

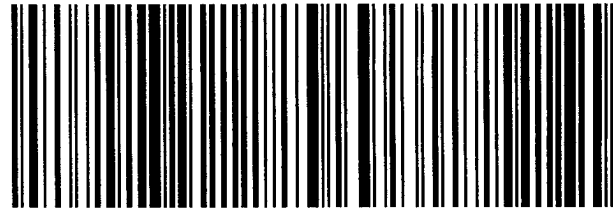


1 of 5
 TRK# 7971 9861 3710
 0201
 ## MASTER ##

MON - 22DEC AA
STANDARD OVERNIGHT

XH FTCA

80524
CO-US
DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812211-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812211-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Field ID:	C-JS-04-0-1
Lab ID:	0812211-18

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 05-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.506 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 1.5	2.6	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35230	32000	ug	90.8	40 - 110 %	
YTTRIUM	8713	5210	ug	59.8	40 - 110 %	
Total				54.3	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812211-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812211

1. This report consists of the analytical results for 19 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to potential matrix interference, the samples were prepared at a reduced ~1.0 gram aliquot. Three drops of NaNO₂ were added to the samples to prevent Pu bleed-through.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 02/27/09.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. U-234 and U-238 activity is reported in the associated method blank above the minimum detectable concentration value. The measured blank activity is below the requested MDC (0.1 pCi/g). Results are acceptable according to SOP715R15, and are submitted without further qualification. This sample is identified with "B3" flags on the final reports.
7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Laura Roberts
Laura Roberts
Radiochemistry Primary Data Reviewer

[Signature]
Radiochemistry Final Data Reviewer

3-7-09
Date

03/09/09
Date

Paragon Analytics

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812211

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-03-5-7	0812211-1		SOIL	04-Aug-08	10:34
C-JS-03-10-12	0812211-2		SOIL	04-Aug-08	10:43
C-JS-03-15-17	0812211-3		SOIL	04-Aug-08	11:03
CS-JS-01-1-3	0812211-4		SOIL	04-Aug-08	11:38
CS-JS-01-5-7	0812211-5		SOIL	04-Aug-08	11:44
EM-H22-5-7	0812211-6		SOIL	31-Jul-08	11:55
EM-K24-0-1	0812211-7		SOIL	31-Jul-08	13:40
EM-K24-1-3	0812211-8		SOIL	31-Jul-08	13:40
EM-K24-5-7	0812211-9		SOIL	31-Jul-08	13:58
CS-JS-01-10-12	0812211-10		SOIL	04-Aug-08	13:30
CS-JS-02-0-1	0812211-11		SOIL	04-Aug-08	14:06
CS-JS-02-1-3	0812211-12		SOIL	04-Aug-08	14:06
CS-JS-02-5-7	0812211-13		SOIL	04-Aug-08	14:15
CS-JS-03-0-1	0812211-14		SOIL	05-Aug-08	8:13
CS-JS-03-1-3	0812211-15		SOIL	05-Aug-08	8:13
CS-JS-03-5-7	0812211-16		SOIL	05-Aug-08	8:19
CS-JS-03-10-12	0812211-17		SOIL	05-Aug-08	8:28
C-JS-04-0-1	0812211-18		SOIL	05-Aug-08	9:25
C-JS-04-1-3	0812211-19		SOIL	05-Aug-08	9:25



PARAGON ANALYTICS

ALS Paragon

ALS Laboratory Group



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID **0812211**

Date: **12/17/08** Page **1** of **2**

Project Name/No.: **FM-1-VLP** Sampler(s): **K-Walsh** Turnaround (circle one): **Standard** or **Rush** (Due **12/17/08**) Dispose: **60 day** or **Return to Client**

Report To: **Steven Vaughn**
Phone: (520) 407-2845
Fax:

E-mail: **Steven.Vaughn@uscorp.com**
Company: **Freemont McMurran**
Address: **6200 W Duval Mine Rd**
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Lithium Isotope		
C-JS-03-5-7	8/4/08	1034	1	S	n/a	1																															
C-JS-03-10-12	8/4/08	1043	2	S	n/a	1																															
C-JS-03-15-17	8/4/08	1103	3	S	n/a	1																															
C5-JS-01-1-3	8/4/08	1138	4	S	n/a	1																															
C5-JS-01-5-7	8/4/08	1144	5	S	n/a	1																															
EM-H22-5-7	7/31/08	1155	6	S	n/a	1																															
EM-K24-0-1	7/31/08	1340	7	S	n/a	1																															
EM-K24-1-3	7/31/08	1340	8	S	n/a	1																															
EM-K24-5-7	7/31/08	1358	9	S	n/a	1																															
C5-JS-01-10-12	8/4/08	1330	10	S	n/a	1																															

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Relinquished By: (1)		Relinquished By: (2)	
Signature <u>Ken Walsh</u>	Signature _____	Signature _____	Signature _____
Printed Name <u>Ken Walsh</u>	Printed Name _____	Printed Name _____	Printed Name _____
Date <u>12-17-08</u>	Date _____	Date _____	Date _____
Time <u>1600</u>	Time _____	Time _____	Time _____
Company <u>URS</u>	Company _____	Company _____	Company _____
Received By: (1)		Received By: (2)	
Signature <u>Juan Alvarado</u>	Signature _____	Signature _____	Signature _____
Printed Name <u>Juan Alvarado</u>	Printed Name _____	Printed Name _____	Printed Name _____
Date <u>12/20/08</u>	Date _____	Date _____	Date _____
Time <u>1000</u>	Time _____	Time _____	Time _____
Company <u>ALS Paragon</u>	Company _____	Company _____	Company _____

Order No. 054807

Trk # **117971 98613710**



ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812211

Date:

Page 2 of 2

Project Name/No.: EMI-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due today) Dispose: today or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: steven.vaughn@arscorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes
C5-JS-02-0-1	8/4/08	1406	11	S	N/A	1																													
C5-JS-02-1-3	8/4/08	1406	12	S	N/A	1																													
C5-JS-02-5-7	8/4/08	1415	13	S	N/A	1																													
C-JS-03-0-1	8/5/08	813	14	S	N/A	1																													
C-JS-03-1-3	8/5/08	813	15	S	N/A	1																													
C-JS-03-5-7	8/5/08	819	16	S	N/A	1																													
C-JS-03-10-12	8/5/08	828	17	S	N/A	1																													
C-JS-04-0-1	8/5/08	925	18	S	N/A	1																													
C-JS-04-1-3	8/5/08	925	19	S	N/A	1																													

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Relinquished By: (1)

Signature: Kevin Walsh
Printed Name: Kevin Walsh
Date: 12-17-08 Time: 1600
Company: URS

Relinquished By: (2)

Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

Order No. 05088VT

Trck # 797198613710

Received By: (1)

Signature: Para J Orban
Printed Name: Para J Orban
Date: 12/20/08 Time: 1000
Company: ALS Paragon

Received By: (2)

Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmcWorkorder No: 0812211
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #12 (CS-JS-02-1-3) Sample ID on label CS-JS-01-1-3. - Date & Jmc matched used COC ID

• All samples only one 16 oz WMG received Filled 25% - 100%.

+ Samples #1 and 5 (C-JS-03-5-7 and CS-JS-01-5-7) were received with broken lids. Lids were replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pm

Project Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

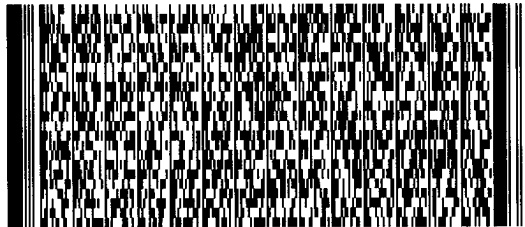
Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

C812211

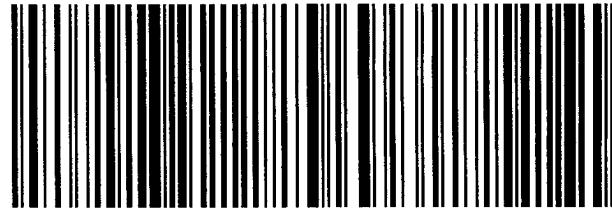


1 of 5
 TRK# 7971 9861 3710
 0201
 ## MASTER ##

MON - 22DEC AA
STANDARD OVERNIGHT

XH FTCA

80524
CO-US
DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090220-4MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Final Aliquot: 1.02 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.053 +/- 0.037	0.036	0.1	B3
15117-96-1	U-235	0.018 +/- 0.024	0.035	0.1	U
7440-61-1	U-238	0.045 +/- 0.033	0.015	0.1	B3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.417	3.74	pCi/g	84.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812211-1

Date Printed: Saturday, March 07, 2009

ALS Paragon
LIMS Version: 6.249A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090220-4LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Final Aliquot: 1.02 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.03 +/- 0.746	0.0542	4.24	95.0	82 - 122	P
7440-61-1	U-238	4.53 +/- 0.829	0.0712	4.41	103	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.417	3.52	pCi/g	79.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812211-1

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

Page 1 of 1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-5-7
Lab ID: 0812211-5DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.1 +/- 0.43	2.0 +/- 0.39	0.22	2.13	
15117-96-1	U-235	0.14 +/- 0.071	0.094 +/- 0.054	0.54	2.13	LT
7440-61-1	U-238	2.1 +/- 0.41	1.9 +/- 0.37	0.33	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
DER - Duplicate Error Ratio (see PAI SOP 715)
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: UR0812211-1

Date Printed: Saturday, March 07, 2009

ALS Paragon
LIMS Version: 6.249A

Page 1 of 2

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-1-3

Lab ID: 0812211-19DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.9 +/- 0.38	1.7 +/- 0.34	0.39	2.13	
15117-96-1	U-235	0.19 +/- 0.084	0.21 +/- 0.084	0.13	2.13	
7440-61-1	U-238	2.1 +/- 0.42	1.8 +/- 0.36	0.57	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-5-7
Lab ID:	0812211-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.029	0.1	
15117-96-1	U-235	0.10 +/- 0.055	0.018	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.448	3.87	pCi/g	87.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-10-12
Lab ID:	0812211-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.6 +/- 0.67	0.032	0.1	
15117-96-1	U-235	0.21 +/- 0.084	0.019	0.1	
7440-61-1	U-238	3.5 +/- 0.66	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.485	3.39	pCi/g	75.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-15-17
Lab ID:	0812211-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.7 +/- 0.68	0.037	0.1	
15117-96-1	U-235	0.16 +/- 0.071	0.019	0.1	
7440-61-1	U-238	4.2 +/- 0.77	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.462	3.67	pCi/g	82.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-01-1-3
Lab ID:	0812211-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.43	0.031	0.1	
15117-96-1	U-235	0.042 +/- 0.038	0.049	0.1	U
7440-61-1	U-238	2.0 +/- 0.39	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.377	3.43	pCi/g	78.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-01-5-7
Lab ID:	0812211-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.049	0.1	
15117-96-1	U-235	0.14 +/- 0.071	0.053	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.365	3.23	pCi/g	73.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-5-7

Lab ID: 0812211-5DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.056	0.1	
15117-96-1	U-235	0.094 +/- 0.054	0.050	0.1	LT
7440-61-1	U-238	1.9 +/- 0.37	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.403	3.91	pCi/g	88.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-5-7	Sample Matrix: SOIL	Prep Batch: AS090220-4	Final Aliquot: 1.02 g
Lab ID: 0812211-6	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-4-1	Prep Basis: Dry Weight
	Date Collected: 31-Jul-08	Run ID: AS090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.51	0.051	0.1	
15117-96-1	U-235	0.13 +/- 0.064	0.018	0.1	
7440-61-1	U-238	2.6 +/- 0.49	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.415	3.88	pCi/g	88.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-0-1	Sample Matrix: SOIL	Prep Batch: AS090220-4	Final Aliquot: 1.01 g
Lab ID: 0812211-7	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-4-1	Prep Basis: Dry Weight
	Date Collected: 31-Jul-08	Run ID: AS090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.052	0.1	
15117-96-1	U-235	0.12 +/- 0.063	0.052	0.1	
7440-61-1	U-238	1.7 +/- 0.34	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.69	pCi/g	82.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-K24-1-3
Lab ID:	0812211-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 31-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.041	0.1	
15117-96-1	U-235	0.081 +/- 0.049	0.018	0.1	LT
7440-61-1	U-238	1.3 +/- 0.28	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.449	4.03	pCi/g	90.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-K24-5-7
Lab ID:	0812211-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 31-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.046	0.1	
15117-96-1	U-235	0.049 +/- 0.041	0.049	0.1	U
7440-61-1	U-238	1.6 +/- 0.32	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.471	3.91	pCi/g	87.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-01-10-12
Lab ID:	0812211-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.042	0.1	
15117-96-1	U-235	0.087 +/- 0.050	0.034	0.1	LT
7440-61-1	U-238	2.4 +/- 0.46	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.213	3.69	pCi/g	87.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-0-1
Lab ID:	0812211-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.042	0.1	
15117-96-1	U-235	0.056 +/- 0.046	0.062	0.1	U
7440-61-1	U-238	1.8 +/- 0.37	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.413	3.84	pCi/g	87.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-1-3
Lab ID:	0812211-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.45	0.066	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.054	0.1	
7440-61-1	U-238	2.5 +/- 0.47	0.056	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.351	3.73	pCi/g	85.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-5-7
Lab ID:	0812211-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.34	0.039	0.1	
15117-96-1	U-235	0.098 +/- 0.058	0.046	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.475	3.62	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-0-1	Sample Matrix: SOIL	Prep Batch: AS090220-4	Final Aliquot: 1.01 g
Lab ID: 0812211-14	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-4-1	Prep Basis: Dry Weight
	Date Collected: 05-Aug-08	Run ID: AS090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.042	0.1	
15117-96-1	U-235	0.077 +/- 0.050	0.049	0.1	LT
7440-61-1	U-238	1.8 +/- 0.37	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.458	3.86	pCi/g	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-03-1-3
Lab ID:	0812211-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.35	0.098	0.1	
15117-96-1	U-235	0.12 +/- 0.081	0.083	0.1	
7440-61-1	U-238	1.5 +/- 0.36	0.063	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.479	2.33	pCi/g	52.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-03-5-7
Lab ID:	0812211-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.27	0.016	0.1	
15117-96-1	U-235	0.071 +/- 0.047	0.043	0.1	LT
7440-61-1	U-238	1.4 +/- 0.29	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.415	3.89	pCi/g	88.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-10-12	Sample Matrix: SOIL	Prep Batch: AS090220-4	Final Aliquot: 1.01 g
Lab ID: 0812211-17	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-4-1	Prep Basis: Dry Weight
	Date Collected: 05-Aug-08	Run ID: AS090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.037	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.043	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.490	3.91	pCi/g	87.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-0-1	Sample Matrix: SOIL	Prep Batch: AS090220-4	Final Aliquot: 1.00 g
Lab ID: 0812211-18	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-4-1	Prep Basis: Dry Weight
	Date Collected: 05-Aug-08	Run ID: AS090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.33	0.045	0.1	
15117-96-1	U-235	0.071 +/- 0.047	0.043	0.1	LT
7440-61-1	U-238	1.5 +/- 0.31	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.517	3.92	pCi/g	86.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-04-1-3
Lab ID:	0812211-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.056	0.1	
15117-96-1	U-235	0.19 +/- 0.084	0.061	0.1	
7440-61-1	U-238	2.1 +/- 0.42	0.064	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.41	pCi/g	77.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-1-3

Lab ID: 0812211-19DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.042	0.1	
15117-96-1	U-235	0.21 +/- 0.084	0.043	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.209	3.44	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

Page 2 of 2



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812211

1. The following report consists of analytical results and supporting documentation for 18 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared according to procedure SOP739R9. Sample 0812211-17 and samples 0812211-2, -3, -6, -7, -8, -9, and -13 were sealed in steel cans on 12/30/08 and 01/02/09, respectively, and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/23/09 and 01/21/09 is at least 97.78%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.89%.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/26/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volume was insufficient to allow preparation of a duplicate in batch GS090106-6. Duplicate analysis of sample 0812211-1 was performed in lieu of a prepared duplicate.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples. This is applicable for samples 0812211-2, -3, -6, -7, -8, -9, -13, and -17.
7. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium. This is applicable for samples 0812211-2, -3, -6, -7, -8, -9, -13, and -17.



8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. The requested detection limit of 1.0 pCi/gram for ^{228}Ra was not met for samples 0812211-1, -1DUP, -3, -4, -5, -15, -16, and -19. The reported activities are greater than the achieved detection limits. The results have been flagged with a "M3" qualifier on the final reports. The results are submitted without further qualification.
11. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Lara Orban

Lara Orban

Radiochemistry Primary Data Reviewer

02/16/09

Date

Alvin J. Jeyar

Radiochemistry Final Data Reviewer

2-16-09

Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812211

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
C-JS-03-5-7	0812211-1		SOIL	04-Aug-08	10:34
C-JS-03-10-12	0812211-2		SOIL	04-Aug-08	10:43
C-JS-03-15-17	0812211-3		SOIL	04-Aug-08	11:03
CS-JS-01-1-3	0812211-4		SOIL	04-Aug-08	11:38
CS-JS-01-5-7	0812211-5		SOIL	04-Aug-08	11:44
EM-H22-5-7	0812211-6		SOIL	31-Jul-08	11:55
EM-K24-0-1	0812211-7		SOIL	31-Jul-08	13:40
EM-K24-1-3	0812211-8		SOIL	31-Jul-08	13:40
EM-K24-5-7	0812211-9		SOIL	31-Jul-08	13:58
CS-JS-01-10-12	0812211-10		SOIL	04-Aug-08	13:30
CS-JS-02-0-1	0812211-11		SOIL	04-Aug-08	14:06
CS-JS-02-1-3	0812211-12		SOIL	04-Aug-08	14:06
CS-JS-02-5-7	0812211-13		SOIL	04-Aug-08	14:15
CS-JS-03-0-1	0812211-14		SOIL	05-Aug-08	8:13
CS-JS-03-1-3	0812211-15		SOIL	05-Aug-08	8:13
CS-JS-03-5-7	0812211-16		SOIL	05-Aug-08	8:19
CS-JS-03-10-12	0812211-17		SOIL	05-Aug-08	8:28
C-JS-04-0-1	0812211-18		SOIL	05-Aug-08	9:25
C-JS-04-1-3	0812211-19		SOIL	05-Aug-08	9:25



PARAGON
ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812211

Date:

Page 1 of 2

Project Name/No.: FM1-VLP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: Steven.Vaughn@uscorp.com
Company: Freemont McMurran
Address: 62000 Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type ... HCl, etc.)	No. of Containers
C-33-03-5-7	8/4/08	1034	1	S	n/a	1
C-33-03-10-12	8/4/08	1043	2	S	n/a	1
C-33-03-15-17	8/4/08	1103	3	S	n/a	1
C-33-01-1-3	8/4/08	1138	4	S	n/a	1
C-33-01-5-7	8/4/08	1144	5	S	n/a	1
EM-H22-5-7	7/31/08	1155	6	S	n/a	1
EM-K24-0-1	7/31/08	1340	7	S	n/a	1
EM-K24-1-3	7/31/08	1340	8	S	n/a	1
EM-K24-5-7	7/31/08	1358	9	S	n/a	1
C-33-01-10-12	8/4/08	1330	10	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Relinquished By: (1)	Relinquished By: (2)
Signature <u>K. Walsh</u>	Signature <u> </u>
Printed Name <u>K. Walsh</u>	Printed Name <u> </u>
Date <u>12-17-08</u>	Date <u> </u>
Time <u>1600</u>	Time <u> </u>
Company <u>ALS</u>	Company <u> </u>
Received By: (1)	Received By: (2)
Signature <u>Jana Aban</u>	Signature <u> </u>
Printed Name <u>Jana Aban</u>	Printed Name <u> </u>
Date <u>12/20/08</u>	Date <u> </u>
Time <u>1000</u>	Time <u> </u>
Company <u>ALS Paragon</u>	Company <u> </u>

Order No. 054807

Trk # 17971 98613710



ALS Paragon

ALS Laboratory Group



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID

0812211

Date:

Page 2 of 2

Project Name/No.: EMI-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due today) Dispose: today or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:

E-mail: steven.vaughn@arscorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes	
C-35-02-0-1	8/4/08	1406	11	S	N/A	1																														
C-35-02-1-3	8/4/08	1406	12	S	N/A	1																														
C-35-02-5-7	8/4/08	1415	13	S	N/A	1																														
C-35-03-0-1	8/5/08	813	14	S	N/A	1																														
C-35-03-1-3	8/5/08	813	15	S	N/A	1																														
C-35-03-5-7	8/5/08	819	16	S	N/A	1																														
C-35-03-10-12	8/5/08	828	17	S	N/A	1																														
C-35-04-0-1	8/5/08	925	18	S	N/A	1																														
C-35-04-1-3	8/5/08	925	19	S	N/A	1																														

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments:

Order No. 05088VT

Trk # 797198613710

Relinquished By: (1)

Signature: Kevin Walsh
Printed Name: Kevin Walsh
Date: 12-17-08 Time: 1600
Company: URS

Relinquished By: (2)

Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

Received By: (1)

Signature: Para J Orban
Printed Name: Para J Orban
Date: 12/20/08 Time: 1000
Company: ALS Paragon

Received By: (2)

Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JmcWorkorder No: 0812211
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>0</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #12 (CS-JS-02-1-3) Sample ID on label CS-JS-01-1-3. - Date & Jmc matched used COC ID

• All samples only one 16 oz WMG received Filled 25% - 100%.

+ Samples #1 and 5 (C-JS-03-5-7 and CS-JS-01-5-7) were received with broken lids. Lids were replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: pm

Project Manager Signature / Date: [Signature] 12/23/08

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

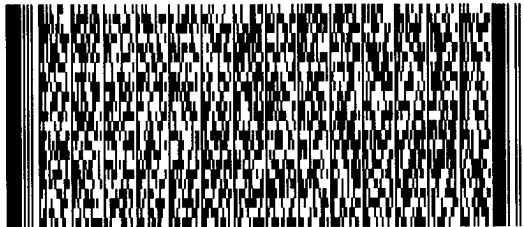
Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

C812211

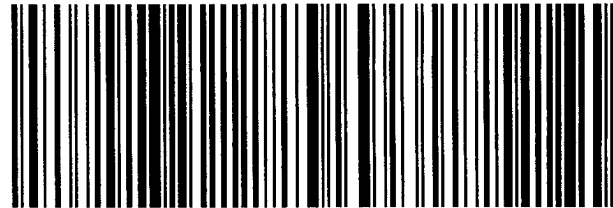


1 of 5
 TRK# 7971 9861 3710
 0201
 ## MASTER ##

MON - 22DEC AA
STANDARD OVERNIGHT

XH FTCA

80524
CO-US
DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.048 +/- 0.21	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.14 +/- 0.40	0.83	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6MB

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 191 g

Result Units: pCi/g

File Name: 090107d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.0088 +/- 0.18	0.34	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-6MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Final Aliquot: 84.5 g

Result Units: pCi/g

File Name: 090115d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.27 +/- 0.42	0.72	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 191 g

Result Units: pCi/g

File Name: 090107d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.16 +/- 0.32	0.57	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-6LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090080d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1070 +/- 126	10.6	986	108	85 - 115	P
10198-40-0	Co-60	464 +/- 54.4	1.35	456	102	85 - 115	P
10045-97-3	Cs-137	391 +/- 45.8	1.69	374	105	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812211-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

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Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090122d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	452 +/- 53.0	2.54	470	96.2	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090076d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	467 +/- 55.3	7.35	462	101	85 - 115	P
10198-40-0	Co-60	208 +/- 24.4	0.792	214	97.3	85 - 115	P
10045-97-3	Cs-137	181 +/- 21.3	1.18	175	103	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6ALCS

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090111d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	449 +/- 52.6	2.50	470	95.5	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812211-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090112d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	475 +/- 56.3	7.11	462	103	85 - 115	P
10198-40-0	Co-60	209 +/- 24.6	0.818	213	98.0	85 - 115	P
10045-97-3	Cs-137	183 +/- 21.6	1.18	175	105	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812211-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-5-7

Lab ID: 0812211-1DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090101d07

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.1 +/- 0.66	2.9 +/- 0.89	0.76	2.13	M3,G,TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-5-7
Lab ID:	0812211-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090145d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.66	1.1	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-5-7

Lab ID: 0812211-1DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090101d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.9 +/- 0.89	1.5	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-10-12

Lab ID: 0812211-2

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090153d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.45	0.70	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-10-12

Lab ID: 0812211-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090153d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.74	0.99	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-15-17

Lab ID: 0812211-3

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 158 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090102d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.41	0.55	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-15-17

Lab ID: 0812211-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 158 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090102d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.67	1.0	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-01-1-3
Lab ID:	0812211-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 84.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090100d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.79	1.5	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-5-7

Lab ID: 0812211-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090146d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.4 +/- 0.91	1.1	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-5-7

Lab ID: 0812211-6

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 200 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090160d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.41	0.43	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-5-7

Lab ID: 0812211-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 200 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090160d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.54	0.89	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-0-1

Lab ID: 0812211-7

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 199 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090103d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.35	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-0-1

Lab ID: 0812211-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 199 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090103d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.57	0.84	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-1-3

Lab ID: 0812211-8

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 209 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090104d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.37	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-1-3	Sample Matrix: SOIL	Prep Batch: GS090109-6	Final Aliquot: 209 g
Lab ID: 0812211-8	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-6-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 31-Jul-08	Run ID: GS090109-6A	Moisture(%): NA
	Date Prepared: 02-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090104d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.57	0.74	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-5-7

Lab ID: 0812211-9

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090105d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.39	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-5-7

Lab ID: 0812211-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090105d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.59	0.70	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-10-12

Lab ID: 0812211-10

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 72.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090147d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.77	0.98	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-02-0-1

Lab ID: 0812211-11

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 82.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090148d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.74	0.94	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-1-3
Lab ID:	0812211-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 103 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090149d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.53	0.73	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-5-7
Lab ID:	0812211-13

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 185 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090156d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.38	0.61	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-02-5-7

Lab ID: 0812211-13

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 185 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090156d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.63	0.77	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-0-1

Lab ID: 0812211-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090150d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.64	1.0	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-03-1-3
Lab ID:	0812211-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090152d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.62	1.0	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-5-7

Lab ID: 0812211-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 92.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090104d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.4	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-10-12

Lab ID: 0812211-17

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 180 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090074d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.46	0.51	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-10-12

Lab ID: 0812211-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 180 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090074d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.66	0.99	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-1-3

Lab ID: 0812211-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 86.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090108d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.73	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1



March 12, 2009

Mr. Aaron Hilshorst
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-212
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Hilshorst:

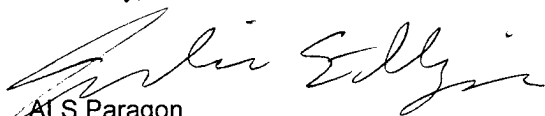
Seventeen soil samples were received from Freeport McMoRan Sierrita on December 20, 2008. The samples were scheduled for the following analyses.

Isotopic Uranium	pages 1-28
Gamma Spectroscopy	pages 1-49
Radium-226 by EPA Method 903.1(m)	pages 1-22

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/eh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812212

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CS-JS-05-0-1	0812212-1		SOIL	27-Aug-08	13:28
CS-JS-05-1-3D	0812212-2		SOIL	27-Aug-08	13:28
CS-JS-06-0-1	0812212-3		SOIL	27-Aug-08	13:48
EM-JS-02-0-1	0812212-4		SOIL	01-Aug-08	9:17
EM-JS-01-0-1	0812212-5		SOIL	01-Aug-08	9:43
EM-JS-01-1-3	0812212-6		SOIL	01-Aug-08	9:43
EM-M26-0-1	0812212-7		SOIL	01-Aug-08	9:56
EM-M26-1-3	0812212-8		SOIL	01-Aug-08	9:56
EM-M26-5-7	0812212-9		SOIL	01-Aug-08	10:04
C-JS-01-0-1	0812212-10		SOIL	01-Aug-08	12:39
C-JS-01-1-3	0812212-11		SOIL	01-Aug-08	13:39
C-JS-02-1-3	0812212-12		SOIL	01-Aug-08	12:56
C-JS-02-5-7	0812212-13		SOIL	01-Aug-08	13:02
EM-H22-0-1	0812212-14		SOIL	30-Jul-08	9:37
EM-H22-1-3	0812212-15		SOIL	30-Jul-08	9:37
C-JS-03-0-1	0812212-16		SOIL	04-Aug-08	10:25
C-JS-03-1-3	0812212-17		SOIL	04-Aug-08	10:31



PARAGON
ANALYTICALS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812212

Date: 12-17-08 Page 1 of 2

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Project Name/No.: FMI-V-137 Sampler(s): Turnaround (circle one): Standard or Rush (Due) Dispose: Date 60 day or Return to Client

Report To: Steven Vaughan
Phone: (520) 407-2345
Fax:
E-mail: steven_vaughan@uscorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers
C5-J5-05-0-1	8/21/08	1328	1	S	n/a	1
C5-J5-05-1-3	8/21/08	1328	2	S	n/a	1
C6-J5-05-1-3 D	8/21/08	1328	3	S	n/a	1
C5-J5-06-0-1	8/27/08	1348	3	S	n/a	1
C6-J5-06-1-3	8/27/08	1353	3	S	n/a	1
EM-J5-02-0-1	8/1/08	917	4	S	n/a	1
EM-J5-01-0-1	8/1/08	943	5	S	n/a	1
EM-J5-01-1-3	8/1/08	943	6	S	n/a	1
EM-M26-0-1	8/1/08	956	7	S	n/a	1
EM-M26-1-3	8/1/08	956	8	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: Order No. 0508VT

Trk # 79620289 8941

Relinquished By:	Signature	Printed Name	Date	Time
(1)	Ken Wal	Ken Wal	12-17-08	1600
Relinquished By:	Signature	Printed Name	Date	Time
(2)				

Received By:	Signature	Printed Name	Date	Time
(1)	Jana Orban	Jana Orban	12/17/08	1000
Received By:	Signature	Printed Name	Date	Time
(2)				

Form 20216.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812212
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES <input type="radio"/> NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	<input type="radio"/> YES <input type="radio"/> NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES <input type="radio"/> NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	<input type="radio"/> YES <input type="radio"/> NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	<input type="radio"/> YES <input type="radio"/> NO
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<input checked="" type="radio"/> N/A	<input type="radio"/> YES <input type="radio"/> NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	<input type="radio"/> YES <input type="radio"/> NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	<input type="radio"/> YES <input type="radio"/> NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY <input type="radio"/> YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>10</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #9 (EM-M26-5-7) Sample time listed on ID label 1006.
 • Limited sample due to one 16oz WMG received for all tests (20 to 50% full)
 + Samples CS-JS-05-1-3 and C-JS-02-0-1 were received broken.
 Sample #2 (CS-JS-05-1-3D) Sample was received with a broken lid. Lid was replaced.

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rich Smith Date/Time: _____Project Manager Signature / Date: [Signature]

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL511208/20/23

Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

0812212

2 of 5

MON - 22DEC

AA

MPS# 7962 0209 8941
 0263

STANDARD OVERNIGHT

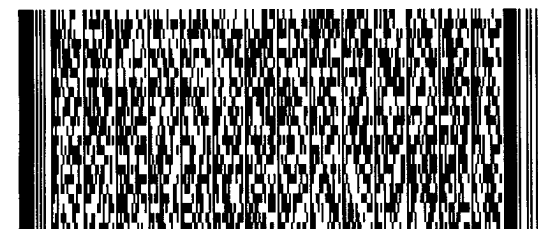
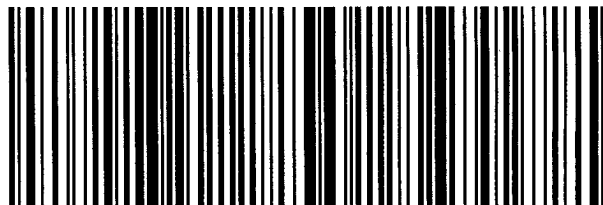
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

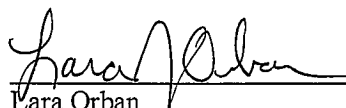
Freeport McMoRan Sierrita

FMI-VRP

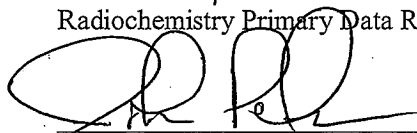
Work Order Number: 0812212

1. This report consists of the analytical results for 11 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/05/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer

3/6/09
Date


Radiochemistry Final Data Reviewer

03/09/09
Date

Paragon Analytics

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812212

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CS-JS-05-0-1	0812212-1		SOIL	27-Aug-08	13:28
CS-JS-05-1-3D	0812212-2		SOIL	27-Aug-08	13:28
CS-JS-06-0-1	0812212-3		SOIL	27-Aug-08	13:48
EM-JS-02-0-1	0812212-4		SOIL	01-Aug-08	9:17
EM-JS-01-0-1	0812212-5		SOIL	01-Aug-08	9:43
EM-JS-01-1-3	0812212-6		SOIL	01-Aug-08	9:43
EM-M26-0-1	0812212-7		SOIL	01-Aug-08	9:56
EM-M26-1-3	0812212-8		SOIL	01-Aug-08	9:56
EM-M26-5-7	0812212-9		SOIL	01-Aug-08	10:04
C-JS-01-0-1	0812212-10		SOIL	01-Aug-08	12:39
C-JS-01-1-3	0812212-11		SOIL	01-Aug-08	13:39
C-JS-02-1-3	0812212-12		SOIL	01-Aug-08	12:56
C-JS-02-5-7	0812212-13		SOIL	01-Aug-08	13:02
EM-H22-0-1	0812212-14		SOIL	30-Jul-08	9:37
EM-H22-1-3	0812212-15		SOIL	30-Jul-08	9:37
C-JS-03-0-1	0812212-16		SOIL	04-Aug-08	10:25
C-JS-03-1-3	0812212-17		SOIL	04-Aug-08	10:31



Chain-of-Custody

LAB ID

800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Report To: Steven Vaughn
Phone: (520) 407-2345
Fax:
E-mail: steven_vaughn@ufscoorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

[illegible]

Fax:
E-mail: steven_vaughn@ufscorp.com
Company: Freeport McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

[illegible]

	(1)	(2)
Time Zone:	EST	CST
Matrix Key:	Q = oil	S = soil
Matrix KeV:	Q = non-soil solid,	S = water.
Relinquished By:	= liquid.	E = extract.
Relinquished By:	F = filter	

Relinquished By: _____ (1)

Signature Kevin Walsh Signature _____
 Printed Name Kevin Walsh Printed Name _____
 Date 12-17-00 Time 1600 Date _____ Time _____
 Company URS Company _____

	-	✓	(1)	Received By:
	-	✓	(1)	Received By:
	-	✓	(2)	Received By:

Received By:	MA	(1)
--------------	----	-----

Received by: Paula P. Orban Date: 12/10/08 Time: 1000
 Signature: _____ Printed Name: _____ Company: W.S. Paces
 _____ _____ _____

Form 202r6.xls (6/16/06)

1



PARAGON ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 480-1511 (970) 490-1522 Fax

LAB ID

0812212

Date:

Page 2 of 2

Project Name/No.: FM-VIP Sampler(s): K Walsh Turnaround (circle one): Standard or Rush (Due) Dispose? Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: steven.vaughn@irs.org
Company: Freight McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers
FM-M26-5-7	8/1/08	1004	9	S	n/a	1
C-JS-01-0-1	8/1/08	1239	10	S	n/a	1
C-JS-01-1-3	8/1/08	1239	11	S	n/a	1
C-JS-02-0-1	8/1/08	1256	12	S	n/a	1
C-JS-02-1-3	8/1/08	1256	12	S	n/a	1
C-JS-02-5-7	8/1/08	1302	13	S	n/a	1
FM-H22-0-1	7/30/08	937	14	S	n/a	1
FM-H22-1-3	7/30/08	937	15	S	n/a	1
C-JS-03-0-1	8/4/08	1025	16	S	n/a	1
C-JS-03-1-3	8/4/08	1031	17	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Relinquished By: <u>K Walsh</u> Signature _____ Printed Name <u>Kenneth Walsh</u> Date <u>12-17-08</u> Time <u>1600</u> Company <u>URS</u>		Relinquished By: <u> </u> Signature _____ Printed Name _____ Date _____ Time _____ Company _____	
Received By: <u>Steven Vaughn</u> Signature _____ Printed Name <u>Steve Vaughn</u> Date <u>12/20/08</u> Time <u>1000</u> Company <u>ALS Paragon</u>		Received By: <u> </u> Signature _____ Printed Name _____ Date _____ Time _____ Company _____	

Order No. 054807

Tik # 796202098941

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812212
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF <u>YES</u>	NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u> •
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> +
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4 <u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

- * Sample #9 (EM-M26-5-7) Sample time listed on ID label 1006.
 • Limited sample due to one 16oz WMG received for all tests (20 to 50% full)
 + Samples CS-JS-05-1-3 and C-JS-02-0-1 were received broken.
 Sample #2 (CS-JS-05-1-3D) Sample was received with a broken lid. Lid was replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: _____Project Manager Signature / Date: [Signature]

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705

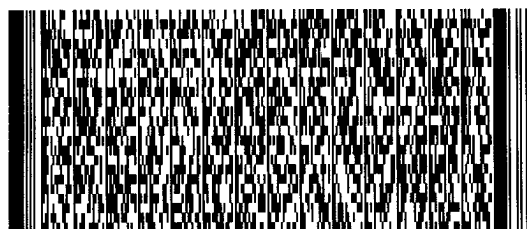


JCL511288/28/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

14
-1
0812212

2 of 5

MON - 22DEC

AA

MPS# 7962 0209 8941

0263

STANDARD OVERNIGHT

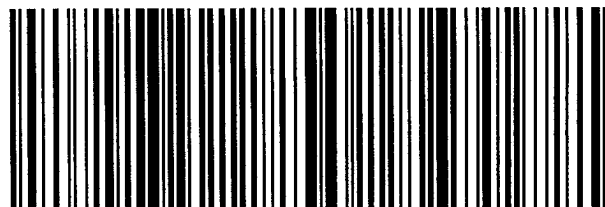
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-4MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.12 +/- 0.20	0.42	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812212-1

Date Printed: Friday, March 06, 2009

ALS Paragon
LIMS Version: 6.249A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-4LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	44.3 +/- 8.18	0.223	42.8	104	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812212-1

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-0-1

Lab ID: 0812212-16MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	54.0	1.9	0.653	43.2	121	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812212-1

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-01-1-3
Lab ID: 0812212-6DUP

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.6 +/- 0.50	0.72 +/- 0.48	1.30	2.13	LT

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
DER - Duplicate Error Ratio (see PAI SOP 715)
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-05-1-3D
Lab ID:	0812212-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 27-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.6 +/- 1.2	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-02-0-1
Lab ID:	0812212-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.74	0.31	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-01-1-3
Lab ID:	0812212-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.50	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-01-1-3

Lab ID: 0812212-6DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.09 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.72 +/- 0.48	0.68	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812212-1

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-M26-0-1
Lab ID:	0812212-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.68	0.43	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-M26-1-3
Lab ID:	0812212-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.50	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	C-JS-01-0-1
Lab ID:	0812212-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.53	0.48	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	C-JS-01-1-3
Lab ID:	0812212-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.62	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	C-JS-02-5-7
Lab ID:	0812212-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.0 +/- 0.98	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-H22-1-3
Lab ID:	0812212-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 30-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.55	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	C-JS-03-0-1
Lab ID:	0812212-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.61	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812212-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	C-JS-03-1-3
Lab ID:	0812212-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.91 +/- 0.35	0.073	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812212

1. This report consists of the analytical results for 17 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to potential matrix interference, a reduced aliquot of ~1.0 gram was taken on all samples.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 02/25/09.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Laura Roberts

Laura Roberts
Radiochemistry Primary Data Reviewer

3-7-09

Date

[Signature]

Radiochemistry Final Data Reviewer

03/09/09

Date

Paragon Analytics

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812212

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CS-JS-05-0-1	0812212-1		SOIL	27-Aug-08	13:28
CS-JS-05-1-3D	0812212-2		SOIL	27-Aug-08	13:28
CS-JS-06-0-1	0812212-3		SOIL	27-Aug-08	13:48
EM-JS-02-0-1	0812212-4		SOIL	01-Aug-08	9:17
EM-JS-01-0-1	0812212-5		SOIL	01-Aug-08	9:43
EM-JS-01-1-3	0812212-6		SOIL	01-Aug-08	9:43
EM-M26-0-1	0812212-7		SOIL	01-Aug-08	9:56
EM-M26-1-3	0812212-8		SOIL	01-Aug-08	9:56
EM-M26-5-7	0812212-9		SOIL	01-Aug-08	10:04
C-JS-01-0-1	0812212-10		SOIL	01-Aug-08	12:39
C-JS-01-1-3	0812212-11		SOIL	01-Aug-08	13:39
C-JS-02-1-3	0812212-12		SOIL	01-Aug-08	12:56
C-JS-02-5-7	0812212-13		SOIL	01-Aug-08	13:02
EM-H22-0-1	0812212-14		SOIL	30-Jul-08	9:37
EM-H22-1-3	0812212-15		SOIL	30-Jul-08	9:37
C-JS-03-0-1	0812212-16		SOIL	04-Aug-08	10:25
C-JS-03-1-3	0812212-17		SOIL	04-Aug-08	10:31



225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Project Name/No.:	FMI-VIP	Sampler(s):	
-------------------	---------	-------------	--

Report To: Steven Vaughan

Phone: (520) 407-2845

Fax:

E-mail: steven_vaughn@uscorp.com

Company: Freeport, McMoran

Address: 6200 W Daval Mile Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers
CS-J5-05-0-1	8/21/08	1328	1	S	n/a	1
CS-J5-05-1-3	8/21/08	1328	2	S	n/a	1
CS-J5-05-1-3 D	8/21/08	1328	3	S	n/a	1
CS-J5-06-0-1	8/21/08	1348	3	S	n/a	1
CS-J5-06-1-3	8/21/08	1353		S	n/a	1
EM-J5-02-0-1	8/1/08	947	4	S	n/a	1
EM-J5-01-0-1	8/1/08	943	5	S	n/a	1
EM-J5-01-1-3	8/1/08	943	6	S	n/a	1
EM-M26-0-1	8/1/08	956	7	S	n/a	1
EM-M26-1-3	8/1/08	956	8	S	n/a	1

* Time Zone: EST CST MST PST

Comments:

Order No. 050807

Trk # 7962028 8941



PARAGON ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 480-1511 (970) 490-1522 Fax

LAB ID

0812212

Date:

Page 2 of 2

Project Name/No.: PM-VIP Sampler(s): K Walsh Turnaround (circle one): Standard or Rush (Due) Dispose? Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: steven.vaughn@irsorp.com
Company: Freight McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers
EM-M26-5-7	8/1/08	1004	9	S	n/a	1
C-JS-01-0-1	8/1/08	1239	10	S	n/a	1
C-JS-01-1-3	8/1/08	1239	11	S	n/a	1
C-JS-02-0-1	8/1/08	1256	✓	S	n/a	1
C-JS-02-1-3	8/1/08	1256	12	S	n/a	1
C-JS-02-5-7	8/1/08	1302	13	S	n/a	1
EM-H22-0-1	7/30/08	937	14	S	n/a	1
EM-H22-1-3	7/30/08	937	15	S	n/a	1
C-JS-03-0-1	8/4/08	1025	16	S	n/a	1
C-JS-03-1-3	8/4/08	1031	17	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: Order No. 054807
Tik # 796202098941

Relinquished By: (1) Signature: <u>K Walsh</u> Printed Name: <u>Kenneth Walsh</u> Date: <u>12-17-08</u> Time: <u>1600</u> Company: <u>URS</u>		Relinquished By: (2) Signature: <u> </u> Printed Name: <u> </u> Date: <u> </u> Time: <u> </u> Company: <u> </u>	
Received By: (1) Signature: <u>Steven Vaughn</u> Printed Name: <u>Steve Vaughn</u> Date: <u>12/20/08</u> Time: <u>1000</u> Company: <u>ALS Paragon</u>		Received By: (2) Signature: <u> </u> Printed Name: <u> </u> Date: <u> </u> Time: <u> </u> Company: <u> </u>	

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812212
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u> NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u> •
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> +
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<u>RAD ONLY</u> YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #9 (EM-M26-5-7) Sample time listed on ID label 1006.
 • Limited sample due to one 16oz WMG received for all tests (20 to 50% full)
 + Samples CS-JS-05-1-3 and C-JS-02-0-1 were received broken.
 Sample #2 (CS-JS-05-1-3D) Sample was received with a broken lid. Lid was replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: _____Project Manager Signature / Date: [Signature]

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705

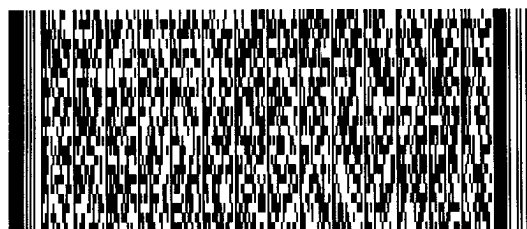


JCL511288/28/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

14
-1
0812212

2 of 5

MON - 22DEC

AA

MPS# 7962 0209 8941

0263

STANDARD OVERNIGHT

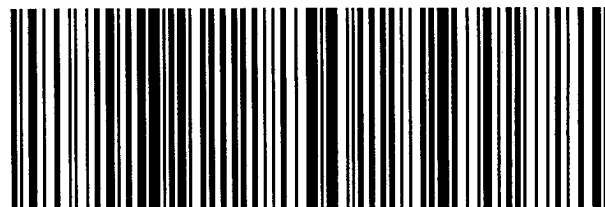
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090220-2MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Final Aliquot: 1.03 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.010 +/- 0.021	0.044	0.1	U
15117-96-1	U-235	-0.0020 +/- 0.024	0.035	0.1	U
7440-61-1	U-238	0.0045 +/- 0.020	0.044	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.376	3.61	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812212-1

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090220-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Final Aliquot: 1.03 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.22 +/- 0.761	0.0296	4.20	100	82 - 122	P
7440-61-1	U-238	4.54 +/- 0.814	0.0355	4.37	104	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.376	3.57	pCi/g	81.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812212-1

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-06-0-1

Lab ID: 0812212-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.5 +/- 0.31	1.3 +/- 0.28	0.32	2.13	
15117-96-1	U-235	0.096 +/- 0.054	0.13 +/- 0.063	0.39	2.13	
7440-61-1	U-238	1.6 +/- 0.33	1.5 +/- 0.31	0.29	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812212-1

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-05-0-1
Lab ID:	0812212-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 27-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.3 +/- 0.62	0.042	0.1	
15117-96-1	U-235	0.19 +/- 0.080	0.044	0.1	
7440-61-1	U-238	3.3 +/- 0.62	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.468	3.85	pCi/g	86.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-05-1-3D	Sample Matrix: SOIL	Prep Batch: AS090220-2	Final Aliquot: 1.01 g
Lab ID: 0812212-2	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-2-1	Prep Basis: Dry Weight
	Date Collected: 27-Aug-08	Run ID: AS090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	6.6 +/- 1.2	0.032	0.1	
15117-96-1	U-235	0.34 +/- 0.11	0.020	0.1	
7440-61-1	U-238	6.6 +/- 1.2	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.488	3.85	pCi/g	85.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-06-0-1
Lab ID:	0812212-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 27-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.046	0.1	
15117-96-1	U-235	0.096 +/- 0.054	0.019	0.1	LT
7440-61-1	U-238	1.6 +/- 0.33	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.181	3.38	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-06-0-1

Lab ID: 0812212-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.28	0.041	0.1	
15117-96-1	U-235	0.13 +/- 0.063	0.018	0.1	
7440-61-1	U-238	1.5 +/- 0.31	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.278	3.56	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-02-0-1
Lab ID:	0812212-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.10 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.043	0.1	
15117-96-1	U-235	0.13 +/- 0.062	0.034	0.1	
7440-61-1	U-238	2.5 +/- 0.47	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.113	3.55	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-01-0-1
Lab ID:	0812212-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.079	0.1	
15117-96-1	U-235	0.079 +/- 0.050	0.047	0.1	LT
7440-61-1	U-238	1.7 +/- 0.35	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	3.82	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-01-1-3
Lab ID:	0812212-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.55	0.053	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.042	0.1	
7440-61-1	U-238	2.9 +/- 0.54	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.421	3.89	pCi/g	88.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-M26-0-1
Lab ID:	0812212-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.054	0.1	
15117-96-1	U-235	0.11 +/- 0.064	0.058	0.1	
7440-61-1	U-238	1.7 +/- 0.36	0.054	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.29	pCi/g	73.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-M26-1-3
Lab ID:	0812212-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.46	0.045	0.1	
15117-96-1	U-235	0.13 +/- 0.063	0.036	0.1	
7440-61-1	U-238	2.5 +/- 0.48	0.045	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.372	3.46	pCi/g	79.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-M26-5-7
Lab ID:	0812212-9

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.51	0.029	0.1	
15117-96-1	U-235	0.25 +/- 0.090	0.034	0.1	
7440-61-1	U-238	2.9 +/- 0.54	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.496	3.88	pCi/g	86.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-01-0-1
Lab ID:	0812212-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.032	0.1	
15117-96-1	U-235	0.092 +/- 0.053	0.019	0.1	LT
7440-61-1	U-238	1.5 +/- 0.31	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.467	3.59	pCi/g	80.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-01-1-3	Sample Matrix: SOIL	Prep Batch: AS090220-2	Final Aliquot: 1.01 g
Lab ID: 0812212-11	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-2-1	Prep Basis: Dry Weight
	Date Collected: 01-Aug-08	Run ID: AS090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.030	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.018	0.1	
7440-61-1	U-238	1.7 +/- 0.34	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.463	3.58	pCi/g	80.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-02-1-3	Sample Matrix: SOIL	Prep Batch: AS090220-2	Final Aliquot: 1.04 g
Lab ID: 0812212-12	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-2-1	Prep Basis: Dry Weight
	Date Collected: 01-Aug-08	Run ID: AS090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.49	0.036	0.1	
15117-96-1	U-235	0.088 +/- 0.051	0.018	0.1	LT
7440-61-1	U-238	2.6 +/- 0.50	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.324	3.46	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-02-5-7
Lab ID:	0812212-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.3 +/- 0.62	0.029	0.1	
15117-96-1	U-235	0.20 +/- 0.082	0.047	0.1	
7440-61-1	U-238	4.0 +/- 0.72	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.186	3.31	pCi/g	79.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-H22-0-1
Lab ID:	0812212-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 30-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.045	0.1	
15117-96-1	U-235	0.096 +/- 0.056	0.049	0.1	LT
7440-61-1	U-238	1.9 +/- 0.39	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.309	3.43	pCi/g	79.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-1-3	Sample Matrix: SOIL	Prep Batch: AS090220-2	Final Aliquot: 1.01 g
Lab ID: 0812212-15	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-2-1	Prep Basis: Dry Weight
	Date Collected: 30-Jul-08	Run ID: AS090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.062	0.1	
15117-96-1	U-235	0.055 +/- 0.044	0.055	0.1	U
7440-61-1	U-238	1.3 +/- 0.28	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.494	3.70	pCi/g	82.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-0-1	Sample Matrix: SOIL	Prep Batch: AS090220-2	Final Aliquot: 1.02 g
Lab ID: 0812212-16	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-2-1	Prep Basis: Dry Weight
	Date Collected: 04-Aug-08	Run ID: AS090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.045	0.1	
15117-96-1	U-235	0.12 +/- 0.059	0.018	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.423	3.86	pCi/g	87.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-1-3
Lab ID:	0812212-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.046	0.1	
15117-96-1	U-235	0.14 +/- 0.066	0.041	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.269	3.78	pCi/g	88.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita FMI-VRP


Work Order Number: 0812212

1. The following report consists of analytical results and supporting documentation for 17 soil samples received by ALS Paragon on 12/20/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812212-1, -3, -5, -9, -12, and -14 were sealed in steel cans on 12/30/08 and 01/02/09, respectively, and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/21/09 and 01/23/09 is at least 97.78%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.89%.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/26/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volume was insufficient to allow preparation of duplicates in batches GS090106-6 and GS090109-6. Duplicate analyses of samples 0812212-2 and -14 were performed in lieu of prepared duplicates.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples. This is applicable for samples 0812212-1, -3, -5, -9, -12, and -14.
7. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium. This is applicable for samples 0812212-1, -3, -5, -9, -12, and -14.

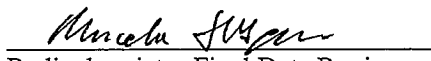


8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than (greater than for samples 0812212-2 and -2DUP) the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high (biased low for samples 0812212-2 and -2DUP) for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. The laboratory control sample associated with batch GS090106-3 was counted on 01/13/09 in detector 3. The observed dead time for this sample count was greater than 10%, at 10.63%. Analyst review of the raw data does not indicate any problems with the spectral acquisition for this sample. All data quality objectives were met and the results are submitted without further qualification. Please see QASS 360430.
11. The requested detection limit of 1.0 pCi/gram for ^{228}Ra was not met for many of the samples associated with this work order. The reported activities are greater than the achieved detection limits. The results have been flagged with a "M3" qualifier on the final reports. The results are submitted without further qualification.
12. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer

02/16/09
Date


Radiochemistry Final Data Reviewer

2-16-09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812212

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CS-JS-05-0-1	0812212-1		SOIL	27-Aug-08	13:28
CS-JS-05-1-3D	0812212-2		SOIL	27-Aug-08	13:28
CS-JS-06-0-1	0812212-3		SOIL	27-Aug-08	13:48
EM-JS-02-0-1	0812212-4		SOIL	01-Aug-08	9:17
EM-JS-01-0-1	0812212-5		SOIL	01-Aug-08	9:43
EM-JS-01-1-3	0812212-6		SOIL	01-Aug-08	9:43
EM-M26-0-1	0812212-7		SOIL	01-Aug-08	9:56
EM-M26-1-3	0812212-8		SOIL	01-Aug-08	9:56
EM-M26-5-7	0812212-9		SOIL	01-Aug-08	10:04
C-JS-01-0-1	0812212-10		SOIL	01-Aug-08	12:39
C-JS-01-1-3	0812212-11		SOIL	01-Aug-08	13:39
C-JS-02-1-3	0812212-12		SOIL	01-Aug-08	12:56
C-JS-02-5-7	0812212-13		SOIL	01-Aug-08	13:02
EM-H22-0-1	0812212-14		SOIL	30-Jul-08	9:37
EM-H22-1-3	0812212-15		SOIL	30-Jul-08	9:37
C-JS-03-0-1	0812212-16		SOIL	04-Aug-08	10:25
C-JS-03-1-3	0812212-17		SOIL	04-Aug-08	10:31



PARAGON ANALYTICS
ALS Paragon
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID **0812212**
Date: **12-17-08** Page **1** of **2**

Project Name/No.: **FMI-VRT** Sampler(s): **Steven Vaughn** Turnaround (circle one): **Standard** or **Rush** (Due **12-17-08**) Dispose: **60 day** or **Return to Client**

Report To: **Steven Vaughn**
Phone: **(520) 407-2845**
Fax: **(520) 407-2845**
E-mail: **steven.vaughn@ufscorp.com**
Company: **Freeport McMoran**
Address: **6200 W Duval Mine Rd.**
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCS		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Manganese Isotopes	
C5-J5-05-0-1	8/21/08	1328	1	S	n/a	1																														
C5-J5-05-1-3	8/21/08	1328	2	S	n/a	1																														
C6-J5-05-1-3 D	8/21/08	1328	3	S	n/a	1																														
C5-J5-06-0-1	8/21/08	1348	3	S	n/a	1																														
C5-J5-06-1-3	8/21/08	1353	3	S	n/a	1			KW																											
EM-J5-02-0-1	8/1/08	917	4	S	n/a	1																														
EM-J5-01-0-1	8/1/08	943	5	S	n/a	1																														
EM-J5-01-1-3	8/1/08	943	6	S	n/a	1																														
EM-M26-0-1	8/1/08	956	7	S	n/a	1																														
EM-M26-1-3	8/1/08	956	8	S	n/a	1																														

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: **Order No. 0508VT**

Relinquished By: (1) **Relinquished By:** (2)

Signature: **Kevin Walsh** Signature: _____
Printed Name: **Kevin Walsh** Printed Name: _____
Date: **12-17-08** Date: _____
Time: **1600** Time: _____
Company: **URS** Company: _____

Received By: (1) **Received By:** (2)

Signature: **Jana Orban** Signature: _____
Printed Name: **Jana Orban** Printed Name: _____
Date: **12/10/08** Date: _____
Time: **1000** Time: _____
Company: **ALS Paragon** Company: _____



PARAGON ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 480-1511 (970) 490-1522 Fax

LAB ID

0812212

Date:

Page 2 of 2

Project Name/No.: PM-VIP Sampler(s): K Walsh Turnaround (circle one): Standard or Rush (Due) Dispose? Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: steven.vaughn@irsorp.com
Company: Freight McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers
EM-M26-5-7	8/1/08	1004	9	S	n/a	1
C-JS-01-0-1	8/1/08	1239	10	S	n/a	1
C-JS-01-1-3	8/1/08	1239	11	S	n/a	1
C-JS-02-0-1	8/1/08	1256	✓	S	n/a	1
C-JS-02-1-3	8/1/08	1256	12	S	n/a	1
C-JS-02-5-7	8/1/08	1302	13	S	n/a	1
EM-H22-0-1	7/30/08	937	14	S	n/a	1
EM-H22-1-3	7/30/08	937	15	S	n/a	1
C-JS-03-0-1	8/4/08	1025	16	S	n/a	1
C-JS-03-1-3	8/4/08	1031	17	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 054807

Tik # 796202098941

Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K Walsh</u>	Signature <u> </u>	Signature <u> </u>	Signature <u> </u>
Printed Name <u>Kenneth Walsh</u>	Printed Name <u> </u>	Printed Name <u> </u>	Printed Name <u> </u>
Date <u>12-17-08</u>	Date <u> </u>	Date <u> </u>	Date <u> </u>
Time <u>1600</u>	Time <u> </u>	Time <u> </u>	Time <u> </u>
Company <u>URS</u>	Company <u> </u>	Company <u> </u>	Company <u> </u>
Received By: (1)		Received By: (2)	
Signature <u>Shawn Urban</u>	Signature <u> </u>	Signature <u> </u>	Signature <u> </u>
Printed Name <u>Shawn Urban</u>	Printed Name <u> </u>	Printed Name <u> </u>	Printed Name <u> </u>
Date <u>12/20/08</u>	Date <u> </u>	Date <u> </u>	Date <u> </u>
Time <u>1000</u>	Time <u> </u>	Time <u> </u>	Time <u> </u>
Company <u>ALS Paragon</u>	Company <u> </u>	Company <u> </u>	Company <u> </u>

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JMEWorkorder No: 0812212
Initials: LJO Date: 12/20/08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u> *
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u> NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u> •
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<u>NO</u> +
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: _____ < green pea _____ > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<u>RAD ONLY</u> YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Ambient</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>10</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

* Sample #9 (EM-M26-5-7) Sample time listed on ID label 1006.
 • Limited sample due to one 16oz WMG received for all tests (20 to 50% full)
 + Samples CS-JS-05-1-3 and C-JS-02-0-1 were received broken.
 Sample #2 (CS-JS-05-1-3D) Sample was received with a broken lid. Lid was replaced.

If applicable, was the client contacted? YES / NO / NA Contact: Rich Smith Date/Time: _____Project Manager Signature / Date: [Signature]

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705

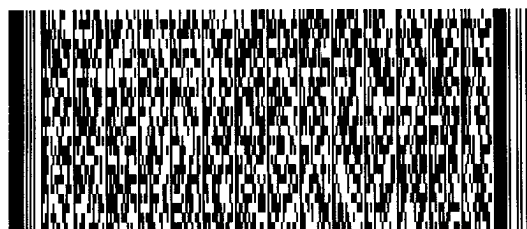


JCL511288/28/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 19DEC08
 ActWgt: 10.0 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

14
-1
0812212

2 of 5

MON - 22DEC

AA

MPS# 7962 0209 8941

0263

STANDARD OVERNIGHT

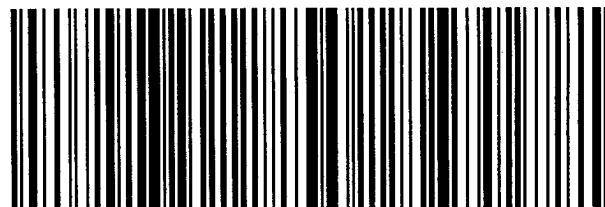
Mstr# 7971 9861 3710 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

QUALITY ASSURANCE SUMMARY SHEET

PAR W.O. # / BATCH

0812176, 177, 178, 212 /
65090106-3

TEST

5-SCAN

METHOD

5-SPEC

SOP/REV (PREP)

—

SOP/REV (ANAL)

713

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

MC
01/28/09

The laboratory control sample GS090106-3LCS was counted on 1/13/09 in detector 3. The observed dead time for the count of the laboratory control sample was greater than 10%, at 10.63%. During the spectral acquisition of this source, a high activity calibration source was counting in detector 4. This detector is in the same multi-channel buffer (MCB) as detector 3. Due to the nature of the electronics involved in gamma spectroscopy, any detector acquiring data within the same MCB is affected by all other detector inputs in that MCB. Thus, the source activity in detector 4 caused an increase in the dead time observed for the entire MCB containing detectors 3 and 4. Analyst review of the raw data does not indicate any problems with the spectral acquisition for these samples. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. All data quality objectives were met and the results are submitted without further qualification.

MC
01/28/09

MC
01/28/09

MC
01/28/09

MC
01/28/09

TECHNICIAN/ANALYST

DATE 01/28/09

DEPARTMENT MANAGER

DATE 1/28/09

1C108C360430

FORM 302r6.doc (4/22/04)

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 45 minutes

Final Aliquot: 94.1 g

Result Units: pCi/g

File Name: 090060d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.20 +/- 0.34	0.59	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.048 +/- 0.21	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090133d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.14 +/- 0.40	0.83	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6MB

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 191 g

Result Units: pCi/g

File Name: 090107d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.0088 +/- 0.18	0.34	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-6MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Final Aliquot: 84.5 g

Result Units: pCi/g

File Name: 090115d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.27 +/- 0.42	0.72	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 191 g

Result Units: pCi/g

File Name: 090107d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.16 +/- 0.32	0.57	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090067d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1020 +/- 120	14.2	986	103	85 - 115	P
10198-40-0	Co-60	454 +/- 53.2	1.41	457	99.3	85 - 115	P
10045-97-3	Cs-137	404 +/- 47.4	1.87	374	108	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812212-1

Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-6LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090080d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1070 +/- 126	10.6	986	108	85 - 115	P
10198-40-0	Co-60	464 +/- 54.4	1.35	456	102	85 - 115	P
10045-97-3	Cs-137	391 +/- 45.8	1.69	374	105	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812212-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090122d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	452 +/- 53.0	2.54	470	96.2	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-5LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Dec-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090076d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	467 +/- 55.3	7.35	462	101	85 - 115	P
10198-40-0	Co-60	208 +/- 24.4	0.792	214	97.3	85 - 115	P
10045-97-3	Cs-137	181 +/- 21.3	1.18	175	103	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812212-1

Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6ALCS

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090111d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	449 +/- 52.6	2.50	470	95.5	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-6LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Jan-09

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090112d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	475 +/- 56.3	7.11	462	103	85 - 115	P
10198-40-0	Co-60	209 +/- 24.6	0.818	213	98.0	85 - 115	P
10045-97-3	Cs-137	183 +/- 21.6	1.18	175	105	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812212-1

Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-0-1

Lab ID: 0812212-14DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d04A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.8 +/- 0.38	1.9 +/- 0.37	0.12	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-05-1-3D

Lab ID: 0812212-2DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 115 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d09

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.6 +/- 0.61	1.7 +/- 0.57	1.03	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

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Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-0-1
Lab ID: 0812212-14DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 30-Jul-08
Date Prepared: 02-Jan-09
Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 177 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090110d04

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.0 +/- 0.60	1.3 +/- 0.58	0.77	2.13	M3,G,TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-05-0-1

Lab ID: 0812212-1

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 212 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090121d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.37	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-05-0-1

Lab ID: 0812212-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 212 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090121d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.64	0.69	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-05-1-3D

Lab ID: 0812212-2

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 115 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090153d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.61	0.91	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

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Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-05-1-3D

Lab ID: 0812212-2DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 115 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.57	0.88	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-06-0-1

Lab ID: 0812212-3

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 216 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090106d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.33	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-06-0-1
Lab ID:	0812212-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 216 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090106d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.44	0.65	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-02-0-1

Lab ID: 0812212-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 85.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090105d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.7 +/- 0.96	1.5	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-01-0-1

Lab ID: 0812212-5

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 175 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090132d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.48	0.55	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-01-0-1

Lab ID: 0812212-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 175 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090132d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.60	1.2	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-01-1-3

Lab ID: 0812212-6

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090109d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.8 +/- 0.84	1.2	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-M26-0-1

Lab ID: 0812212-7

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090111d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.83	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-M26-1-3

Lab ID: 0812212-8

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090077d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.56	0.96	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-M26-5-7

Lab ID: 0812212-9

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 156 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090075d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.49	0.58	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-M26-5-7

Lab ID: 0812212-9

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 156 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090075d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.9 +/- 0.79	1.0	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-01-0-1
Lab ID:	0812212-10

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090112d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.77	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-01-1-3
Lab ID:	0812212-11

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 84.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.69	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-02-1-3
Lab ID:	0812212-12

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 172 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090164d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.41	0.42	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-02-1-3
Lab ID:	0812212-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 172 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090164d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.56	0.94	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-02-5-7
Lab ID:	0812212-13

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 70.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090113d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	5.2 +/- 1.2	1.3	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-H22-0-1
Lab ID:	0812212-14

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090157d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.38	0.53	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-0-1

Lab ID: 0812212-14DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.37	0.43	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

Page 2 of 3

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-H22-0-1
Lab ID:	0812212-14

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090157d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.60	0.90	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-0-1

Lab ID: 0812212-14DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.58	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

Page 3 of 3

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-H22-1-3

Lab ID: 0812212-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 30-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 86.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.0 +/- 0.63	0.82	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-0-1
Lab ID:	0812212-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090114d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.80	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-1-3
Lab ID:	0812212-17

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090024d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.69	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

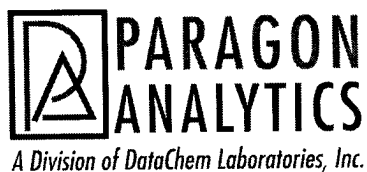
SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



March 20, 2009

Mr. Aaron Hilshorst
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-251
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Hilshorst:

Twenty-nine soil samples were received from Freeport McMoRan Sierrita on December 30, 2008. The samples were scheduled for the following analyses:

Isotopic Uranium	pages 1-52	Radium-228 by Method 9320	pages 1-10
Gamma Spectroscopy	pages 1-57	Radium-226 by EPA Method 903.1 (m)	pages 1-39

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,

ALS Paragon
Julie Ellingson
Project Manager

JME/eh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812251

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB04 60-80	0812251-1		SOIL	05-Oct-08	13:17
ST-SB01 180-200	0812251-2		SOIL	25-Sep-08	17:12
ST-SB04 40-60	0812251-3		SOIL	05-Oct-08	12:57
ST-SB01 100-120	0812251-4		SOIL	25-Sep-08	9:22
ST-SB01 120-140	0812251-5		SOIL	25-Sep-08	10:37
ST-SB01 80-100	0812251-6		SOIL	24-Sep-08	12:57
ST-SB01 160-180	0812251-7		SOIL	25-Sep-08	16:27
ST-SB04 0-20	0812251-8		SOIL	05-Oct-08	12:07
ST-SB04 80-100	0812251-9		SOIL	05-Oct-08	13:37
ST-SB03 200-210	0812251-10		SOIL	03-Oct-08	12:52
ST-SB04 20-40	0812251-11		SOIL	05-Oct-08	12:27
ST-SB06 180-200	0812251-12		SOIL	24-Oct-08	9:27
ST-SB06 200-220	0812251-13		SOIL	24-Oct-08	11:47
ET-SB02 20-40	0812251-14		SOIL	19-Sep-08	10:25
ST-SB06 0-20	0812251-15		SOIL	21-Oct-08	11:48
ST-SB06 140-160	0812251-16		SOIL	23-Oct-08	13:37
ET-SB02 60-80	0812251-17		SOIL	19-Sep-08	15:43
ET-SB02 80-100	0812251-18		SOIL	19-Sep-08	16:32
ST-SB01 20-40	0812251-19		SOIL	24-Sep-08	9:07
ST-SB06 40-60	0812251-20		SOIL	22-Oct-08	9:07
EM-JS-02-1-3	0812251-21		SOIL	01-Aug-08	9:17
ST-SB01 60-80	0812251-22		SOIL	24-Sep-08	11:07
ST-SB06 240-260	0812251-23		SOIL	25-Oct-08	10:12
OD-SD-05-1.5-3.0	0812251-24		SOIL	29-Jul-08	
CP-Q09-0-1	0812251-25		SOIL	23-Jul-08	
OD-JS-01-1-3	0812251-26		SOIL	29-Jul-08	
OD-JS-02-5-7	0812251-27		SOIL	29-Jul-08	
L70791-10	0812251-28		SOIL	28-Jul-08	
L70819-11	0812251-29		SOIL	29-Jul-08	

[illegible]

Project Name/No.: <u>FM1-VRP</u> Sampler(s): <u>K. Walsh</u> Turnaround (circle one) <u>Standard</u> or Rush (Due _____) Dispose: Date <u>60 days</u> or Return to Client _____	
Report To: <u>Steven Vaughn</u> Phone: <u>(520) 407-2845</u> Fax: _____ E-mail: <u>Steven.Vaughn@arscorp.com</u> Company: <u>Fleppert McMoran</u> Address: <u>6200 W Dardal Pine Rd</u> <u>Green Valley, AZ 85614</u>	
Circle method (right); provide additional information as needed (comments).	
Sample ID	Date Time * Lab ID Matrix Preservative (indicate type... HCL, etc.) No. of Containers
ST-SB04 20-40	10/5/08 1227 11 S W/A 1
ST-SB06 120-200	10/24/08 1927 12 S W/A 1
ST-SB06 260-280	10/26/08 0907 1 S W/A 1
ST-SB06 200-220	10/24/08 1147 13 S W/A 1
ET-SB02 20-40	9/19/08 1025 14 S W/A 1
ST-SB06 0-20	10/21/08 1148 15 S W/A 1
ST-SB06 140-160	10/23/08 1337 16 S W/A 1
ET-SB02 60-80	9/19/08 1543 17 S W/A 1
ET-SB02-80-100	9/19/08 1632 18 S W/A 1
ST-SB01-20-40	9/24/08 0907 19 S W/A 1
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter Comments:	
(1) Relinquished By: <u>K. Walsh</u> Signature _____ Printed Name <u>Kenn Walsh</u> Date <u>12-22-08</u> Time <u>1600</u> Company <u>URS</u>	
(2) Relinquished By: _____ Signature _____ Printed Name _____ Date _____ Time _____ Company _____	
(1) Received By: <u>Cheryl Trimble</u> Signature _____ Printed Name <u>Cheryl Trimble</u> Date <u>12-30-08</u> Time <u>1025</u> Company <u>ALS Paragon</u>	
(2) Received By: _____ Signature _____ Printed Name _____ Date _____ Time _____ Company _____	

Order No. 05088VT

Fedex 796210837788



PARAGON
ANALYTICALS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812251

Date: 12-22-08 Page 3 of 3

Project Name/No.: FM1-VRP Sampler(s): Kinkadee Turnaround (circle one): Standard or Rush (Due) Dispose: Date 60 day or Return to Client

Report To: Steven Vaughan
Phone: (520) 407-2845
Fax:
E-mail: Steven-Vaughan@uscorp.com
Company: Freepart McMoran
Address: 6200 W Durand Ave Rd.
Green Valley AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type.... HCL, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Sr-90 (Total RadioSr)	Gamma Isotopes	Radon 222	Mnium + 50tope	
ST-SB06 40-60	6/22/08	0907	20	S	n/a	1																														
EM-JS-02-1-3	8/1/08	917	21	S	n/a	1																														
ST-SB01-60-80	7/21/08	1107	22	S	n/a	1																														
ST-SB06 240-260	6/22/08	1012	23	S	n/a	1																														
OD-SD-05-15-30	7/21/08		24	S	n/a	1																														
CP-Q04-0-1	7/23/08		25	S	n/a	1																														
CP-SD-10-15-30	7/28/08			S	n/a	1																														
OD-JS-01-1-3	7/21/08		26	S	n/a	1																														
OD-JS-02-5-7	7/21/08		27	S	n/a	1																														
EM-C22-1-3	7/21/08			S	n/a	1																														

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 054887

Fedex 796210837788

Relinquished By:	Signature	Printed Name	Date	Time
(1)	Ken Ward	Ken Ward	12-22-08	1600
(2)				

Relinquished By:	Signature	Printed Name	Date	Time
(1)	Charles Trimble	Charles Trimble	12-30-08	1025
(2)				

Form 202r6.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812251Project Manager: JEInitials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	YES	<input checked="" type="radio"/> NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO <input type="radio"/> NA (If no. see Form 008.)		

Additional Information: 8-5-08 PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

☒ 28 L70791-10 Broken lids: 0812251-2 -16 no leakage detected
☒ 29 L70819-11 -3 -17
 post-it note ID's fell off and these are the -4 -18 All samples are limited volume.
 ID's on a label on the bag -5
 -9

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: _____

Project Manager Signature / Date: _____

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812251

Page 1 of 1

14

1

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL511288/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/NET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

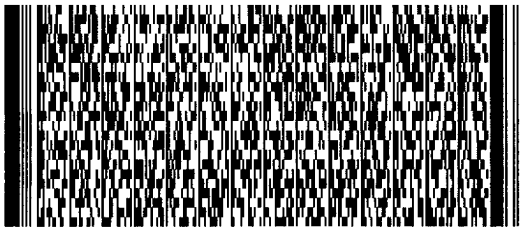
Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

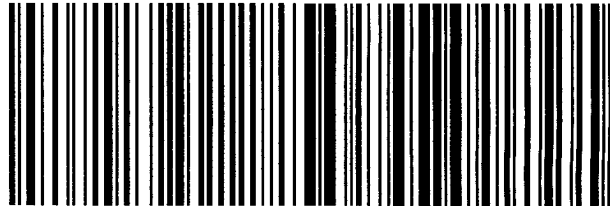


2 of 3
 MPS# 7962 1083 7788
 0263
 Mstr# 7962 1083 7711 0201

TUE - 30DEC AA
STANDARD OVERNIGHT

XH FTCA

80524
CO-US
DEN



After printing this label:

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3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

Freeport McMoRan Sierrita

FMI-VRP

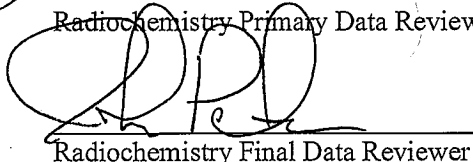
Work Order Number: 0812251

1. This report consists of the analytical results for 22 soil samples received by ALS Paragon on 12/30/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/11/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. The magnitude of the negative activity for method blank RE090220-5MB is greater than the 2 sigma TPU. The analyst's review of the data does not indicate a problem with the instrument data or the subsequent reporting systems. The data quality is not believed to be affected and the results are submitted without qualification. Under typical conditions, where background level sample data is normally distributed and analyzed by paired observations, this event is likely to occur at least 2.5% of the time.
5. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban

Radiochemistry Primary Data Reviewer


Radiochemistry Final Data Reviewer

03/16/09
Date

03/16/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812251

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB04 60-80	0812251-1		SOIL	05-Oct-08	13:17
ST-SB03 200-210	0812251-10		SOIL	03-Oct-08	12:52
ST-SB04 20-40	0812251-11		SOIL	05-Oct-08	12:27
ST-SB06 180-200	0812251-12		SOIL	24-Oct-08	9:27
ST-SB06 200-220	0812251-13		SOIL	24-Oct-08	11:47
ET-SB02 20-40	0812251-14		SOIL	19-Sep-08	10:25
ST-SB06 0-20	0812251-15		SOIL	21-Oct-08	11:48
ST-SB06 140-160	0812251-16		SOIL	23-Oct-08	13:37
ET-SB02 60-80	0812251-17		SOIL	19-Sep-08	15:43
ET-SB02 80-100	0812251-18		SOIL	19-Sep-08	16:32
ST-SB01 20-40	0812251-19		SOIL	24-Sep-08	9:07
ST-SB01 180-200	0812251-2		SOIL	25-Sep-08	17:12
ST-SB06 40-60	0812251-20		SOIL	22-Oct-08	9:07
EM-JS-02-1-3	0812251-21		SOIL	01-Aug-08	9:17
ST-SB01 60-80	0812251-22		SOIL	24-Sep-08	11:07
ST-SB06 240-260	0812251-23		SOIL	25-Oct-08	10:12
OD-SD-05-1.5-3.0	0812251-24		SOIL	29-Jul-08	
CP-Q09-0-1	0812251-25		SOIL	23-Jul-08	
OD-JS-01-1-3	0812251-26		SOIL	29-Jul-08	
OD-JS-02-5-7	0812251-27		SOIL	29-Jul-08	
L70791-10	0812251-28		SOIL	28-Jul-08	
L70819-11	0812251-29		SOIL	29-Jul-08	
ST-SB04 40-60	0812251-3		SOIL	05-Oct-08	12:57
ST-SB01 100-120	0812251-4		SOIL	25-Sep-08	9:22
ST-SB01 120-140	0812251-5		SOIL	25-Sep-08	10:37
ST-SB01 80-100	0812251-6		SOIL	24-Sep-08	12:57
ST-SB01 160-180	0812251-7		SOIL	25-Sep-08	16:27

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB04 0-20	0812251-8		SOIL	05-Oct-08	12:07
ST-SB04 80-100	0812251-9		SOIL	05-Oct-08	13:37

Project Name/No.: <u>FU1-URP</u> Sampler(s): <u>K. Walsh</u> Turnaround (circle one): <u>Standard</u> or Rush (Due <u>12-22-08</u>) Dispose: <u>Date today</u> or Return to Client <u>12-22-08</u>																																																																														
Report To: <u>Steven Vaughn</u> Phone: <u>(520) 907-2845</u> Fax: <u></u> E-mail: <u>steven_v Vaughn@arscorp.com</u> Company: <u>Freeport McMoran</u> Address: <u>6200 W Dardel Mile Rd</u> <u>Green Valley, AZ 85614</u>																																																																														
Circle method (right); provide additional information as needed (comments).																																																																														
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ST-SB06 200-220	10/24/08 1147																																																																													
ET-SB02 20-40	9/19/08 1055																																																																													
ST-SB06 0-20	10/21/08 1148																																																																													
ST-SB06 140-160	10/23/08 1337																																																																													
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ET-SB02 80-100	9/19/08 1632																																																																													
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* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter																																																																														
Comments: <u>Order No. 0508VT</u>																																																																														
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CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812251Project Manager: JEInitials: LOT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	YES	<input checked="" type="radio"/> NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO <input type="radio"/> NA (If no. see Form 008.)		

Additional Information: 8-5-08 PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

(28) L70791-10 Broken lids: 0812251-2 -16 no leakage detected
 (29) L70819-11 -3 -17
 post-it note ID's fell -4 -18 All samples are
 off and these are the -5 limited volume.
 ID's on a label on the bag -9

If applicable, was the client contacted? ☒ YES ☐ NO ☐ NA Contact: Rick Smith Date/Time: Project Manager Signature / Date:

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812251

Page 1 of 1

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111288/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code

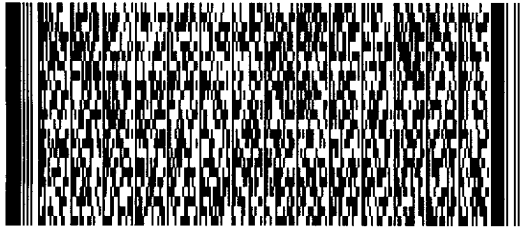


Ref # 24096838.54210.10013
 Invoice #
 PO #
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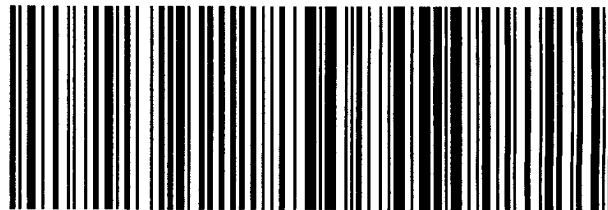


2 of 3
 MPS# 7962 1083 7788
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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-4MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.12 +/- 0.20	0.42	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812251-1

Date Printed: Saturday, March 14, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-5MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.26 +/- 0.23	0.48	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812251-1

Date Printed: Saturday, March 14, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-4LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	44.3 +/- 8.18	0.223	42.8	104	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812251-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-5LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	50.8 +/- 9.25	0.522	42.9	118	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812251-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 240-260

Lab ID: 0812251-23MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 25-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	34.5	1.4	0.265	43.4	76.2	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812251-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 80-100

Lab ID: 0812251-6DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 24-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.5 +/- 0.50	1.5 +/- 0.57	0.10	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 60-80

Lab ID: 0812251-17DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 19-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.1 +/- 0.38	1.2 +/- 0.45	0.32	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 100-120
Lab ID:	0812251-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.69	0.71	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 120-140
Lab ID:	0812251-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.8 +/- 1.1	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 80-100
Lab ID:	0812251-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.50	0.34	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 80-100
Lab ID:	0812251-6DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 24-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4

QCBatchID: RE090220-4-1

Run ID: RE090220-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.57	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812251-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 160-180
Lab ID:	0812251-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.76 +/- 0.30	0.17	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB03 200-210
Lab ID:	0812251-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 03-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.55	0.64	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB04 20-40	Sample Matrix: SOIL	Prep Batch: RE090220-4	Final Aliquot: 1.04 g
Lab ID: 0812251-11	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-4-1	Prep Basis: Dry Weight
	Date Collected: 05-Oct-08	Run ID: RE090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 05-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.59	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 180-200	Sample Matrix: SOIL	Prep Batch: RE090220-4	Final Aliquot: 1.08 g
Lab ID: 0812251-12	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-4-1	Prep Basis: Dry Weight
	Date Collected: 24-Oct-08	Run ID: RE090220-4A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 05-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.47	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 20-40	Sample Matrix: SOIL	Prep Batch: RE090220-5	Final Aliquot: 1.08 g
Lab ID: 0812251-14	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-5-1	Prep Basis: Dry Weight
	Date Collected: 19-Sep-08	Run ID: RE090220-5A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 05-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.75	0.099	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 0-20	Sample Matrix: SOIL	Prep Batch: RE090220-5	Final Aliquot: 1.08 g
Lab ID: 0812251-15	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-5-1	Prep Basis: Dry Weight
	Date Collected: 21-Oct-08	Run ID: RE090220-5A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 05-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.69	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 140-160	Sample Matrix: SOIL	Prep Batch: RE090220-5	Final Aliquot: 1.02 g
Lab ID: 0812251-16	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-5-1	Prep Basis: Dry Weight
	Date Collected: 23-Oct-08	Run ID: RE090220-5A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 05-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.53	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ET-SB02 60-80
Lab ID:	0812251-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.38	0.30	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 60-80
Lab ID:	0812251-17DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 19-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.45	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 80-100	Sample Matrix: SOIL	Prep Batch: RE090220-5	Final Aliquot: 1.01 g
Lab ID: 0812251-18	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-5-1	Prep Basis: Dry Weight
	Date Collected: 19-Sep-08	Run ID: RE090220-5A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 05-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.41	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 20-40
Lab ID:	0812251-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.54	0.30	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-02-1-3
Lab ID:	0812251-21

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.81	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 60-80
Lab ID:	0812251-22

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.66	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 240-260
Lab ID:	0812251-23

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.48	0.36	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-05-1.5-3.0	Sample Matrix: SOIL	Prep Batch: RE090220-5	Final Aliquot: 1.08 g
Lab ID: 0812251-24	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-5-1	Prep Basis: Dry Weight
	Date Collected: 29-Jul-08	Run ID: RE090220-5A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 11-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.68	0.77	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-Q09-0-1
Lab ID:	0812251-25

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.64 +/- 0.54	0.82	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-JS-01-1-3
Lab ID:	0812251-26

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.46	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-JS-02-5-7
Lab ID:	0812251-27

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.60	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: L70791-10	Sample Matrix: SOIL	Prep Batch: RE090220-5	Final Aliquot: 1.04 g
Lab ID: 0812251-28	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-5-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: RE090220-5A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 11-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.61 +/- 0.40	0.58	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	L70819-11
Lab ID:	0812251-29

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.73	0.76	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

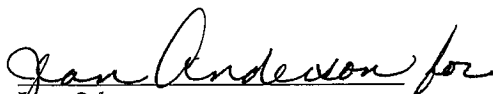
Freeport McMoRan Sierrita

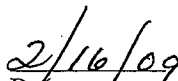
FMI-VRP

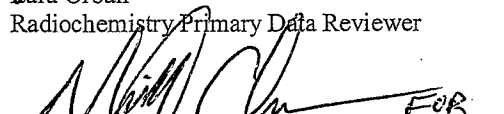
Work Order Number: 0812251

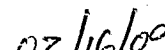
1. This report consists of the analytical results for one soil sample received by ALS Paragon on 12/30/08.
2. This sample was prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in this sample.
3. The sample was analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analysis was completed on 01/29/09.
4. The analysis results for this sample are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil sample from this work order was initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. No further anomalous situations were noted during the preparation and analysis of this sample. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer


Date 2/16/09


Radiochemistry Final Data Reviewer FOR JOHN
PETROVIC


Date 02/16/09

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812251

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB04 60-80	0812251-1		SOIL	05-Oct-08	13:17
ST-SB01 180-200	0812251-2		SOIL	25-Sep-08	17:12
ST-SB04 40-60	0812251-3		SOIL	05-Oct-08	12:57
ST-SB01 100-120	0812251-4		SOIL	25-Sep-08	9:22
ST-SB01 120-140	0812251-5		SOIL	25-Sep-08	10:37
ST-SB01 80-100	0812251-6		SOIL	24-Sep-08	12:57
ST-SB01 160-180	0812251-7		SOIL	25-Sep-08	16:27
ST-SB04 0-20	0812251-8		SOIL	05-Oct-08	12:07
ST-SB04 80-100	0812251-9		SOIL	05-Oct-08	13:37
ST-SB03 200-210	0812251-10		SOIL	03-Oct-08	12:52
ST-SB04 20-40	0812251-11		SOIL	05-Oct-08	12:27
ST-SB06 180-200	0812251-12		SOIL	24-Oct-08	9:27
ST-SB06 200-220	0812251-13		SOIL	24-Oct-08	11:47
ET-SB02 20-40	0812251-14		SOIL	19-Sep-08	10:25
ST-SB06 0-20	0812251-15		SOIL	21-Oct-08	11:48
ST-SB06 140-160	0812251-16		SOIL	23-Oct-08	13:37
ET-SB02 60-80	0812251-17		SOIL	19-Sep-08	15:43
ET-SB02 80-100	0812251-18		SOIL	19-Sep-08	16:32
ST-SB01 20-40	0812251-19		SOIL	24-Sep-08	9:07
ST-SB06 40-60	0812251-20		SOIL	22-Oct-08	9:07
EM-JS-02-1-3	0812251-21		SOIL	01-Aug-08	9:17
ST-SB01 60-80	0812251-22		SOIL	24-Sep-08	11:07
ST-SB06 240-260	0812251-23		SOIL	25-Oct-08	10:12
OD-SD-05-1.5-3.0	0812251-24		SOIL	29-Jul-08	
CP-Q09-0-1	0812251-25		SOIL	23-Jul-08	
OD-JS-01-1-3	0812251-26		SOIL	29-Jul-08	
OD-JS-02-5-7	0812251-27		SOIL	29-Jul-08	
L70791-10	0812251-28		SOIL	28-Jul-08	
L70819-11	0812251-29		SOIL	29-Jul-08	



Project Name/No.: FU1-URP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due 12-22-08) Dispose: Date today or Return to Client 12-22-08	
Report To: Steven Vaughn Phone: (520) 907-2845 Fax: E-mail: steven_v Vaughn@urcorp.com Company: Freeport McMoran Address: 6200 W Dardel Mine Rd Green Valley, AZ 85614	
Circle method (right); provide additional information as needed (comments).	
Sample ID	Date Time *
ST-SB04 20-40	10/5/08 1227
ST-SB06 120-200	10/24/08 1927
ST-SB06 260-280	10/26/08 0907
ST-SB06 200-220	10/24/08 1147
ET-SB02 20-40	9/19/08 1055
ST-SB06 0-20	10/21/08 1148
ST-SB06 140-160	10/23/08 1337
ET-SB02 60-80	9/19/08 1543
ET-SB02 80-100	9/19/08 1632
ST-SB01-20-40	9/24/08 0907
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter	
Comments: Order No. 0508VT Felex 796210837788	
Relinquished By: K. Walsh Signature Printed Name Date 12-22-08 Time 1600 Company URS	Relinquished By: Cheryl Trimble Signature Printed Name Date 12-30-08 Time 1035 Company ALS Paragon
Form 202r6.xls (6/16/06)	



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812251

Date: 12-22-08 Page 3 of 3

Project Name/No.: FMT-VRP	Sampler(s): Kildale	Turnaround (circle one): Standard	or Rush (Due)	Dispose: Date 60 day	or Return to Client																																									
Report To: Steven Vaughan Phone: (520) 407-2845 Fax: E-mail: Steven_vanugh@curiscorp.com Company: Freeport McMoran Address: 6200 W Durnal Pkwy Rd. Green Valley, AZ 85614	Circle method (right); provide additional information as needed (comments).	Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers	VOCS	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	PH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Aluminum isotopes 234, 235, 238

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 050887

Fedex 796210837788

Relinquished By: (1) Signature: Ken L... Printed Name: Ken L... Date: 12-22-08 Time: 1600 Company: URS

Relinquished By: (2) Signature: ... Printed Name: ... Date: ... Time: ... Company: ...

Received By: (1) Signature: Cheryl Trimble Printed Name: Cheryl Trimble Date: 12-30-08 Time: 1025 Company: ALS Paragon

Received By: (2) Signature: ... Printed Name: ... Date: ... Time: ... Company: ...

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812251Project Manager: JEInitials: LOT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	YES	<input checked="" type="radio"/> NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO <input type="radio"/> NA (If no. see Form 008.)		

Additional Information: 8-5-08 PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

(28) L70791-10 Broken lids: 0812251-2 -16 no leakage detected
 (29) L70819-11 -3 -17
 post-it note ID's fell -4 -18 All samples are
 off and these are the -5 limited volume.
 ID's on a label on the bag -9

If applicable, was the client contacted? ☒ YES ☐ NO ☐ NA Contact: Rick Smith Date/Time: Project Manager Signature / Date:

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812251

Page 1 of 1

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111288/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code

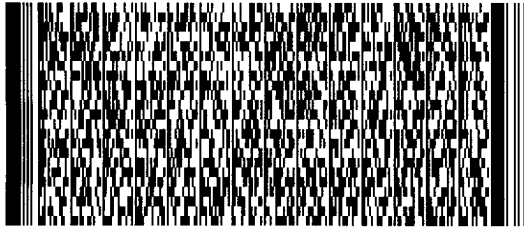


Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524



2 of 3

TUE - 30DEC

AA

MPS# 7962 1083 7788
 0263

STANDARD OVERNIGHT

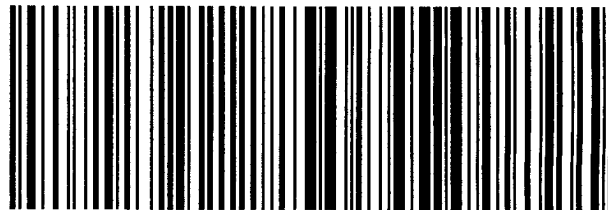
Mstr# 7962 1083 7711 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812251-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812251-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Field ID:	EM-JS-02-1-3
Lab ID:	0812251-21

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 01-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.500 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.0 +/- 1.7	2.3	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36670	32100	ug	87.5	40 - 110 %	
YTTRIUM	8713	5990	ug	68.7	40 - 110 %	
Total				60.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812251-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812251

1. This report consists of the analytical results for 29 soil samples received by ALS Paragon on 12/30/2008.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to potential matrix interference, the samples were prepared at a reduced aliquot of ~1 gram.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 03/07/2009.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. Sample 0812251-27 has a chemical recovery of 14.6%, below the 30% lower control limit. Spectral quality is adequate for accurate quantification. All remaining quality control criteria have been met. This sample is flagged with an "Y2" flag on the final reports. Please refer to NCR #11236.
7. Uranium-234 and U-238 activity is reported in method blank AS090220-3MB and U-234 activity is reported in method blank AS090223-1MB above the minimum detectable concentration value. The measured blank activity is below the requested MDC of 0.1 pCi/g. Results are acceptable according to SOP715R15, and are submitted without further qualification.

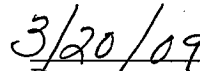


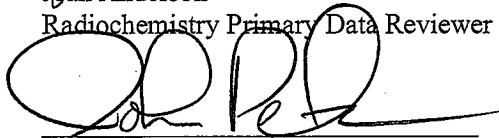
8. The requested MDC of 0.1 pCi/gram was not met for U-238 for samples 0812251-25 and -27. The reported activity for these samples is greater than the achieved MDC. These samples are identified with an "M3" flag on the final reports.
9. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

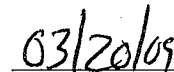


Jean Anderson
Radiochemistry Primary Data Reviewer


Date



Radiochemistry Final Data Reviewer


Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812251

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB04 60-80	0812251-1		SOIL	05-Oct-08	13:17
ST-SB01 180-200	0812251-2		SOIL	25-Sep-08	17:12
ST-SB04 40-60	0812251-3		SOIL	05-Oct-08	12:57
ST-SB01 100-120	0812251-4		SOIL	25-Sep-08	9:22
ST-SB01 120-140	0812251-5		SOIL	25-Sep-08	10:37
ST-SB01 80-100	0812251-6		SOIL	24-Sep-08	12:57
ST-SB01 160-180	0812251-7		SOIL	25-Sep-08	16:27
ST-SB04 0-20	0812251-8		SOIL	05-Oct-08	12:07
ST-SB04 80-100	0812251-9		SOIL	05-Oct-08	13:37
ST-SB03 200-210	0812251-10		SOIL	03-Oct-08	12:52
ST-SB04 20-40	0812251-11		SOIL	05-Oct-08	12:27
ST-SB06 180-200	0812251-12		SOIL	24-Oct-08	9:27
ST-SB06 200-220	0812251-13		SOIL	24-Oct-08	11:47
ET-SB02 20-40	0812251-14		SOIL	19-Sep-08	10:25
ST-SB06 0-20	0812251-15		SOIL	21-Oct-08	11:48
ST-SB06 140-160	0812251-16		SOIL	23-Oct-08	13:37
ET-SB02 60-80	0812251-17		SOIL	19-Sep-08	15:43
ET-SB02 80-100	0812251-18		SOIL	19-Sep-08	16:32
ST-SB01 20-40	0812251-19		SOIL	24-Sep-08	9:07
ST-SB06 40-60	0812251-20		SOIL	22-Oct-08	9:07
EM-JS-02-1-3	0812251-21		SOIL	01-Aug-08	9:17
ST-SB01 60-80	0812251-22		SOIL	24-Sep-08	11:07
ST-SB06 240-260	0812251-23		SOIL	25-Oct-08	10:12
OD-SD-05-1.5-3.0	0812251-24		SOIL	29-Jul-08	
CP-Q09-0-1	0812251-25		SOIL	23-Jul-08	
OD-JS-01-1-3	0812251-26		SOIL	29-Jul-08	
OD-JS-02-5-7	0812251-27		SOIL	29-Jul-08	
L70791-10	0812251-28		SOIL	28-Jul-08	
L70819-11	0812251-29		SOIL	29-Jul-08	

Project Name/No.: Fill-VRP Sampler(s): K-Walsh Turnaround (circle one): Standard or Rush (Due _____) Dispose/Date Safety or Return to Client					
Report To: Steven Vaughn Corp. Phone: (520) 407-2845 Fax: E-mail: steven_v@vaughncorp.com Company: Freeport McMoran Address: 6200 W Duval Mine Rd. Green Valley, AZ 85614					
Sample ID	Date	Time *	Lab ID	Matrix	No. of Containers (Indicate type... HCl, etc.)
ST-SB04 60-80	9/5/08	1317	①	S	n/a
ST-SB01 180-200	9/5/08	1712	②	S	n/a
ST-SB04 40-60	9/5/08	1257	③	S	n/a
ST-SB01 100-120	9/5/08	922	④	S	n/a
ST-SB01 120-140	9/5/08	1037	⑤	S	n/a
ST-SB01 80-100	9/5/08	1257	⑥	S	n/a
ST-SB01 160-180	9/5/08	1627	⑦	S	n/a
ST-SB04 0-20	9/5/08	1207	⑧	S	n/a
ST-SB04 80-100	9/5/08	1337	⑨	S	n/a
ST-SB03 200-210	9/5/08	1252	⑩	S	n/a

Circle method (right); provide additional information as needed (comments).	
VOCs	No. of Containers
SWB2608	
BTEX (only)	
SVOCs	
OC Pesticides	
PCBs	
Herbicides	
Explosives	
TCLP Organics SW1311	
SWB2608 B270C B081A B151A	
TCMP Metals SW1311 Hg	
SWB010B 7470 E200.7	
Total Metals by ICP Hg	
SWB010B 7470 E200.7	
Dissolved Metals by ICP Hg	
SWB010B 7470 E200.7	
Total Metals by ICP/MMS	
SWB020A E200.8	
Dissolved Metals by ICP/MMS	
SWB020A E200.8	
Hexavalent Chromium	
SW7196A Alkaline Digest? Y / N	
Inorganic Anions	
SW9056 E300.0 (specify in comments)	
Solids:	
Total E160.3 TDS E160.1 TSS E160.2	
pH	
SW9040B SW9045C	
TPH	
SWB015B GRO DRO (circle one or both)	
Gross Alpha / Beta	
SW9310 E900.0	
Actinides by Paragon SOP	
Pu / U / Am / Th / Cm /	
Tritium	
E906.0	
Total Alpha-Emitting Radium	
SW9315 E903.0	
Radium 226	
E903.1	
Radium 228	
SW9320 E904.0	
Strontium 90 (Total RadioSr)	
D5811-00	
Gamma Isotopes	
E901.1	
Radon 222	
SM7510Rn	
Maximum Isotopes 234, 235, 238	

(1) Relinquished By:		(2) Relinquished By:	
Signature	Printed Name	Signature	Printed Name
Ken Walsh	Kenneth Walsh		
Date 12-22-08	Time 1600		
Company MRS			

(1) Received By:		(2) Received By:	
Signature	Printed Name	Signature	Printed Name
Cheryl Trimble	Cheryl Trimble		
Date 12-30-08	Time 1025		
Company ALS Paragon			

Order No. 0548VT

Fedex 796210837788

Comments: Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter



Project Name/No.: <u>FU1-URP</u> Sampler(s): <u>K. Walsh</u> Turnaround (circle one): <u>Standard</u> or Rush (Due <u>12-22-08</u>) Dispose: <u>Date today</u> or Return to Client <u>12-22-08</u>	
Report To: <u>Steven Vaughn</u> Phone: <u>(520) 907-2845</u> Fax: <u></u> E-mail: <u>steven_v Vaughn@arscorp.com</u> Company: <u>Freeport McMoran</u> Address: <u>6200 W Dardel Mile Rd</u> <u>Green Valley, AZ 85614</u>	
Circle method (right); provide additional information as needed (comments).	
Sample ID	Date Time
ST-SB04 20-40	10/5/08 1227
ST-SB06 120-200	10/24/08 1927
ST-SB06 260-280	10/26/08 0907
ST-SB06 200-220	10/24/08 1147
ET-SB02 20-40	9/19/08 1055
ST-SB06 0-20	10/21/08 1148
ST-SB06 140-160	10/23/08 1337
ET-SB02 60-80	9/19/08 1543
ET-SB02 80-100	9/19/08 1632
ST-SB01-20-40	9/24/08 0907
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter Comments: <u>Order No. 0508VT</u> <u>Felex 796210837788</u>	
VOCs BTEX (only) SVOCs OC Pesticides PCBs Herbicides Explosives TCLP Organics SW1311 TCLP Metals SW1311 Hg Total Metals by ICP Hg Dissolved Metals by ICP Hg Total Metals by ICP/MS Dissolved Metals by ICP/MS Hexavalent Chromium Inorganic Anions Solids: pH TPH Gross Alpha / Beta Actinides by Paragon SOP Tritium Total Alpha-Emitting Radium Radium 226 Radium 228 Strontium 90 (Total RadioSr) Gamma Isotopes Radon 222	SW8260B SW8021B SW8270C SW8081A SW8082 SW8151A SW8330 SW8260B 8270C 8081A 8151A SW6010B 7470 SW6010B 7470 7471 E200.7 SW6010B 7470 E200.7 SW6020A E200.8 SW6020A E200.8 SW7196A Alkaline Digest? Y / N SW9056 E300.0 (specify in comments) Total E160.3 TDS E160.1 TSS E160.2 SW9040B SW9045C SW8015B GRO DRO (circle one or both) SW9310 E900.0 Pu / U / Am / Th / Cm / E906.0 SW9315 E903.0 E903.1 SW9320 E904.0 D5811-00 E901.1 SM7510Rn Radon 222
No. of Containers Preservative Matrix Lab ID	1 W/A S 11 1 W/A S 12 1 W/A S 13 1 W/A S 14 1 W/A S 15 1 W/A S 16 1 W/A S 17 1 W/A S 18 1 W/A S 19 1 W/A S 20
Relinquished By: <u>K. Walsh</u> Signature: <u>K. Walsh</u> Printed Name: <u>K. Walsh</u> Date: <u>12-22-08</u> Time: <u>1600</u> Company: <u>URS</u> Received By: <u>Cheryl Trimble</u> Signature: <u>Cheryl Trimble</u> Printed Name: <u>Cheryl Trimble</u> Date: <u>12-30-08</u> Time: <u>1035</u> Company: <u>ALS Paragon</u>	



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812251

Date: 12-22-08 Page 3 of 3

Project Name/No.: FMT-VRP	Sampler(s): Kildale	Turnaround (circle one): Standard	or Rush (Due)	Dispose: Date 60 day	or Return to Client																																										
Report To: Steven Vaughan Phone: (520) 407-2845 Fax: E-mail: Steven_van@cursecorp.com Company: Freeport McMoran Address: 6200 W Durnal Pkwy Rd. Green Valley, AZ 85614	Circle method (right); provide additional information as needed (comments).	Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers	VOCS	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	PH	TPH	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Aluminum isotopes 234, 235, 238

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:
Order No. 050887
Fedex 796210837788

Relinquished By: (1) Signature: Ken W. W. Printed Name: Ken W. W. Date: 12-22-08 Time: 1600 Company: URS
(2) Signature: Received By: Signature: Cheryl Trimble Printed Name: Cheryl Trimble Date: 12-30-08 Time: 1025 Company: ALS Paragon

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812251Project Manager: JEInitials: LOT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	YES	<input checked="" type="radio"/> NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO <input type="radio"/> NA (If no. see Form 008.)		

Additional Information: 8-5-08 PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

(28) L70791-10 Broken lids: 0812251-2 -16 no leakage detected
 (29) L70819-11 -3 -17
 post-it note ID's fell -4 -18 All samples are
 off and these are the -5 limited volume.
 ID's on a label on the bag -9

If applicable, was the client contacted? ☒ YES ☐ NO ☐ NA Contact: Rick Smith Date/Time: Project Manager Signature / Date:

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812251

Page 1 of 1

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111288/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code

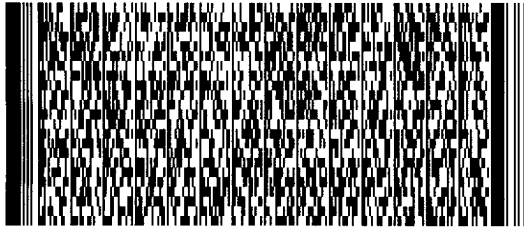


Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524



2 of 3

TUE - 30DEC

AA

MPS# 7962 1083 7788
 0263

STANDARD OVERNIGHT

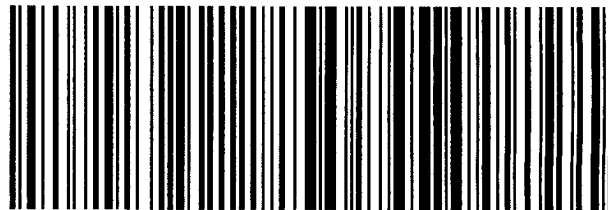
Mstr# 7962 1083 7711 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



CONTROLLED NON-CONFORMANCE REPORT

Non-Conformance

Initiated By: Erin M. Finsley on 3/12/2009

Event Type: Lab QC Criteria Not Met -- Chemical Yield

Event Explanation: Sample 0812251-27 has a chemical yield below the LCL of 30% at 14.6%. Spectral quality is adequate for accurate quantification. All remaining quality control criteria have been met.

Action To

Prevent Recurrence: discussion with prep lab supervisor

Corrective Action

Corrective Action: Document in Narrative

Department Manager Approval: Renee Gallegos

Approval Date: 3/19/2009

Corrective Action Comments:

Workorders Affected

Workorder -- Procedure

0812251 -- UIISO

Rick Smith was contacted on 3/17/2009

Approved By

Julie Ellingson

Approval Date

3/19/2009

Associated Batches

The samples were originally associated with the following Batch(es):

AS090223-1A created on 3/12/2009

All rework was completed in the following Batch(es):

Not Applicable

NCR Approval

Project Manager Approval: JME on 3/19/2009

Department Manager Approval: Renee Gallegos on 3/19/2009

QA Manager Approval: Renee Gallegos on 3/19/2009

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090220-2MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Final Aliquot: 1.03 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.010 +/- 0.021	0.044	0.1	U
15117-96-1	U-235	-0.0020 +/- 0.024	0.035	0.1	U
7440-61-1	U-238	0.0045 +/- 0.020	0.044	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.376	3.61	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812251-1

Date Printed: Friday, March 20, 2009

ALS Paragon
LIMS Version: 6.252A

Page 2 of 3

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090220-3MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.076 +/- 0.048	0.045	0.1	B3
15117-96-1	U-235	0.0052 +/- 0.027	0.039	0.1	U
7440-61-1	U-238	0.057 +/- 0.039	0.017	0.1	B3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.343	3.24	pCi/g	74.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090223-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Feb-09

Date Prepared: 23-Feb-09

Date Analyzed: 07-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 1000 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.0067 +/- 0.0083	0.0052	0.1	B3
15117-96-1	U-235	0.0040 +/- 0.0097	0.0054	0.1	U
7440-61-1	U-238	0.010 +/- 0.0096	0.012	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.331	3.43	pCi/g	79.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090220-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Final Aliquot: 1.03 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.22 +/- 0.761	0.0296	4.20	100	82 - 122	P
7440-61-1	U-238	4.54 +/- 0.814	0.0355	4.37	104	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.376	3.57	pCi/g	81.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812251-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

Page 1 of 3

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090220-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.31 +/- 0.797	0.0579	4.17	103	82 - 122	P
7440-61-1	U-238	4.05 +/- 0.753	0.0723	4.33	93.5	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.343	3.36	pCi/g	77.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812251-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

Page 2 of 3

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090223-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Feb-09

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.05 +/- 0.742	0.0533	4.16	97.4	82 - 122	P
7440-61-1	U-238	4.28 +/- 0.779	0.0687	4.32	98.9	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.331	3.63	pCi/g	83.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812251-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

Page 3 of 3

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 40-60

Lab ID: 0812251-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.9 +/- 0.56	1.9 +/- 0.38	1.40	2.13	
15117-96-1	U-235	0.20 +/- 0.090	0.15 +/- 0.069	0.47	2.13	
7440-61-1	U-238	2.7 +/- 0.53	2.0 +/- 0.39	1.09	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 180-200

Lab ID: 0812251-12DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.6 +/- 0.34	1.5 +/- 0.31	0.31	2.13	
15117-96-1	U-235	0.095 +/- 0.060	0.12 +/- 0.063	0.23	2.13	
7440-61-1	U-238	1.7 +/- 0.35	1.5 +/- 0.32	0.28	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-02-1-3
Lab ID: 0812251-21DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	4.5 +/- 0.82	4.3 +/- 0.78	0.17	2.13	
15117-96-1	U-235	0.20 +/- 0.085	0.19 +/- 0.079	0.12	2.13	
7440-61-1	U-238	4.4 +/- 0.81	4.3 +/- 0.79	0.06	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
DER - Duplicate Error Ratio (see PAI SOP 715)
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-01-1-3
Lab ID: 0812251-26DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 23-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.3 +/- 0.47	2.0 +/- 0.42	0.42	2.13	
15117-96-1	U-235	0.17 +/- 0.084	0.11 +/- 0.067	0.54	2.13	
7440-61-1	U-238	2.0 +/- 0.42	2.3 +/- 0.47	0.55	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 60-80	Sample Matrix: SOIL	Prep Batch: AS090220-3	Final Aliquot: 1.06 g
Lab ID: 0812251-1	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-3-1	Prep Basis: Dry Weight
	Date Collected: 05-Oct-08	Run ID: as090220-3x	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 26-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.037	0.1	
15117-96-1	U-235	0.13 +/- 0.060	0.039	0.1	
7440-61-1	U-238	1.9 +/- 0.37	0.033	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.281	3.96	pCi/g	92.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 180-200
Lab ID:	0812251-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.045	0.1	
15117-96-1	U-235	0.20 +/- 0.085	0.039	0.1	
7440-61-1	U-238	1.6 +/- 0.34	0.017	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.488	3.47	pCi/g	77.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 40-60
Lab ID:	0812251-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.56	0.059	0.1	
15117-96-1	U-235	0.20 +/- 0.090	0.070	0.1	
7440-61-1	U-238	2.7 +/- 0.53	0.074	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.356	3.30	pCi/g	75.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 40-60

Lab ID: 0812251-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.036	0.1	
15117-96-1	U-235	0.15 +/- 0.069	0.035	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.219	3.43	pCi/g	81.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 100-120	Sample Matrix: SOIL	Prep Batch: AS090220-3	Final Aliquot: 1.09 g
Lab ID: 0812251-4	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-3-1	Prep Basis: Dry Weight
	Date Collected: 25-Sep-08	Run ID: as090220-3x	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 26-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.059	0.1	
15117-96-1	U-235	0.18 +/- 0.075	0.039	0.1	
7440-61-1	U-238	2.0 +/- 0.38	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.158	3.40	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 120-140
Lab ID:	0812251-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.46	0.065	0.1	
15117-96-1	U-235	0.11 +/- 0.069	0.065	0.1	
7440-61-1	U-238	2.3 +/- 0.48	0.055	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.354	2.74	pCi/g	62.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 80-100
Lab ID:	0812251-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.051	0.1	
15117-96-1	U-235	0.11 +/- 0.060	0.060	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.059	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.427	3.78	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 160-180
Lab ID:	0812251-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.041	0.1	
15117-96-1	U-235	0.12 +/- 0.061	0.043	0.1	
7440-61-1	U-238	1.5 +/- 0.30	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.379	3.76	pCi/g	85.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 0-20
Lab ID:	0812251-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.047	0.1	
15117-96-1	U-235	0.25 +/- 0.099	0.041	0.1	
7440-61-1	U-238	2.4 +/- 0.48	0.018	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.381	3.14	pCi/g	71.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 80-100
Lab ID:	0812251-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.054	0.1	
15117-96-1	U-235	0.17 +/- 0.078	0.063	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.067	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.324	3.60	pCi/g	83.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 200-210	Sample Matrix: SOIL	Prep Batch: AS090220-3	Final Aliquot: 1.05 g
Lab ID: 0812251-10	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-3-1	Prep Basis: Dry Weight
	Date Collected: 03-Oct-08	Run ID: as090220-3x	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 26-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.1 +/- 0.25	0.041	0.1	
15117-96-1	U-235	0.090 +/- 0.056	0.041	0.1	LT
7440-61-1	U-238	1.3 +/- 0.28	0.051	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.289	3.05	pCi/g	71.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 20-40
Lab ID:	0812251-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.062	0.1	
15117-96-1	U-235	0.21 +/- 0.082	0.041	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.198	3.29	pCi/g	78.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 180-200
Lab ID:	0812251-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.34	0.046	0.1	
15117-96-1	U-235	0.095 +/- 0.060	0.064	0.1	LT
7440-61-1	U-238	1.7 +/- 0.35	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.381	3.43	pCi/g	78.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 180-200

Lab ID: 0812251-12DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.071	0.1	
15117-96-1	U-235	0.12 +/- 0.063	0.059	0.1	
7440-61-1	U-238	1.5 +/- 0.32	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.317	3.35	pCi/g	77.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 200-220
Lab ID:	0812251-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.039	0.1	
15117-96-1	U-235	0.13 +/- 0.066	0.046	0.1	
7440-61-1	U-238	1.6 +/- 0.33	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.439	3.57	pCi/g	80.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 20-40
Lab ID:	0812251-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.042	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.043	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.411	3.81	pCi/g	86.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 0-20
Lab ID:	0812251-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 21-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.060	0.1	
15117-96-1	U-235	0.044 +/- 0.039	0.051	0.1	U
7440-61-1	U-238	1.5 +/- 0.31	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.233	3.39	pCi/g	80.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 140-160	Sample Matrix: SOIL	Prep Batch: AS090220-3	Final Aliquot: 1.05 g
Lab ID: 0812251-16	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-3-1	Prep Basis: Dry Weight
	Date Collected: 23-Oct-08	Run ID: as090220-3x	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.37	0.016	0.1	
15117-96-1	U-235	0.094 +/- 0.055	0.044	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.303	3.59	pCi/g	83.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 60-80	Sample Matrix: SOIL	Prep Batch: AS090220-3	Final Aliquot: 1.05 g
Lab ID: 0812251-17	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-3-1	Prep Basis: Dry Weight
	Date Collected: 19-Sep-08	Run ID: as090220-3x	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.93 +/- 0.22	0.034	0.1	
15117-96-1	U-235	0.026 +/- 0.031	0.048	0.1	U
7440-61-1	U-238	1.1 +/- 0.25	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.303	3.26	pCi/g	75.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 80-100
Lab ID:	0812251-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.96 +/- 0.22	0.045	0.1	
15117-96-1	U-235	0.075 +/- 0.049	0.048	0.1	LT
7440-61-1	U-238	0.91 +/- 0.21	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.92	pCi/g	87.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 20-40
Lab ID:	0812251-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.39	0.059	0.1	
15117-96-1	U-235	0.14 +/- 0.075	0.070	0.1	
7440-61-1	U-238	1.9 +/- 0.39	0.069	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.371	3.15	pCi/g	72.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 40-60
Lab ID:	0812251-20

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 22-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.41	0.047	0.1	
15117-96-1	U-235	0.26 +/- 0.10	0.050	0.1	
7440-61-1	U-238	2.2 +/- 0.44	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	3.44	pCi/g	76.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-02-1-3
Lab ID:	0812251-21

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.5 +/- 0.82	0.046	0.1	
15117-96-1	U-235	0.20 +/- 0.085	0.021	0.1	
7440-61-1	U-238	4.4 +/- 0.81	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.457	3.59	pCi/g	80.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-02-1-3

Lab ID: 0812251-21DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.3 +/- 0.78	0.046	0.1	
15117-96-1	U-235	0.19 +/- 0.079	0.037	0.1	
7440-61-1	U-238	4.3 +/- 0.79	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.79	pCi/g	86.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 60-80
Lab ID:	0812251-22

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.39	0.048	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.038	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.288	3.40	pCi/g	79.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 240-260
Lab ID:	0812251-23

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 25-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.016	0.1	
15117-96-1	U-235	0.20 +/- 0.081	0.018	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.482	3.74	pCi/g	83.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-05-1.5-3.0
Lab ID:	0812251-24

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 23-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.1 +/- 0.60	0.049	0.1	
15117-96-1	U-235	0.23 +/- 0.096	0.043	0.1	
7440-61-1	U-238	3.0 +/- 0.59	0.019	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.444	3.08	pCi/g	69.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-Q09-0-1
Lab ID:	0812251-25

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 23-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.40	0.095	0.1	
15117-96-1	U-235	0.14 +/- 0.090	0.099	0.1	
7440-61-1	U-238	1.5 +/- 0.37	0.12	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	2.33	pCi/g	51.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-01-1-3
Lab ID:	0812251-26

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 23-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.47	0.050	0.1	
15117-96-1	U-235	0.17 +/- 0.084	0.049	0.1	
7440-61-1	U-238	2.0 +/- 0.42	0.062	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.499	2.78	pCi/g	61.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-01-1-3

Lab ID: 0812251-26DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jul-08

Date Prepared: 23-Feb-09

Date Analyzed: 02-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.42	0.084	0.1	
15117-96-1	U-235	0.11 +/- 0.067	0.063	0.1	
7440-61-1	U-238	2.3 +/- 0.47	0.059	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.427	2.70	pCi/g	61.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

Page 4 of 4

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-02-5-7
Lab ID:	0812251-27

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 23-Feb-09
Date Analyzed: 07-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 1000 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.57	0.026	0.1	Y2
15117-96-1	U-235	0.12 +/- 0.084	0.083	0.1	Y2
7440-61-1	U-238	3.0 +/- 0.63	0.10	0.1	Y2,M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.423	0.644	pCi/g	14.6	30 - 110 %	Y2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	L70791-10
Lab ID:	0812251-28

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.27	0.079	0.1	
15117-96-1	U-235	0.054 +/- 0.045	0.060	0.1	U
7440-61-1	U-238	1.4 +/- 0.30	0.063	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.378	3.35	pCi/g	76.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: L70819-11	Sample Matrix: SOIL	Prep Batch: AS090223-1	Final Aliquot: 1.06 g
Lab ID: 0812251-29	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090223-1-1	Prep Basis: Dry Weight
	Date Collected: 29-Jul-08	Run ID: AS090223-1A	Moisture(%): NA
	Date Prepared: 23-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.48	0.052	0.1	
15117-96-1	U-235	0.12 +/- 0.073	0.061	0.1	
7440-61-1	U-238	2.4 +/- 0.50	0.064	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.247	2.47	pCi/g	58.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita FMI-VRP

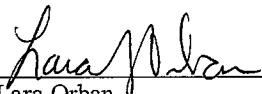
Work Order Number: 0812251

1. The following report consists of analytical results and supporting documentation for 28 soil samples received by ALS Paragon on 12/30/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812251-1 thru -3, -8, -9, -13, and -20 were sealed in steel cans on 01/07/09 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/28/09, respectively, is at least 97.78%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.89%.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/28/09.
4. The results for these samples are reported on a "Dry Weight" basis in units of pCi/gram.
5. Sample volume was insufficient to allow preparation of duplicates in batches GS090108-2 and GS090108-4. Duplicate analyses of samples 0812251-2, -4, and -24 were performed in lieu of prepared duplicates.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples. This is applicable for samples 0812251-1 thru -3, -8, -9, -13, and -20.
7. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium. This is applicable for samples 0812251-1 thru -3, -8, -9, -13, and -20.
8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.

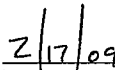


9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. The requested detection limit of 1.0 pCi/gram for ^{228}Ra was not met for many of the samples associated with this work order. The reported activities are greater than the achieved detection limits. The results have been flagged with a "M3" qualifier on the final reports. The results are submitted without further qualification.
11. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

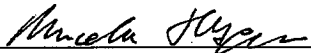
The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



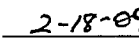
Lara Orban
Radiochemistry Primary Data Reviewer



Date



Radiochemistry Final Data Reviewer



Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812251

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB04 60-80	0812251-1		SOIL	05-Oct-08	13:17
ST-SB01 180-200	0812251-2		SOIL	25-Sep-08	17:12
ST-SB04 40-60	0812251-3		SOIL	05-Oct-08	12:57
ST-SB01 100-120	0812251-4		SOIL	25-Sep-08	9:22
ST-SB01 120-140	0812251-5		SOIL	25-Sep-08	10:37
ST-SB01 80-100	0812251-6		SOIL	24-Sep-08	12:57
ST-SB01 160-180	0812251-7		SOIL	25-Sep-08	16:27
ST-SB04 0-20	0812251-8		SOIL	05-Oct-08	12:07
ST-SB04 80-100	0812251-9		SOIL	05-Oct-08	13:37
ST-SB03 200-210	0812251-10		SOIL	03-Oct-08	12:52
ST-SB04 20-40	0812251-11		SOIL	05-Oct-08	12:27
ST-SB06 180-200	0812251-12		SOIL	24-Oct-08	9:27
ST-SB06 200-220	0812251-13		SOIL	24-Oct-08	11:47
ET-SB02 20-40	0812251-14		SOIL	19-Sep-08	10:25
ST-SB06 0-20	0812251-15		SOIL	21-Oct-08	11:48
ST-SB06 140-160	0812251-16		SOIL	23-Oct-08	13:37
ET-SB02 60-80	0812251-17		SOIL	19-Sep-08	15:43
ET-SB02 80-100	0812251-18		SOIL	19-Sep-08	16:32
ST-SB01 20-40	0812251-19		SOIL	24-Sep-08	9:07
ST-SB06 40-60	0812251-20		SOIL	22-Oct-08	9:07
EM-JS-02-1-3	0812251-21		SOIL	01-Aug-08	9:17
ST-SB01 60-80	0812251-22		SOIL	24-Sep-08	11:07
ST-SB06 240-260	0812251-23		SOIL	25-Oct-08	10:12
OD-SD-05-1.5-3.0	0812251-24		SOIL	29-Jul-08	
CP-Q09-0-1	0812251-25		SOIL	23-Jul-08	
OD-JS-01-1-3	0812251-26		SOIL	29-Jul-08	
OD-JS-02-5-7	0812251-27		SOIL	29-Jul-08	
L70791-10	0812251-28		SOIL	28-Jul-08	
L70819-11	0812251-29		SOIL	29-Jul-08	



Project Name/No.: <u>FU1-URP</u> Sampler(s): <u>K. Walsh</u> Turnaround (circle one): <u>Standard</u> or Rush (Due <u>12-22-08</u>) Dispose: <u>Date today</u> or Return to Client <u>12-22-08</u>																																																																																																																																																																																					
Report To: <u>Steven Vaughn</u> Phone: <u>(520) 907-2845</u> Fax: <u></u> E-mail: <u>steven_vaughn@urcorp.com</u> Company: <u>Freeport McMoran</u> Address: <u>6200 W Dardel Mile Rd</u> <u>Green Valley, AZ 85614</u>																																																																																																																																																																																					
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ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812251

Date: 12-22-08 Page 3 of 3

Project Name/No.: FMT-VRP	Sampler(s): Kildale	Turnaround (circle one): Standard	or Rush (Due)	Dispose: Date 60 day	or Return to Client																																									
Report To: Steven Vaughan Phone: (520) 407-2845 Fax: E-mail: Steven-Vaughan@curiscorp.com Company: Freeport McMoran Address: 6200 W Durnal Pkwy Rd. Green Valley, AZ 85614	Circle method (right); provide additional information as needed (comments).	Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers	VOCS	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	PH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9315 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Aluminum isotopes 234, 235, 238

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:
Order No. 050887
Fedex 796210837788

Relinquished By: (1) Signature: Ken W. L. Printed Name: Ken W. L. Date: 12-22-08 Time: 1600 Company: URS
(2) Signature: Received By: Signature: Printed Name: Date: Time: Company:

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812251Project Manager: JEInitials: LOT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	YES	<input checked="" type="radio"/> NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<input checked="" type="radio"/> NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY YES NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO <input type="radio"/> NA (If no. see Form 008.)		

Additional Information: 8-5-08 PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

(28) L70791-10 Broken lids: 0812251-2 -16 no leakage detected
 (29) L70819-11 -3 -17
 post-it note ID's fell -4 -18 All samples are
 off and these are the -5 limited volume.
 ID's on a label on the bag -9

If applicable, was the client contacted? ☒ YES ☐ NO ☐ NA Contact: Rick Smith Date/Time: Project Manager Signature / Date:

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812251

Page 1 of 1

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111288/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code

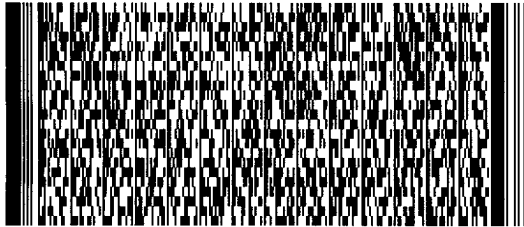


Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524



2 of 3

TUE - 30DEC

AA

MPS# 7962 1083 7788
 0263

STANDARD OVERNIGHT

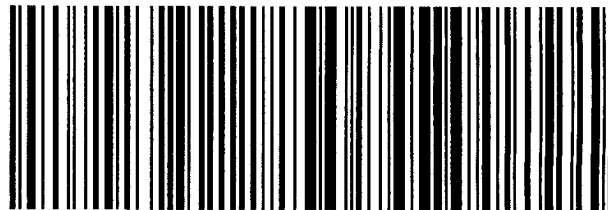
Mstr# 7962 1083 7711 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090108-2MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 60 minutes

Final Aliquot: 75.3 g

Result Units: pCi/g

File Name: 090121d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.32 +/- 0.42	0.85	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090108-4MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 45 minutes

Final Aliquot: 77.9 g

Result Units: pCi/g

File Name: 090164d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.075 +/- 0.30	0.57	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-7MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 45 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090171d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.21 +/- 0.21	0.32	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-7MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 45 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090171d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.045 +/- 0.34	0.68	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090108-2LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090133d09

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1110 +/- 130	3.03	986	112	85 - 115	P
10198-40-0	Co-60	479 +/- 56.1	1.75	455	105	85 - 115	P
10045-97-3	Cs-137	393 +/- 46.1	2.09	374	105	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090108-4LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090123d09

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1120 +/- 131	3.01	986	114	85 - 115	P
10198-40-0	Co-60	476 +/- 55.9	1.76	456	105	85 - 115	P
10045-97-3	Cs-137	387 +/- 45.5	2.19	374	104	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-7ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090132d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	451 +/- 52.9	2.61	470	96.0	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-7LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090134d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	482 +/- 57.1	7.16	462	104	85 - 115	P
10198-40-0	Co-60	210 +/- 24.6	0.831	213	98.3	85 - 115	P
10045-97-3	Cs-137	181 +/- 21.4	1.18	175	104	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 100-120

Lab ID: 0812251-4DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090142d03

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.4 +/- 0.51	1.6 +/- 1.0	0.26	2.13	M3,G,TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-05-1.5-3.0

Lab ID: 0812251-24DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090148d03

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	3.2 +/- 0.77	3.3 +/- 0.87	0.07	2.13	M3,G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: L70819-11

Lab ID: 0812251-29DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 76.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090117d09

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.4 +/- 0.66	2.3 +/- 0.90	0.14	2.13	M3,G,TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 60-80
Lab ID:	0812251-1

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090127d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.48	0.51	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 60-80

Lab ID: 0812251-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090127d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.70	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 180-200	Sample Matrix: SOIL	Prep Batch: GS090109-7	Final Aliquot: 162 g
Lab ID: 0812251-2	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-7-1	Prep Basis: Dry Weight
Library: RA226.LIB	Date Collected: 25-Sep-08	Run ID: GS090109-7A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 28-Jan-09	Report Basis: Dry Weight	File Name: 090128d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.43	0.52	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 180-200

Lab ID: 0812251-2

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090128d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.53	0.88	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 40-60
Lab ID:	0812251-3

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 165 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090166d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.50	0.59	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 40-60
Lab ID:	0812251-3

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 165 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090166d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.69	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 100-120
Lab ID:	0812251-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.51	0.79	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 100-120

Lab ID: 0812251-4DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090142d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 1.0	1.4	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 120-140

Lab ID: 0812251-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090165d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.83	1.2	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 80-100
Lab ID:	0812251-6

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 72.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090114d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.68	1.3	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 160-180

Lab ID: 0812251-7

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090141d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.88	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 0-20

Lab ID: 0812251-8

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090129d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.47	0.48	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 0-20

Lab ID: 0812251-8

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090129d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.58	0.88	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 80-100

Lab ID: 0812251-9

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 175 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090167d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.52	0.56	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 80-100

Lab ID: 0812251-9

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 175 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090167d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.62	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 200-210

Lab ID: 0812251-10

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 68.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090090d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.68	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 20-40

Lab ID: 0812251-11

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090166d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 1.0	1.3	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 180-200
Lab ID:	0812251-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090115d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.91	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 200-220

Lab ID: 0812251-13

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 178 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.44	0.47	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 200-220

Lab ID: 0812251-13

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 178 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.52	0.93	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 20-40
Lab ID:	0812251-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090091d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.78	1.4	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 0-20
Lab ID:	0812251-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 21-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 79.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090127d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.57	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 140-160
Lab ID:	0812251-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 62.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.67	1.4	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 60-80

Lab ID: 0812251-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 100 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090128d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.63	1.0	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 80-100

Lab ID: 0812251-18

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090093d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.65	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 20-40

Lab ID: 0812251-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090129d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.99	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 40-60

Lab ID: 0812251-20

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 22-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 165 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090169d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.40	0.39	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 40-60

Lab ID: 0812251-20

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 22-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 165 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090169d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.53	0.84	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Field ID: ST-SB01 60-80

Lab ID: 0812251-22

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090094d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.58	0.95	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 240-260

Lab ID: 0812251-23

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 60 minutes

Report Basis: Dry Weight

Final Aliquot: 76.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090132d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.45	0.88	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-05-1.5-3.0
Lab ID:	0812251-24

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090095d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.2 +/- 0.77	1.2	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-05-1.5-3.0

Lab ID: 0812251-24DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090148d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.3 +/- 0.87	1.3	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-Q09-0-1
Lab ID:	0812251-25

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090171d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.66	1.2	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-01-1-3

Lab ID: 0812251-26

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090120d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.71	1.1	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-02-5-7

Lab ID: 0812251-27

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090096d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 0.84	1.3	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: L70791-10

Lab ID: 0812251-28

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 94.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090172d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.66	0.93	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	L70819-11
Lab ID:	0812251-29

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 76.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090081d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.66	1.0	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: L70819-11

Lab ID: 0812251-29DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 76.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090117d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.90	1.3	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

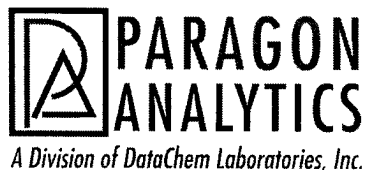
Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



March 20, 2009

Mr. Aaron Hilshorst
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-255
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Hilshorst:

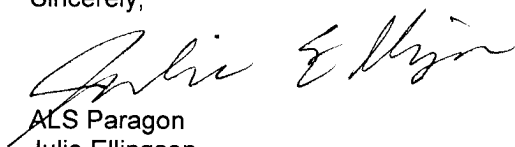
Twenty-four soil samples were received from Freeport McMoRan Sierrita on December 30, 2008. The samples were scheduled for the following analyses:

Isotopic Uranium	pages 1-40	Radium-228 by Method 9320	pages 1-11
Gamma Spectroscopy	pages 1-46	Radium-226 by EPA Method 903.1 (m)	pages 1-38

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,


ALS Paragon
Julie Ellingson
Project Manager

JME/eh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812255

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB06 20-40	0812255-1		SOIL	21-Oct-08	14:37
ST-SB06 300-320	0812255-2		SOIL	28-Oct-08	13:52
ST-SB01 20-40	0812255-3		SOIL	18-Sep-08	11:35
ET-SB01 40-60	0812255-4		SOIL	18-Sep-08	12:10
ST-SB06 220-240	0812255-5		SOIL	24-Oct-08	14:52
ST-SB01 40-60	0812255-6		SOIL	24-Sep-08	9:47
ST-SB01 0-20	0812255-7		SOIL	24-Sep-08	8:42
ST-SB06 100-120	0812255-8		SOIL	23-Oct-08	10:32
ST-SB06 160-180	0812255-9		SOIL	23-Oct-08	14:52
ST-SB01 220-235.5	0812255-10		SOIL	26-Sep-08	11:12
ST-SB01 237-255.5	0812255-11		SOIL	26-Sep-08	12:32
ET-SB01 0-20	0812255-12		SOIL	17-Sep-08	16:03
ST-SB06 280-300	0812255-13		SOIL	28-Oct-08	9:47
ST-SB06 260-280	0812255-14		SOIL	28-Oct-08	9:07
ST-SB06 60-80	0812255-15		SOIL	22-Oct-08	10:27
ET-SB02 0-20	0812255-16		SOIL	19-Sep-08	9:55
ET-SB02 50-60	0812255-17		SOIL	19-Sep-08	14:17
ET-SB01 80-100	0812255-18		SOIL	18-Sep-08	15:20
ST-SB06 80-100	0812255-19		SOIL	23-Oct-08	9:52
ST-SB06 120-140	0812255-20		SOIL	23-Oct-08	11:07
ST-SB01 200-220	0812255-21		SOIL	26-Sep-08	10:02
ET-SB01 60-80	0812255-22		SOIL	18-Sep-08	14:05
ET-SB02 40-50	0812255-23		SOIL	19-Sep-08	13:45
ST-SB06 300-320D	0812255-24		SOIL	28-Oct-08	13:52



PARAGON ANALYTICS

ALS Paragon

ALS Laboratory Group



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID 0812255

Date: 12-23-08 Page 1 of 3

Project Name/No.: <u>Enl-VRP</u> Sampler(s): <u>Kwikulsh</u> Turnaround (circle one): <u>Standard</u> or Rush (Due _____) Dispose: <u>60 day</u> or Return to Client _____	
Report To: <u>Steven Vaughan</u> Phone: (520) 407-2875 Fax: _____ E-mail: <u>Steven_vanugh@uscorp.com</u> Company: <u>Freight McMoran</u> Address: <u>6200 W Duval Mine Rd.</u> <u>Green Valley</u>	
Circle method (right); provide additional information as needed (comments).	
Sample ID	Date Time* Lab ID Matrix Preservative (Indicate type: HCl, etc.) No. of Containers
ST-SB06 20-40	10/21/08 1437 ① S w/a 1
ST-SB06 300-320	10/28/08 1333 ② S w/a 1
ST-SB01-20-40	9/18/08 1135 ③ S w/a 1
ET-SB01-40-60	9/18/08 1210 ④ S w/a 1
ST-SB06 300-320	10/21/08 1352 ⑤ S w/a 1
ST-SB06 230-240	10/21/08 1452 ⑥ S w/a 1
ST-SB01-40-60	9/24/08 0947 ⑦ S w/a 1
ST-SB01-0-20	9/24/08 0842 ⑧ S w/a 1
ST-SB06-100-120	10/21/08 1032 ⑨ S w/a 1
ST-SB06-160-180	10/23/08 1452 ⑩ S w/a 1
*Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter Comments: <u>Order # 0508VT</u> <u>Report No. 797207317863</u> <u>Fedex</u>	
Relinquished By: (1) Signature: <u>Kevin Walsh</u> Printed Name: <u>Kevin Walsh</u> Date: <u>12-23-08</u> Time: <u>1600</u> Company: <u>URS</u> Relinquished By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____	
Received By: (1) Signature: <u>Cheryl Trimble</u> Printed Name: <u>Cheryl Trimble</u> Date: <u>12-30-08</u> Time: <u>1025</u> Company: <u>ALS Paragon</u> Received By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Chain-of-Custody

y

LAB ID 0812255

800-443-1311 or (970) 490-1311 (970) 490-1322 Fax

Date: 12-23-08

Page 2 of 3

[illegible]

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812255Project Manager: JEInitials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u> NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u> NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>N/A</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>N/A</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>NO</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	<u>CT YES</u> 12-30-08	<u>NO</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>N/A</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>N/A</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>N/A</u>	YES NO
17. Were the samples shipped on ice?	YES	<u>NO</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>RAD ONLY</u>	YES <u>NO</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>YES</u> NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

COC SAYS ST-SB01-20-40 LABEL READS ET-SB01-20-40 - Times ARE both 1135 ^{used} _{COG}
 COC READS ST-SB06-208-300 LABEL READS ST-SB06 LID HAS 280-300 Times both 947
 ST-SB06-260-280 HAS AN MSD BOTTLE
 Broken Lids: 0812255-13 and -18 - no visible leakage
 All bottles ARE limited volumes

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812255

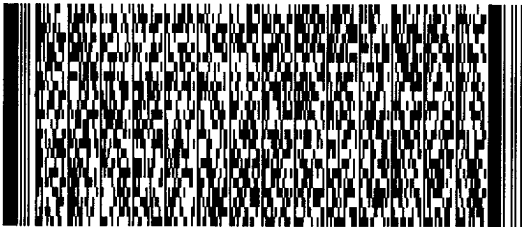
From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111298/28/23

SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/NET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



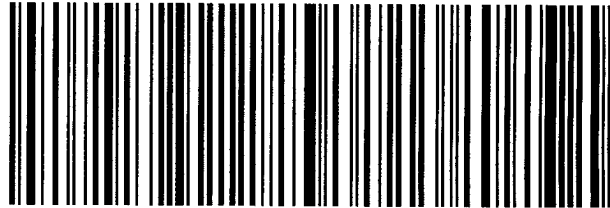
Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

MPS# 3 of 3
 0263 7972 0731 7863
 Mstr# 7962 1083 7711 0201

TUE - 30DEC AA
STANDARD OVERNIGHT

XH FTCA

80524
CO-US
DEN



After printing this label:

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2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

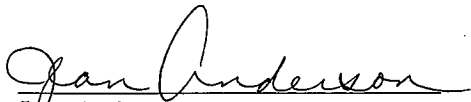
Freeport McMoRan Sierrita

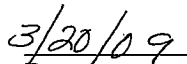
FMI-VRP

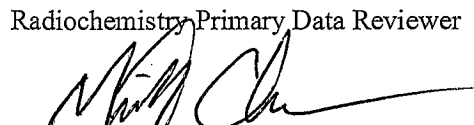
Work Order Number: 0812255


1. This report consists of the analytical results for 22 soil samples received by ALS Paragon on 12/30/2008.
2. These samples were prepared and analyzed according to procedures SOP783R8 and SOP336R0. The analyses were completed on 03/17/2009.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. The magnitude of the negative activity for method blank RE090220-5MB is greater than the 2 sigma TPU at 2.26 sigma. The analyst's review of the data does not indicate a problem with the instrument data or the subsequent reporting systems. The data quality is not believed to be affected and the results are submitted without qualification. Under typical conditions, where background level sample data is normally distributed and analyzed by paired observations, this event is likely to occur at least 2.5% of the time.
5. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Jean Anderson
Radiochemistry Primary Data Reviewer


Date


Radiochemistry Final Data Reviewer


Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812255

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB06 20-40	0812255-1		SOIL	21-Oct-08	14:37
ST-SB06 300-320	0812255-2		SOIL	28-Oct-08	13:52
ST-SB01 20-40	0812255-3		SOIL	18-Sep-08	11:35
ET-SB01 40-60	0812255-4		SOIL	18-Sep-08	12:10
ST-SB06 220-240	0812255-5		SOIL	24-Oct-08	14:52
ST-SB01 40-60	0812255-6		SOIL	24-Sep-08	9:47
ST-SB01 0-20	0812255-7		SOIL	24-Sep-08	8:42
ST-SB06 100-120	0812255-8		SOIL	23-Oct-08	10:32
ST-SB06 160-180	0812255-9		SOIL	23-Oct-08	14:52
ST-SB01 220-235.5	0812255-10		SOIL	26-Sep-08	11:12
ST-SB01 237-255.5	0812255-11		SOIL	26-Sep-08	12:32
ET-SB01 0-20	0812255-12		SOIL	17-Sep-08	16:03
ST-SB06 280-300	0812255-13		SOIL	28-Oct-08	9:47
ST-SB06 260-280	0812255-14		SOIL	28-Oct-08	9:07
ST-SB06 60-80	0812255-15		SOIL	22-Oct-08	10:27
ET-SB02 0-20	0812255-16		SOIL	19-Sep-08	9:55
ET-SB02 50-60	0812255-17		SOIL	19-Sep-08	14:17
ET-SB01 80-100	0812255-18		SOIL	18-Sep-08	15:20
ST-SB06 80-100	0812255-19		SOIL	23-Oct-08	9:52
ST-SB06 120-140	0812255-20		SOIL	23-Oct-08	11:07
ST-SB01 200-220	0812255-21		SOIL	26-Sep-08	10:02
ET-SB01 60-80	0812255-22		SOIL	18-Sep-08	14:05
ET-SB02 40-50	0812255-23		SOIL	19-Sep-08	13:45
ST-SB06 300-320D	0812255-24		SOIL	28-Oct-08	13:52



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Chain-of-Custody

ily

LAB ID 0817255

800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Date: 12-23-08 Page / of 3


Dispose: Date: 01/01/2011 or Return to Client

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotope
ST-SB06-20-4c	10/21/08	1437	①	C	n/a	1																												X	
ST-SB06-300-32c	10/28/08	1352	②	C	n/a	1																												X	
ST-SB01-20-40	9/8/08	1135	③	C	n/a	1																												X	
ET-SB01-40-60	9/8/08	1210	④	C	n/a	1																												X	
ST-SB06-300-32c(1)	10/28/08	1352	⑤	C	n/a	1																												X	
ST-SB06-250-240	10/21/08	1452	⑥	C	n/a	1																												X	
ST-SB01-40-60	9/24/08	0947	⑦	C	n/a	1																												X	
ST-SB01-0-20	9/24/08	0842	⑧	C	n/a	1																												X	
ST-SB06-100-120	10/23/08	1032	⑨	C	n/a	1																												X	
ST-SB06-140-180	10/23/08	1452	⑩	C	n/a	1																												X	

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Relinquished By:  (1)

Signature Ken Walsh
 Printed Name Ken Walsh
 Date 12-23-08 Time 1600
 Company URS

Relinquished By:	(2)
------------------	-----

Signature _____
 Printed Name _____
 Date _____ Time _____
 Company _____

Order # 0508VT
Report # 1

Fedex 797207317863

Received By: _____	Received By: _____
Signature _____	Signature _____
Printed Name _____	Printed Name _____
Date _____	Date _____
Time _____	Time _____
Company _____	Company _____

3

Form 202r6.xls (6/16/06)



PARAGON ANALYTICAL

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID **0812255**

Date: **12-23-08** Page **2** of **3**

Project Name/No.: **EM1-VRP** Sampler(s): **K. Walsh** Turnaround (circle one): **Standard** or **Rush** (Due **12-23-08**) Dispose: **Date today** or **Return to Client**

Report To: **Steven Vaughn**
Phone: **(520) 407-2845**
Fax:

E-mail: **Steven.Vaughn@wscorp.com**
Company: **Freight McMoran**
Address: **6200 W Duval Mine Rd.
Green Valley, AZ 85614**

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers
ST-SBC1-220-35	9/26/08	1112	10	S	N/A	1
ST-SBC1-237-255.5	9/26/08	1232	11	S	N/A	1
ET-SBC1-0-20	9/17/08	1603	12	S	N/A	1
ST-SBC6 280-300	9/28/08	0947	13	S	N/A	1
ST-SBC6 260-280	9/28/08	0907	14	S	N/A	1
ST-SBC6 60-80	9/12/08	1027	15	S	N/A	1
ET-SBC2-0-20	9/19/08	0955	16	S	N/A	1
ET-SBC2-50-60	9/19/08	1417	17	S	N/A	1
ET-SBC1-80-100	9/16/08	1520	18	S	N/A	1
ST-SBC6-80-100	9/23/08	0952	19	S	N/A	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. **0548VT**

Fedex **797207317863**

SW8260B	VOCs																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Relinquished By: (1)	Relinquished By: (2)
Signature <u>Kevin Walsh</u>	Signature _____
Printed Name <u>Kevin Walsh</u>	Printed Name _____
Date <u>12-23-08</u>	Date _____
Time <u>1600</u>	Time _____
Company <u>URS</u>	Company _____
Received By: (1)	Received By: (2)
Signature <u>Cheryl Trimble</u>	Signature _____
Printed Name <u>Cheryl Trimble</u>	Printed Name _____
Date <u>12-30-08</u>	Date _____
Time <u>1025</u>	Time _____
Company <u>ALS Paragon</u>	Company _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JEWorkorder No: 0812255Initials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>(NO)</u>
2. Are custody seals on shipping containers intact?	NONE	<u>(YES)</u> NO
3. Are Custody seals on sample containers intact?	<u>(NONE)</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>(YES)</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>(YES)</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>(NO)</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>(YES)</u> NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>(N/A)</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>(N/A)</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>(NO)</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>(YES)</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>(YES)</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	<u>CT 12-30-08</u> <u>(YES)</u>	<u>(NO)</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>(N/A)</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>(N/A)</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>(N/A)</u>	YES NO
17. Were the samples shipped on ice?	YES	<u>(NO)</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<u>(RAD ONLY)</u> YES <u>(NO)</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>(YES)</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

COC SAYS ST-SB01-20-40 label reads ET-SB01-20-40 - Times ARE both 1135 ^{-used} _{-COC}

COC READS ST-SB06-208-300 label reads ST-SB06 lid has 280-300 Times both 947

ST-SB06-260-280 has an MSD bottle

Broken Lids: 0812255-13 and -18 - no visible leakage

All bottles are limited volume

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812255

Page 1 of 1

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL511208/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

12
-1

Delivery Address Bar Code



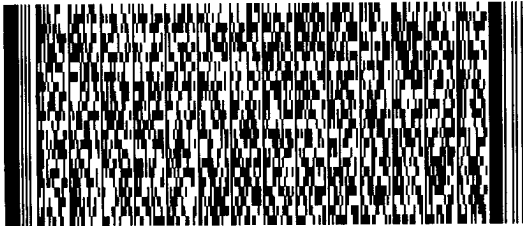
Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524



3 of 3

TUE - 30DEC

AA

MPS# 7972 0731 7863
 0263

STANDARD OVERNIGHT

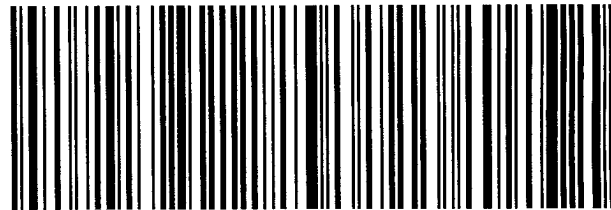
Mstr# 7962 1083 7711 0201

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-5MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.26 +/- 0.23	0.48	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812255-1

Date Printed: Thursday, March 19, 2009

ALS Paragon

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-6MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.053 +/- 0.19	0.35	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812255-1

Date Printed: Thursday, March 19, 2009

ALS Paragon
LIMS Version: 6.252A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-5LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	50.8 +/- 9.25	0.522	42.9	118	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812255-1

Date Printed: Thursday, March 19, 2009

ALS Paragon

LIMS Version: 6.252A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-6LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	41.7 +/- 7.80	0.240	43.1	96.8	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812255-1

Date Printed: Thursday, March 19, 2009

ALS Paragon

LIMS Version: 6.252A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 60-80

Lab ID: 0812255-15MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 22-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	47.7	1.6	0.273	43.9	105	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812255-1

Date Printed: Thursday, March 19, 2009

ALS Paragon

LIMS Version: 6.252A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 40-60

Lab ID: 0812255-6DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 24-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	0.65 +/- 0.34	0.99 +/- 0.47	0.59	2.13	LT

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 237-255.5

Lab ID: 0812255-11DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 26-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.10 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	0.94 +/- 0.35	0.92 +/- 0.42	0.04	2.13	LT

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 20-40
Lab ID:	0812255-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 21-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.48	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 300-320
Lab ID:	0812255-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.58 +/- 0.25	0.27	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 20-40
Lab ID:	0812255-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 18-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.74	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ET-SB01 40-60
Lab ID:	0812255-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 18-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.57	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 220-240
Lab ID:	0812255-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.46	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 40-60	Sample Matrix: SOIL	Prep Batch: RE090220-5	Final Aliquot: 1.04 g
Lab ID: 0812255-6	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-5-1	Prep Basis: Dry Weight
	Date Collected: 24-Sep-08	Run ID: RE090220-5A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 11-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.65 +/- 0.34	0.45	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 40-60
Lab ID:	0812255-6DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 24-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5

QCBatchID: RE090220-5-1

Run ID: RE090220-5A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.99 +/- 0.47	0.54	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 0-20
Lab ID:	0812255-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.0 +/- 0.57	0.74	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 100-120
Lab ID:	0812255-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.48	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 160-180
Lab ID:	0812255-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.53	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 220-235.5
Lab ID:	0812255-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 26-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.44	0.24	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 237-255.5
Lab ID:	0812255-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 26-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.94 +/- 0.35	0.33	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 237-255.5

Lab ID: 0812255-11DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 26-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.10 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.92 +/- 0.42	0.47	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ET-SB01 0-20
Lab ID:	0812255-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.51	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 60-80
Lab ID:	0812255-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 22-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.55	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ET-SB02 0-20
Lab ID:	0812255-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.44	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ET-SB02 50-60
Lab ID:	0812255-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.65 +/- 0.29	0.22	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ET-SB01 80-100
Lab ID:	0812255-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 18-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.94 +/- 0.38	0.36	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 80-100
Lab ID:	0812255-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.40	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 120-140	Sample Matrix: SOIL	Prep Batch: RE090220-6	Final Aliquot: 1.02 g
Lab ID: 0812255-20	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-6-1	Prep Basis: Dry Weight
	Date Collected: 23-Oct-08	Run ID: RE090220-6A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 16-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.50	0.26	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 200-220
Lab ID:	0812255-21

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 26-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.12 +/- 0.18	0.30	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 60-80	Sample Matrix: SOIL	Prep Batch: RE090220-6	Final Aliquot: 1.01 g
Lab ID: 0812255-22	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-6-1	Prep Basis: Dry Weight
	Date Collected: 18-Sep-08	Run ID: RE090220-6A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 17-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.87 +/- 0.33	0.31	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ET-SB02 40-50
Lab ID:	0812255-23

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.51	0.25	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 300-320D
Lab ID:	0812255-24

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.10 +/- 0.25	0.43	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

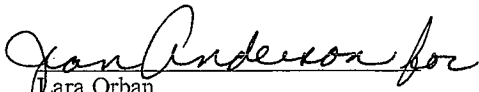
Freeport McMoRan Sierrita

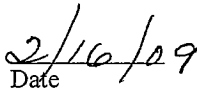
FMI-VRP

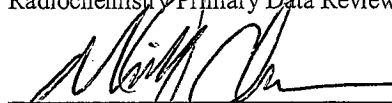
Work Order Number: 0812255

1. This report consists of the analytical results for two soil samples received by ALS Paragon on 12/30/08.
2. These samples were prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in these samples.
3. The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analyses were completed on 01/29/09.
4. The analyses results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil samples from this work order were initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. No further anomalous situations were noted during the preparation and analysis of these samples. All quality control criteria were met.

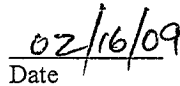
The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer


Date 02/16/09


Radiochemistry Final Data Reviewer

FOR
JOHN
PETRONIC


Date 02/16/09

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812255

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB06 20-40	0812255-1		SOIL	21-Oct-08	14:37
ST-SB06 300-320	0812255-2		SOIL	28-Oct-08	13:52
ST-SB01 20-40	0812255-3		SOIL	18-Sep-08	11:35
ET-SB01 40-60	0812255-4		SOIL	18-Sep-08	12:10
ST-SB06 220-240	0812255-5		SOIL	24-Oct-08	14:52
ST-SB01 40-60	0812255-6		SOIL	24-Sep-08	9:47
ST-SB01 0-20	0812255-7		SOIL	24-Sep-08	8:42
ST-SB06 100-120	0812255-8		SOIL	23-Oct-08	10:32
ST-SB06 160-180	0812255-9		SOIL	23-Oct-08	14:52
ST-SB01 220-235.5	0812255-10		SOIL	26-Sep-08	11:12
ST-SB01 237-255.5	0812255-11		SOIL	26-Sep-08	12:32
ET-SB01 0-20	0812255-12		SOIL	17-Sep-08	16:03
ST-SB06 280-300	0812255-13		SOIL	28-Oct-08	9:47
ST-SB06 260-280	0812255-14		SOIL	28-Oct-08	9:07
ST-SB06 60-80	0812255-15		SOIL	22-Oct-08	10:27
ET-SB02 0-20	0812255-16		SOIL	19-Sep-08	9:55
ET-SB02 50-60	0812255-17		SOIL	19-Sep-08	14:17
ET-SB01 80-100	0812255-18		SOIL	18-Sep-08	15:20
ST-SB06 80-100	0812255-19		SOIL	23-Oct-08	9:52
ST-SB06 120-140	0812255-20		SOIL	23-Oct-08	11:07
ST-SB01 200-220	0812255-21		SOIL	26-Sep-08	10:02
ET-SB01 60-80	0812255-22		SOIL	18-Sep-08	14:05
ET-SB02 40-50	0812255-23		SOIL	19-Sep-08	13:45
ST-SB06 300-320D	0812255-24		SOIL	28-Oct-08	13:52



PARAGON
ANALYTICAL

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812255

Date: 12-23-08 Page 1 of 3

Project Name/No.: EMI-VIRP Sample(s): K. Williams Turnaround (circle one): Standard or Rush (Due 12-23-08) Date: 12-23-08 or Return to Client

Report To: Steven Laughlin
Phone: (520) 407-2875
Fax:

E-mail: steven_laughlin@uscorp.com
Company: Freight McMoran
Address: 6200 W Duval Mine Rd.
Green Valley

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time	Lab ID	Matrix	Preservative	No. of Containers
ST-SB06-20-40	10/21/08	1437	①	S	n/a	1
ST-SB06-300-320	10/28/08	1333	②	S	n/a	1
ST-SB01-20-40	9/8/08	1135	③	S	n/a	1
ET-SB01-40-60	9/8/08	1210	④	S	n/a	1
ST-SB06-300-320	10/28/08	1333	⑤	S	n/a	1
ST-SB06-250-240	10/21/08	1452	⑥	S	n/a	1
ST-SB01-40-60	9/24/08	0947	⑦	S	n/a	1
ST-SB01-0-20	9/24/08	0842	⑧	S	n/a	1
ST-SB06-100-120	10/23/08	1032	⑨	S	n/a	1
ST-SB06-160-180	10/23/08	1452	⑩	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order #
Report No. 0508VT

Fedex 797207317863

VOCs	SW8260B	BTEX (only)	SW8021B	SVOCs	SW8270C	OC Pesticides	SW8081A	PCBs	SW8082	Herbicides	SW8151A	Explosives	SW8330	TCLP Organics	SW1311	TCLP Metals	SW1311	Hg	SW6010B	7470	E200	7	Total Metals	by ICP/MS	SW6020A	E200	8	Dissolved Metals	by ICP/MS	SW6020A	E200	8	Hexavalent Chromium	SW7196A	Alkaline Digest?	Y / N	Inorganic Anions	SW9056	E300	0	(specify in comments)	Solids:	Total	E160.3	TDS	E160.1	TSS	E160.2	pH	SW9040B	SW9045C	TPH	SW8015B	GRO	DRO	(circle one or both)	Gross Alpha / Beta	SW9310	E900	0	Actinides	by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906	0	Total Alpha-Emitting Radium	SW9315	E903	0	Radium 226	E903	1	Radium 228	SW9320	E904	0	Strontium 90 (Total RadioSr)	DS811	00	Gamma Isotopes	E901	1	Radon 222	SM7510RN	Uranium Isotopes	234, 235, 238																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

Relinquished By:	(1)	Relinquished By:	(2)
Signature	<u>[Signature]</u>	Signature	<u>[Signature]</u>
Printed Name	<u>Kevin Walsh</u>	Printed Name	<u>[Printed Name]</u>
Date	<u>12-23-08</u>	Date	<u>[Date]</u>
Company	<u>URS</u>	Company	<u>[Company]</u>
Received By:	(1)	Received By:	(2)
Signature	<u>[Signature]</u>	Signature	<u>[Signature]</u>
Printed Name	<u>Cheryl Trimble</u>	Printed Name	<u>[Printed Name]</u>
Date	<u>12-30-08</u>	Date	<u>[Date]</u>
Company	<u>ALS Paragon</u>	Company	<u>[Company]</u>



PARAGON ANALYTICAL

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812255

Date: 12-23-08 Page 2 of 3

Project Name/No.: EM1-VRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due 12-23-08) Dispose: 12-23-08 Date 12-23-08 or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax: _____

E-mail: Steven.Vaughn@wscorp.com
Company: Freemont McMoran
Address: 6200 W Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers
ST-SBC1-220-35	9/26/08	1112	10	S	W/a	1
ST-SBC1-237-255.5	9/26/08	1232	11	S	W/a	1
ET-SBC1-0-20	9/17/08	1603	12	S	W/a	1
ST-SBC6 280-300	9/28/08	0947	13	S	W/a	1
ST-SBC6 260-280	9/28/08	0907	14	S	W/a	1
ST-SBC6 60-80	9/12/08	1027	15	S	W/a	1
ET-SBC2-0-20	9/19/08	0955	16	S	W/a	1
ET-SBC2-50-60	9/19/08	1417	17	S	W/a	1
ET-SBC1-80-100	9/16/08	1520	18	S	W/a	1
ST-SBC6-80-100	9/23/08	0952	19	S	W/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 0548VT

Fedex 797207317863

SW8260B	VOCs																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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Relinquished By: (1)	Relinquished By: (2)
Signature <u>Kevin Walsh</u>	Signature _____
Printed Name <u>Kevin Walsh</u>	Printed Name _____
Date <u>12-23-08</u>	Date _____
Time <u>1600</u>	Time _____
Company <u>URS</u>	Company _____
Received By: (1)	Received By: (2)
Signature <u>Cheryl Trimble</u>	Signature _____
Printed Name <u>Cheryl Trimble</u>	Printed Name _____
Date <u>12-30-08</u>	Date _____
Time <u>1025</u>	Time _____
Company <u>ALS Paragon</u>	Company _____



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID 0812255

800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Date: 12-23-08 Page 3 of 3

Project Name/No.: F511-VRP Sampler(s): R. Warkel Turnaround (circle one): Standard or Rush (Due _____) Dispose: _____ Date 6/24/20 or Return to Client: _____

Report To: Steven Vaughan
Phone: (520) 407-2845

Fax:

E-mail: stephen_vaughn@usccr.dicm

Company: Freight McMoran

Address: 6200 W Duval Hwy R.I.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers
ST-5B06	120-140	10/23/08	1107	5	w/a	1
ST-5B01	200-220	9/26/08	1002	5	w/a	1
ET-5B01	60-80	9/18/08	1405	5	w/a	1
ET-5B02	40-50	9/19/08	1345	5	w/a	1

[illegible]

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Relinquished By: <u>Kee Wee</u> Signature _____ Printed Name _____ Date <u>12-23-08</u> Time <u>16:00</u> Company <u>WRC</u>	Relinquished By: _____ Signature _____ Printed Name _____ Date _____ Time _____ Company _____
--	---

Received By: _____	Received By: _____
Signature _____	Signature _____
Printed Name _____	Printed Name _____
Date _____	Date _____
Time _____	Time _____
Company _____	Company _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JEWorkorder No: 0812255Initials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>(NO)</u>
2. Are custody seals on shipping containers intact?	NONE	<u>(YES)</u> NO
3. Are Custody seals on sample containers intact?	<u>(NONE)</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>(YES)</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>(YES)</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>(NO)</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>(YES)</u> NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>(N/A)</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>(N/A)</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>(NO)</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>(YES)</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>(YES)</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	CT <u>(YES)</u>	<u>(NO)</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>(N/A)</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>(N/A)</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>(N/A)</u>	YES NO
17. Were the samples shipped on ice?	YES	<u>(NO)</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<u>(RAD ONLY)</u> YES <u>(NO)</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>(YES)</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

COC SAYS ST-SB01-20-40 label reads ET-SB01-20-40 - Times ARE both 1135 - used - COC ID

COC READS ST-SB06-208-300 label reads ST-SB06 lid has 280-300 Times both 947

ST-SB06-260-280 has an MSD bottle

Broken Lids: 0812255-13 and -18 - no visible leakage

All bottles are limited volume

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812255

Page 1 of 1

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111208/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/NET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

12
-1

Delivery Address Bar Code



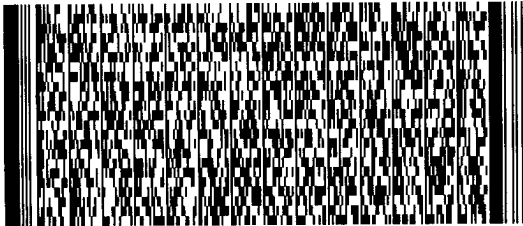
Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

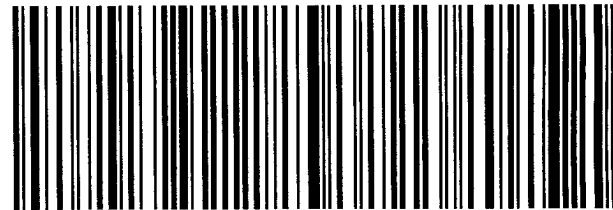


MPS# 3 of 3
 0263 7972 0731 7863
 Mstr# 7962 1083 7711 0201

TUE - 30DEC AA
 STANDARD OVERNIGHT

XH FTCA

80524
 CO-US
 DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812255-1

Date Printed: Friday, February 13, 2009

ALS Paragon
LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812255-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 50-60
Lab ID:	0812255-17

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 19-Sep-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.502 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 1.5	3.0	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	37050	32000	ug	86.3	40 - 110 %	
YTTRIUM	8713	4420	ug	50.7	40 - 110 %	
Total				43.8	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812255-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 80-100
Lab ID:	0812255-19

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 23-Oct-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.507 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 1.2	2.4	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35730	32700	ug	91.4	40 - 110 %	
YTTRIUM	8713	5350	ug	61.4	40 - 110 %	
Total				56.1	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812255-1



ALS Paragon



Isotopic Uranium Case Narrative

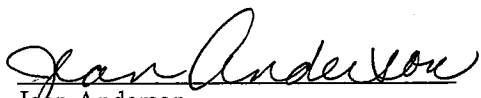
Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812255

1. This report consists of the analytical results for 24 soil samples received by ALS Paragon on 12/30/2008.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to potential matrix interference, the samples were prepared at a reduced aliquot of ~1 gram.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 03/11/2009.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. Uranium-234 activity is reported in method blank AS090223-1MB above the minimum detectable concentration value. The measured blank activity is below the requested MDC of 0.1 pCi/g. Results are acceptable according to SOP715R15, and are submitted without further qualification.
7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

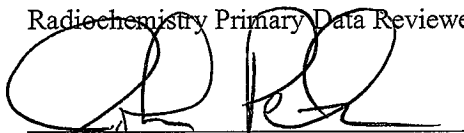


Jean Anderson

Radiochemistry Primary Data Reviewer

3/20/09

Date



Radiochemistry Final Data Reviewer

03/20/09

Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812255

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB06 20-40	0812255-1		SOIL	21-Oct-08	14:37
ST-SB06 300-320	0812255-2		SOIL	28-Oct-08	13:52
ST-SB01 20-40	0812255-3		SOIL	18-Sep-08	11:35
ET-SB01 40-60	0812255-4		SOIL	18-Sep-08	12:10
ST-SB06 220-240	0812255-5		SOIL	24-Oct-08	14:52
ST-SB01 40-60	0812255-6		SOIL	24-Sep-08	9:47
ST-SB01 0-20	0812255-7		SOIL	24-Sep-08	8:42
ST-SB06 100-120	0812255-8		SOIL	23-Oct-08	10:32
ST-SB06 160-180	0812255-9		SOIL	23-Oct-08	14:52
ST-SB01 220-235.5	0812255-10		SOIL	26-Sep-08	11:12
ST-SB01 237-255.5	0812255-11		SOIL	26-Sep-08	12:32
ET-SB01 0-20	0812255-12		SOIL	17-Sep-08	16:03
ST-SB06 280-300	0812255-13		SOIL	28-Oct-08	9:47
ST-SB06 260-280	0812255-14		SOIL	28-Oct-08	9:07
ST-SB06 60-80	0812255-15		SOIL	22-Oct-08	10:27
ET-SB02 0-20	0812255-16		SOIL	19-Sep-08	9:55
ET-SB02 50-60	0812255-17		SOIL	19-Sep-08	14:17
ET-SB01 80-100	0812255-18		SOIL	18-Sep-08	15:20
ST-SB06 80-100	0812255-19		SOIL	23-Oct-08	9:52
ST-SB06 120-140	0812255-20		SOIL	23-Oct-08	11:07
ST-SB01 200-220	0812255-21		SOIL	26-Sep-08	10:02
ET-SB01 60-80	0812255-22		SOIL	18-Sep-08	14:05
ET-SB02 40-50	0812255-23		SOIL	19-Sep-08	13:45
ST-SB06 300-320D	0812255-24		SOIL	28-Oct-08	13:52



PARAGON
ANALYTICAL

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812255

Date: 12-23-08 Page 1 of 3

Project Name/No.: EMI-VIRP Sample(s): K. Williams Turnaround (circle one): Standard or Rush (Due 12-23-08) Date 12-23-08 or Return to Client

Report To: Steven Laughlin
Phone: (520) 407-2875
Fax:

E-mail: steven_laughlin@uscorp.com
Company: Freight McMoran
Address: 6200 W Duval Mine Rd.
Green Valley

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time	Lab ID	Matrix	Preservative	No. of Containers	Indicate type (HCl, etc.)	VOCs	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics	TCLP Metals	Total Metals by ICP/Hg	Dissolved Metals by ICP/Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes
ST-SB06-20-40	10/21/08	1437	①	S	n/a	1																													
ST-SB06-300-320	10/28/08	1333	②	S	n/a	1																													
ST-SB01-20-40	9/8/08	1135	③	S	n/a	1																													
ET-SB01-40-60	9/8/08	1210	④	S	n/a	1																													
ST-SB06-300-320	10/28/08	1333	⑤	S	n/a	1																													
ST-SB06-250-240	10/21/08	1452	⑥	S	n/a	1																													
ST-SB01-40-60	9/24/08	0947	⑦	S	n/a	1																													
ST-SB01-0-20	9/24/08	0842	⑧	S	n/a	1																													
ST-SB06-100-120	10/23/08	1032	⑨	S	n/a	1																													
ST-SB06-160-180	10/23/08	1452	⑩	S	n/a	1																													

Comments: Order # 0508VT
Report No. 0508VT
Fedex 797207317863

Relinquished By: (1) Signature Kevin Walsh Printed Name Kevin Walsh Date 12-23-08 Time 1600 Company URS

Relinquished By: (2) Signature _____ Printed Name _____ Date _____ Time _____ Company _____

Received By: (1) Signature Cheryl Trimble Printed Name Cheryl Trimble Date 12-30-08 Time 1025 Company ALS Paragon

Received By: (2) Signature _____ Printed Name _____ Date _____ Time _____ Company _____

Form 202-6.xls (6/16/06)

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JEWorkorder No: 0812255Initials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>(NO)</u>
2. Are custody seals on shipping containers intact?	NONE	<u>(YES)</u> NO
3. Are Custody seals on sample containers intact?	<u>(NONE)</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>(YES)</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>(YES)</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>(NO)</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>(YES)</u> NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<u>(N/A)</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<u>(N/A)</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>(NO)</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>(YES)</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>(YES)</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	<u>CT 12-30-08</u> <u>(YES)</u>	<u>(NO)</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>(N/A)</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<u>(N/A)</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>(N/A)</u>	YES NO
17. Were the samples shipped on ice?	YES	<u>(NO)</u>
18. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #2 #4	<u>(RAD ONLY)</u> YES <u>(NO)</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>(YES)</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

COC SAYS ST-SB01-20-40 label reads ET-SB01-20-40 - Times ARE both 1135 - ^{used} _{COG}
 COC READS ST-SB06-208-300 label reads ST-SB06 Lid HAS 280-300 Times both 947
 ST-SB06-260-280 has an MSD bottle
 Broken Lids: 0812255-13 and -18 - no visible leakage
 All bottles are limited volume

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: _____Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812255

Page 1 of 1

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL5111208/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/NET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

12
-1

Delivery Address Bar Code



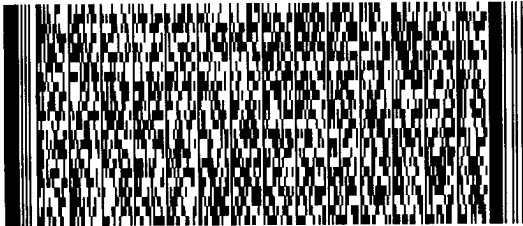
Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

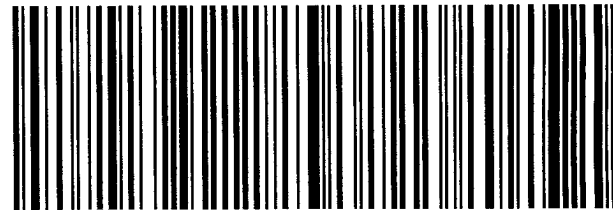


MPS# 3 of 3
 0263 7972 0731 7863
 Mstr# 7962 1083 7711 0201

TUE - 30DEC AA
 STANDARD OVERNIGHT

XH FTCA

80524
 CO-US
 DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090223-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Feb-09

Date Prepared: 23-Feb-09

Date Analyzed: 07-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 1000 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.0067 +/- 0.0083	0.0052	0.1	B3
15117-96-1	U-235	0.0040 +/- 0.0097	0.0054	0.1	U
7440-61-1	U-238	0.010 +/- 0.0096	0.012	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.331	3.43	pCi/g	79.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812255-1

Date Printed: Friday, March 20, 2009

ALS Paragon
LIMS Version: 6.252A

Page 1 of 2

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090225-3MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 25-Feb-09

Date Prepared: 25-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 360 minutes

Final Aliquot: 1.03 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	-0.00038 +/- 0.018	0.036	0.1	U
15117-96-1	U-235	-0.0040 +/- 0.021	0.037	0.1	U
7440-61-1	U-238	-0.00038 +/- 0.018	0.036	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.369	3.78	pCi/g	86.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090223-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Feb-09

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.05 +/- 0.742	0.0533	4.16	97.4	82 - 122	P
7440-61-1	U-238	4.28 +/- 0.779	0.0687	4.32	98.9	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.331	3.63	pCi/g	83.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812255-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

Page 1 of 2

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090225-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 25-Feb-09

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Final Aliquot: 1.03 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.29 +/- 0.774	0.0445	4.20	102	82 - 122	P
7440-61-1	U-238	4.54 +/- 0.815	0.0300	4.36	104	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.369	3.56	pCi/g	81.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812255-1

Date Printed: Friday, March 20, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 220-240

Lab ID: 0812255-5DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.7 +/- 0.34	2.0 +/- 0.40	0.68	2.13	
15117-96-1	U-235	0.071 +/- 0.050	0.14 +/- 0.068	0.87	2.13	
7440-61-1	U-238	1.6 +/- 0.32	1.9 +/- 0.39	0.79	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 60-80
Lab ID:	0812255-15DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 22-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.9 +/- 0.53	2.1 +/- 0.43	1.12	2.13	
15117-96-1	U-235	0.13 +/- 0.061	0.050 +/- 0.044	1.02	2.13	U
7440-61-1	U-238	2.6 +/- 0.49	2.0 +/- 0.40	1.00	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 20-40
Lab ID:	0812255-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 21-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.035	0.1	
15117-96-1	U-235	0.060 +/- 0.041	0.025	0.1	LT
7440-61-1	U-238	1.7 +/- 0.34	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.410	3.83	pCi/g	86.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 300-320
Lab ID:	0812255-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.75 +/- 0.19	0.034	0.1	
15117-96-1	U-235	0.053 +/- 0.041	0.020	0.1	LT
7440-61-1	U-238	0.91 +/- 0.22	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.411	3.12	pCi/g	70.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 20-40
Lab ID:	0812255-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 18-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.015	0.1	
15117-96-1	U-235	0.12 +/- 0.060	0.034	0.1	
7440-61-1	U-238	2.2 +/- 0.43	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.428	3.81	pCi/g	86.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB01 40-60
Lab ID:	0812255-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 18-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 360 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.42	0.073	0.1	
15117-96-1	U-235	0.13 +/- 0.083	0.079	0.1	
7440-61-1	U-238	2.4 +/- 0.52	0.098	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.449	2.01	pCi/g	45.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 220-240
Lab ID:	0812255-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.056	0.1	
15117-96-1	U-235	0.071 +/- 0.050	0.062	0.1	LT
7440-61-1	U-238	1.6 +/- 0.32	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.445	3.57	pCi/g	80.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 220-240

Lab ID: 0812255-5DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.064	0.1	
15117-96-1	U-235	0.14 +/- 0.068	0.037	0.1	
7440-61-1	U-238	1.9 +/- 0.39	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.381	3.53	pCi/g	80.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 40-60
Lab ID:	0812255-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.043	0.1	
15117-96-1	U-235	0.099 +/- 0.055	0.047	0.1	LT
7440-61-1	U-238	1.9 +/- 0.37	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.396	3.96	pCi/g	90.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 0-20
Lab ID:	0812255-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.45	0.050	0.1	
15117-96-1	U-235	0.17 +/- 0.074	0.051	0.1	
7440-61-1	U-238	2.2 +/- 0.42	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.339	3.83	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 100-120
Lab ID:	0812255-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.045	0.1	
15117-96-1	U-235	0.12 +/- 0.062	0.049	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.420	3.98	pCi/g	90.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 160-180
Lab ID:	0812255-9

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 360 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.43	0.065	0.1	
15117-96-1	U-235	0.10 +/- 0.077	0.087	0.1	
7440-61-1	U-238	1.6 +/- 0.37	0.065	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.384	1.78	pCi/g	40.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 220-235.5
Lab ID:	0812255-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 26-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.39	0.069	0.1	
15117-96-1	U-235	0.10 +/- 0.067	0.051	0.1	
7440-61-1	U-238	1.9 +/- 0.41	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.393	2.71	pCi/g	61.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 237-255.5
Lab ID:	0812255-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 26-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.99 +/- 0.22	0.055	0.1	
15117-96-1	U-235	0.036 +/- 0.038	0.062	0.1	U
7440-61-1	U-238	1.0 +/- 0.23	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.466	3.92	pCi/g	87.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB01 0-20
Lab ID:	0812255-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.37	0.090	0.1	
15117-96-1	U-235	0.085 +/- 0.055	0.054	0.1	LT
7440-61-1	U-238	1.8 +/- 0.37	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.455	3.29	pCi/g	73.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 280-300
Lab ID:	0812255-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.25	0.065	0.1	
15117-96-1	U-235	0.077 +/- 0.048	0.035	0.1	LT
7440-61-1	U-238	1.4 +/- 0.29	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.482	3.99	pCi/g	89.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 260-280	Sample Matrix: SOIL	Prep Batch: AS090225-3	Final Aliquot: 1.02 g
Lab ID: 0812255-14	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090225-3-1	Prep Basis: Dry Weight
	Date Collected: 28-Oct-08	Run ID: AS090225-3A	Moisture(%): NA
	Date Prepared: 25-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 06-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.054	0.1	
15117-96-1	U-235	0.092 +/- 0.053	0.035	0.1	LT
7440-61-1	U-238	1.8 +/- 0.35	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.423	3.91	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 60-80
Lab ID:	0812255-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 22-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.10 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.53	0.038	0.1	
15117-96-1	U-235	0.13 +/- 0.061	0.039	0.1	
7440-61-1	U-238	2.6 +/- 0.49	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.111	3.69	pCi/g	89.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 60-80

Lab ID: 0812255-15DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 22-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.062	0.1	
15117-96-1	U-235	0.050 +/- 0.044	0.055	0.1	U
7440-61-1	U-238	2.0 +/- 0.40	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.310	3.27	pCi/g	76.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 0-20
Lab ID:	0812255-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 19-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.15 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.061	0.1	
15117-96-1	U-235	0.10 +/- 0.062	0.059	0.1	
7440-61-1	U-238	2.1 +/- 0.43	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	3.933	2.72	pCi/g	69.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 50-60
Lab ID:	0812255-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 19-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.26	0.045	0.1	
15117-96-1	U-235	0.16 +/- 0.074	0.039	0.1	
7440-61-1	U-238	1.0 +/- 0.23	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.220	3.21	pCi/g	76.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB01 80-100
Lab ID:	0812255-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 18-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.80 +/- 0.18	0.014	0.1	
15117-96-1	U-235	0.029 +/- 0.028	0.032	0.1	U
7440-61-1	U-238	0.87 +/- 0.20	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.462	4.03	pCi/g	90.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 80-100
Lab ID:	0812255-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.36	0.039	0.1	
15117-96-1	U-235	0.12 +/- 0.064	0.038	0.1	
7440-61-1	U-238	1.7 +/- 0.35	0.017	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.37	pCi/g	76.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 120-140
Lab ID:	0812255-20

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.028	0.1	
15117-96-1	U-235	0.094 +/- 0.051	0.017	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.489	3.88	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 200-220
Lab ID:	0812255-21

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 26-Sep-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.043	0.1	
15117-96-1	U-235	0.065 +/- 0.047	0.051	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.457	3.75	pCi/g	84.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB01 60-80
Lab ID:	0812255-22

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 18-Sep-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.84 +/- 0.22	0.075	0.1	
15117-96-1	U-235	0.00089 +/- 0.032	0.063	0.1	U
7440-61-1	U-238	0.80 +/- 0.21	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.338	2.87	pCi/g	66.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Field ID: ET-SB02 40-50	Sample Matrix: SOIL	Prep Batch: AS090223-1	Final Aliquot: 1.01 g
Lab ID: 0812255-23	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090223-1-1	Prep Basis: Dry Weight
	Date Collected: 19-Sep-08	Run ID: AS090223-1A	Moisture(%): NA
	Date Prepared: 23-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.42	0.018	0.1	
15117-96-1	U-235	0.096 +/- 0.059	0.049	0.1	LT
7440-61-1	U-238	2.0 +/- 0.40	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.482	3.53	pCi/g	78.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 300-320D	Sample Matrix: SOIL	Prep Batch: AS090223-1	Final Aliquot: 1.06 g
Lab ID: 0812255-24	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090223-1-1	Prep Basis: Dry Weight
	Date Collected: 28-Oct-08	Run ID: AS090223-1A	Moisture(%): NA
	Date Prepared: 23-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.86 +/- 0.22	0.052	0.1	
15117-96-1	U-235	0.023 +/- 0.035	0.062	0.1	U
7440-61-1	U-238	1.0 +/- 0.26	0.065	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.273	2.50	pCi/g	58.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812255

1. The following report consists of analytical results and supporting documentation for 22 soil samples received by ALS Paragon on 12/30/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812255-13 and -14 were sealed in steel cans on 01/07/09 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/28/09 is at least 97.78%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.89%.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/28/09.
4. The results for these samples are reported on a “Dry Weight” basis in units of pCi/gram.
5. Sample volume was insufficient to allow preparation of duplicates in batches GS090108-3 and GS090109-7. Duplicate analyses of samples 0812255-1, -11, and -14 were performed in lieu of prepared duplicates.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples. This is applicable for samples 0812255-13 and -14.
7. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium. This is applicable for samples 0812255-13 and -14.



8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. The requested detection limit of 1.0 pCi/gram for ^{228}Ra was not met for samples 0812255-3, -4, -7, -8, -10, -11DUP, -12, -16, -18, -23, and -24. The reported activities are greater than the achieved detection limits. The results have been flagged with a "M3" qualifier on the final reports. The results are submitted without further qualification.
11. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Lara Orban 02/19/09
Lara Orban Date
Radiochemistry Primary Data Reviewer

Michael Stipan 2-19-09
Radiochemistry Final Data Reviewer Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812255

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ST-SB06 20-40	0812255-1		SOIL	21-Oct-08	14:37
ST-SB06 300-320	0812255-2		SOIL	28-Oct-08	13:52
ST-SB01 20-40	0812255-3		SOIL	18-Sep-08	11:35
ET-SB01 40-60	0812255-4		SOIL	18-Sep-08	12:10
ST-SB06 220-240	0812255-5		SOIL	24-Oct-08	14:52
ST-SB01 40-60	0812255-6		SOIL	24-Sep-08	9:47
ST-SB01 0-20	0812255-7		SOIL	24-Sep-08	8:42
ST-SB06 100-120	0812255-8		SOIL	23-Oct-08	10:32
ST-SB06 160-180	0812255-9		SOIL	23-Oct-08	14:52
ST-SB01 220-235.5	0812255-10		SOIL	26-Sep-08	11:12
ST-SB01 237-255.5	0812255-11		SOIL	26-Sep-08	12:32
ET-SB01 0-20	0812255-12		SOIL	17-Sep-08	16:03
ST-SB06 280-300	0812255-13		SOIL	28-Oct-08	9:47
ST-SB06 260-280	0812255-14		SOIL	28-Oct-08	9:07
ST-SB06 60-80	0812255-15		SOIL	22-Oct-08	10:27
ET-SB02 0-20	0812255-16		SOIL	19-Sep-08	9:55
ET-SB02 50-60	0812255-17		SOIL	19-Sep-08	14:17
ET-SB01 80-100	0812255-18		SOIL	18-Sep-08	15:20
ST-SB06 80-100	0812255-19		SOIL	23-Oct-08	9:52
ST-SB06 120-140	0812255-20		SOIL	23-Oct-08	11:07
ST-SB01 200-220	0812255-21		SOIL	26-Sep-08	10:02
ET-SB01 60-80	0812255-22		SOIL	18-Sep-08	14:05
ET-SB02 40-50	0812255-23		SOIL	19-Sep-08	13:45
ST-SB06 300-320D	0812255-24		SOIL	28-Oct-08	13:52



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812255

Date: 12-23-08 Page 1 of 3

Project Name/No.: EMI-VIRP Sample(s): K. Williams Turnaround (circle one): Standard or Rush (Due 12-23-08) Date 12-23-08 or Return to Client

Report To: Steven Laughlin
Phone: (520) 407-2875
Fax:

E-mail: steven_laughlin@uscorp.com
Company: Freight McMoran
Address: 6200 W Duval Mine Rd.
Green Valley

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time*	Lab ID	Matrix	Preservative	(Indicate type: HCl, etc.)	No. of Containers
ST-SB06-20-40	10/21/08	1437	①	S	n/a		1
ST-SB06-300-320	10/28/08	1333	②	S	n/a		1
ST-SB01-20-40	9/8/08	1135	③	S	n/a		1
ET-SB01-40-60	9/8/08	1210	④	S	n/a		1
ST-SB06-300-320	10/28/08	1333	⑤	S	n/a		1
ST-SB06-250-240	10/21/08	1452	⑥	S	n/a		1
ST-SB01-40-60	9/24/08	0947	⑦	S	n/a		1
ST-SB01-0-20	9/24/08	0842	⑧	S	n/a		1
ST-SB06-100-120	10/23/08	1032	⑨	S	n/a		1
ST-SB06-160-180	10/23/08	1452	⑩	S	n/a		1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order #
Report No. 0508VT

Fedex 797207317863

VOCs	SW8260B	BTEX (only)	SW8021B	SVOCs	SW8270C	OC Pesticides	SW8081A	PCBs	SW8082	Herbicides	SW8151A	Explosives	SW8330	TCLP Organics	SW1311	TCLP Metals	SW1311	Hg	SW6010B	7470	E200	7	Total Metals	by ICP/MS	SW6020A	E200	8	Dissolved Metals	by ICP/MS	SW6020A	E200	8	Hexavalent Chromium	SW7196A	Alkaline Digest?	Y / N	Inorganic Anions	SW9056	E300	0	(specify in comments)	Solids:	Total	E160.3	TDS	E160.1	TSS	E160.2	pH	SW9040B	SW9045C	TPH	SW8015B	GRO	DRO	(circle one or both)	Gross Alpha / Beta	SW9310	E900	0	Actinides	by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906	0	Total Alpha-Emitting Radium	SW9315	E903	0	Radium 226	E903	1	Radium 228	SW9320	E904	0	Strontium 90 (Total RadioSr)	DS811	00	Gamma Isotopes	E901	1	Radon 222	SM7510RN	Uranium Isotopes	234, 235, 238																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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Relinquished By:	Signature <u>[Signature]</u>	Printed Name <u>Kevin Walsh</u>	Date <u>12-23-08</u>	Time <u>1600</u>	Company <u>URS</u>
Relinquished By:	Signature <u>[Signature]</u>	Printed Name <u>Cheryl Trimble</u>	Date <u>12-30-08</u>	Time <u>1025</u>	Company <u>ALS Paragon</u>



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812255

Date: 12-23-08 Page 2 of 3

Project Name/No.: <u>EM1-VRP</u>	Sampler(s): <u>K. Walsh</u>	Turnaround (circle one): <u>Standard</u> or Rush (Due _____)	Dispose: <u>Recycle</u> or Return to Client				
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: E-mail: Steven.Vaughn@wscorp.com Company: Freeport McMoran Address: 6200 W Duval Mine Rd. Green Valley, AZ 85614							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers	Circle method (right); provide additional information as needed (comments).
ST-SBC1-220-35	9/26/08	1112	10	S	N/A	1	
ST-SBC1-237-255.5	9/26/08	1232	11	S	N/A	1	
ET-SBC1-0-20	9/17/08	1603	12	S	N/A	1	
ST-SBC6 280-300	9/28/08	0947	13	S	N/A	1	
ST-SBC6 260-280	9/28/08	0907	14	S	N/A	1	
ST-SBC6 60-80	9/12/08	1027	15	S	N/A	1	
ET-SBC2-0-20	9/19/08	0955	16	S	N/A	1	
ET-SBC2-50-60	9/19/08	1417	17	S	N/A	1	
ET-SBC1-80-100	9/16/08	1520	18	S	N/A	1	
ST-SBC6-80-100	9/23/08	0952	19	S	N/A	1	
Comments: <u>Order No. 0548VT</u>							
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Relinquished By: <u>Kevin Walsh</u>							(1)
Signature: _____							
Printed Name: <u>Kevin Walsh</u>							
Date: <u>12-23-08</u> Time: <u>1600</u>							
Company: <u>URS</u>							
Relinquished By: _____							(2)
Signature: _____							
Printed Name: _____							
Date: _____ Time: _____							
Company: _____							
Received By: <u>Cheryl Trimble</u>							(1)
Signature: _____							
Printed Name: <u>Cheryl Trimble</u>							
Date: <u>12-30-08</u> Time: <u>1025</u>							
Company: <u>ALS Paragon</u>							
Received By: _____							(2)
Signature: _____							
Printed Name: _____							
Date: _____ Time: _____							
Company: _____							

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JEWorkorder No: 0812255Initials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<u>(NO)</u>
2. Are custody seals on shipping containers intact?	NONE	<u>(YES)</u> NO
3. Are Custody seals on sample containers intact?	<u>(NONE)</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>(YES)</u>	YES NO
5. Are the COC and bottle labels complete and legible ?	<u>(YES)</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>(NO)</u>
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>(YES)</u> NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<u>(N/A)</u>	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<u>(N/A)</u>	YES NO
10. Is there sufficient sample for the requested analyses?	YES	<u>(NO)</u>
11. Were all samples placed in the proper containers for the requested analyses?	<u>(YES)</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>(YES)</u>	YES NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<u>CT 12-30-08</u> <u>(YES)</u>	<u>(NO)</u>
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<u>(N/A)</u>	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<u>(N/A)</u>	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<u>(N/A)</u>	YES NO
17. Were the samples shipped on ice ?	YES	<u>(NO)</u>
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<u>(RAD ONLY)</u>	YES <u>(NO)</u>
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <u>(YES)</u> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

COC SAYS ST-SB01-20-40 LABEL READS ET-SB01-20-40 - TIMES ARE BOTH 1135 - ^{used} ^{COC} ₁₀

COC READS ST-SB06-208-300 LABEL READS ST-SB06 LID HAS 280-300 TIMES BOTH 947

ST-SB06-260-280 HAS AN MSD BOTTLE

Broken Lids: 0812255-13 and -18 - no visible leakage

All bottles are limited volume

If applicable, was the client contacted? YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

0812255

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL511208/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/NET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

12
-1

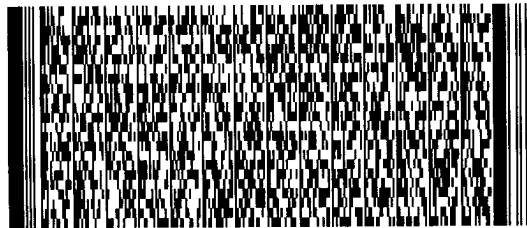
Delivery Address Bar Code



SHIP TO: (907) 443-1511 **BILL SENDER**
Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

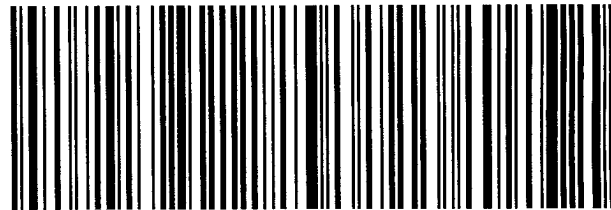


MPS# 3 of 3
 0263 7972 0731 7863
 Mstr# 7962 1083 7711 0201

TUE - 30DEC AA
STANDARD OVERNIGHT

XH FTCA

80524
CO-US
DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090108-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 60 minutes

Final Aliquot: 80.6 g

Result Units: pCi/g

File Name: 090151d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.096 +/- 0.35	0.63	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-7MB

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 45 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090171d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.21 +/- 0.21	0.32	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-7MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 45 minutes

Final Aliquot: 171 g

Result Units: pCi/g

File Name: 090171d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.045 +/- 0.34	0.68	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090108-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090188d06

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1060 +/- 125	17.9	986	107	85 - 115	P
10198-40-0	Co-60	464 +/- 54.4	1.16	455	102	85 - 115	P
10045-97-3	Cs-137	390 +/- 45.7	1.79	374	104	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-7ALCS

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090132d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	451 +/- 52.9	2.61	470	96.0	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-7LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090134d04

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	482 +/- 57.1	7.16	462	104	85 - 115	P
10198-40-0	Co-60	210 +/- 24.6	0.831	213	98.3	85 - 115	P
10045-97-3	Cs-137	181 +/- 21.4	1.18	175	104	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 260-280

Lab ID: 0812255-14DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090133d04A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.1 +/- 0.39	2.0 +/- 0.37	0.04	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 20-40
Lab ID: 0812255-1DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 21-Oct-08
Date Prepared: 07-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3
QCBatchID: GS090108-3-1
Run ID: GS090108-3A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 73.7 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090176d06

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	0.82 +/- 0.60	1.3 +/- 0.48	0.64	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 237-255.5

Lab ID: 0812255-11DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 26-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090133d07

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.6 +/- 0.65	1.6 +/- 0.97	0.01	2.13	M3,G,TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 260-280

Lab ID: 0812255-14DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090133d04

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.2 +/- 0.53	1.1 +/- 0.47	0.14	2.13	TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 20-40

Lab ID: 0812255-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 21-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 73.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090098d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.82 +/- 0.60	0.88	1	U,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 20-40

Lab ID: 0812255-1DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 21-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 73.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090176d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.48	0.90	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 300-320

Lab ID: 0812255-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 60 minutes

Report Basis: Dry Weight

Final Aliquot: 78.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090136d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.87 +/- 0.39	0.82	1	LT,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 20-40
Lab ID:	0812255-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 18-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090138d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.75	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB01 40-60

Lab ID: 0812255-4

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 18-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 75.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090124d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.75	1.4	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 220-240

Lab ID: 0812255-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090139d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.81	0.90	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 40-60

Lab ID: 0812255-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 75.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090177d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.69	0.79	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 0-20

Lab ID: 0812255-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 73.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090126d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.86	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 100-120

Lab ID: 0812255-8

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 73.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090140d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.84	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 160-180
Lab ID:	0812255-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 82.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090179d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.0 +/- 0.47	0.78	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 220-235.5

Lab ID: 0812255-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 26-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 72.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090142d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.75	1.0	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 237-255.5

Lab ID: 0812255-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 26-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090143d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.65	0.89	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 237-255.5

Lab ID: 0812255-11DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 26-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090133d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.97	1.4	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB01 0-20

Lab ID: 0812255-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090144d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.72	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 280-300
Lab ID:	0812255-13

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 181 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.37	0.41	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 280-300
Lab ID:	0812255-13

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 181 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.70	0.86	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 260-280

Lab ID: 0812255-14

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090170d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.39	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 260-280

Lab ID: 0812255-14DUP

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090133d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.37	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 260-280

Lab ID: 0812255-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090170d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.53	0.93	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 260-280

Lab ID: 0812255-14DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090133d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.47	0.71	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 60-80

Lab ID: 0812255-15

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 22-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 97.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090146d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.62	0.98	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 0-20
Lab ID:	0812255-16

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 89.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.84	1.1	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB01 80-100

Lab ID: 0812255-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 18-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090149d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.57	1.1	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 120-140
Lab ID:	0812255-20

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 75.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090185d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.56	0.89	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 200-220

Lab ID: 0812255-21

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 26-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 60 minutes

Report Basis: Dry Weight

Final Aliquot: 74.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090136d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.46	0.86	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB01 60-80

Lab ID: 0812255-22

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 18-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 101 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090150d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.53	0.75	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 40-50

Lab ID: 0812255-23

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090186d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.68	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 300-320D

Lab ID: 0812255-24

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090187d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.66	1.0	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1



March 30, 2009

Mr. Aaron Hilshorst
Freeport McMoRan Sierrita
6200 W. Duval Mine Road
Green Valley AZ 85614

Re: ALS Paragon Workorder: 08-12-258
Client Project Name: FMI-VRP
Client Project Number: None Submitted

Dear Mr. Hilshorst:

Thirty soil samples were received from Freeport McMoRan Sierrita on December 30, 2008. The samples were scheduled for the following analyses:


Isotopic Uranium pages 1-48
Gamma Spectroscopy pages 1-66

Radium-228 by Method 9320 pages 1-14
226Radium by EPA Method 903.1 (m) pages 1-35

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in ALS Paragon. Should you have any questions, please call.

Sincerely,



ALS Paragon
Julie Ellingson
Project Manager

JME/eh
Enclosure (s): Report

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812258

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
EM-JS-07-5-7	0812258-1		SOIL	13-Aug-08	9:19
EM-JS-06-0-1	0812258-2		SOIL	13-Aug-08	8:40
EM-JS-06-1-3	0812258-3		SOIL	13-Aug-08	8:40
EM-JS-07-1-3	0812258-4		SOIL	13-Aug-08	9:14
EM-JS-06-5-7	0812258-5		SOIL	13-Aug-08	8:45
EM-JS-06-10-11	0812258-6		SOIL	13-Aug-08	8:50
CS-JS-02-10-11	0812258-7		SOIL	04-Aug-08	14:33
RA-JS-02-1-3	0812258-8		SOIL	11-Aug-08	10:45
RA-JS-02-0-1 D	0812258-9		SOIL	11-Aug-08	10:25
RA-SD-02-1.5-3.0 D	0812258-10		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5 D	0812258-11		SOIL	11-Aug-08	9:50
RA-SD-01-1.5-3.0 D	0812258-12		SOIL	11-Aug-08	10:05
EM-JS-07-15-16	0812258-13		SOIL	13-Aug-08	8:45
EM-JS-08-5-7	0812258-14		SOIL	12-Aug-08	1:33
EM-JS-08-10-12	0812258-15		SOIL	12-Aug-08	1:56
C-JS-05-1-3	0812258-16		SOIL	05-Aug-08	11:05
EM-JS-07-10-12	0812258-17		SOIL	13-Aug-08	9:45
RA-SD-02-0-1.5D	0812258-18		SOIL	11-Aug-08	9:10
ST-SB03 80-100	0812258-19		SOIL	02-Oct-08	14:17
ST-SB04 120-140	0812258-20		SOIL	06-Oct-08	9:22
ST-SB03 180-200	0812258-21		SOIL	03-Oct-08	12:27
ST-SB03 60-80	0812258-22		SOIL	02-Oct-08	13:32
ST-SB04 100-120	0812258-23		SOIL	06-Oct-08	8:37
ST-SB03 100-120	0812258-24		SOIL	03-Oct-08	8:57
ST-SB03 20-40	0812258-25		SOIL	02-Oct-08	12:47
ST-SB03 120-140	0812258-26		SOIL	03-Oct-08	9:37
ST-SB03 160-180	0812258-27		SOIL	03-Oct-08	11:42
ST-SB03 40-60	0812258-28		SOIL	02-Oct-08	13:07
ST-SB03 140-160	0812258-29		SOIL	03-Oct-08	10:22
ST-SB01 140-160	0812258-30		SOIL	25-Sep-08	13:17



Project Name/No.: <u>AME-UPP</u> Sampler(s): <u>K. L. L. L. L.</u> Turnaround (circle one): <u>Standard</u> or Rush (Due <u> </u>) Dispose: <u>Date 12-22-08</u> or Return to Client <u> </u>	
Report To: <u>Steven Vaughan</u> Phone: <u>(520) 407-2845</u> Fax: <u> </u> E-mail: <u>Steven.van@urcorp.com</u> Company: <u>Freeport McMoran</u> Address: <u>6200 W. Duval Mine Rd.</u> <u>Green Valley, AZ 85614</u>	
Circle method (right); provide additional information as needed (comments).	
Sample ID	Date Time
Lab ID	Matrix
Preservative	(Indicate type: HCl, etc.)
No. of Containers	
VOCs	SW8260B
BTEX (only)	SW8021B
SVOCs	SW8270C
OC Pesticides	SW8081A
PCBs	SW8082
Herbicides	SW8151A
Explosives	SW8330
TCLP Organics	SW8260B 8270C 8081A 8151A
TCLP Metals	SW8010B 7470
Total Metals by ICP Hg	SW8010B 7470 7471 E200.7
Dissolved Metals by ICP Hg	SW8010B 7470 E200.7
Total Metals by ICPMS	SW8020A E200.8
Dissolved Metals by ICPMS	SW8020A E200.8
Hexavalent Chromium	SW7196A Alkaline Digest? Y / N
Inorganic Anions	SW9056 E300.0 (specify in comments)
Solids:	Total E160.3 TDS E160.1 TSS E160.2
pH	SW9040B SW9045C
TPH	SW8015B GRO DRO (circle one or both)
Gross Alpha / Beta	SW9310 E900.0
Actinides by Paragon SOP	Pu / U / Am / Th / Cm /
Tritium	E906.0
Total Alpha-Emitting Radium	SW9315 E903.0
Radium 226	E903.1
Radium 228	SW9320 E904.0
Strontium 90 (Total RadioSr)	DS811-00
Gamma Isotopes	E901.1
Radon 222	SM7510Rn
Uranium Isotopes	234, 235, 238

(1) Relinquished By:		(2) Relinquished By:	
Signature <u>Kevin L. L.</u>	Signature <u> </u>	Signature <u> </u>	Signature <u> </u>
Printed Name <u>Kevin L. L.</u>	Printed Name <u> </u>	Printed Name <u> </u>	Printed Name <u> </u>
Date <u>12-22-08</u>	Date <u> </u>	Date <u> </u>	Date <u> </u>
Time <u>1600</u>	Time <u> </u>	Time <u> </u>	Time <u> </u>
Company <u>URS</u>	Company <u> </u>	Company <u> </u>	Company <u> </u>
(1) Received By:		(2) Received By:	
Signature <u>Cheryl Trimble</u>	Signature <u> </u>	Signature <u> </u>	Signature <u> </u>
Printed Name <u>Cheryl Trimble</u>	Printed Name <u> </u>	Printed Name <u> </u>	Printed Name <u> </u>
Date <u>12-30-08</u>	Date <u> </u>	Date <u> </u>	Date <u> </u>
Time <u>1005</u>	Time <u> </u>	Time <u> </u>	Time <u> </u>
Company <u>ALS Paragon</u>	Company <u> </u>	Company <u> </u>	Company <u> </u>

Form 202r6.xls (6/16/06)

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 050807

Index 7962 10037711



Project Name/No.: Fml-VRP
 Sampler(s): R. Vukich
 Turnaround (circle one): Standard or Rush (Due _____)
 Disposal: Date 6/29/08 or Return to Client _____

Report To: Steven Vaughan

Phone: (520) 407-2845

Fax:

E-mail: steven_vanahnc@wscorp.com

Company: Frederick McDermott

Address: 6200 W Duval Mile Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments):

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	VOCs	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Sr-90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes		
RA-SD-01-0-1-5D	8/1/08	945	11	S	n/a	1																					X	X						
RA-SD-01-1-5-3C D	8/1/08	1005	12	S	n/a	1																					X	X						
EM-JS-07-15-16	8/13/08	945	13	S	n/a	1																					X	X						
EM-JS-08-5-7	8/12/08	9133	14	S	n/a	1																					X	X						
EM-JS-08-10-12	8/12/08	9015	15	S	n/a	1																					X	X						
C-JS-05-1-3	8/5/08	1108	16	S	n/a	1																					X	X						
EM-JS-07-10-12	8/13/08	945	17	S	n/a	1																					X	X						
RA-SD-02-0-1-5D	8/16/08	910	18	S	n/a	1																					X	X						
ST-SB03-20-100	10/2/08	1417	19	S	n/a	1																					X	X						
ST-SB04-120-140	10/6/08	922	20	S	n/a	1																					X	X						

Time Zone:	EST	CST	MST	PST	Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter	(1) Relinquished By:	(2)
Comments:						Signature	Signature
						<i>K. L. L.</i>	

Order No. 0548VT

Fedex 796210837711



PARAGON ANALYTICS
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS LABORATORY GROUP
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812258

Date: 12-22-08 Page 3 of 3

Project Name/No.: FM1-URP				Sampler(s): K. K. K. K. K.				Turnaround (circle one): Standard or Rush (Due)				Disposer Date to day or Return to Client																						
Report To: Steven Vaughan Phone: (520) 407-2845 Fax: E-mail: Steven.Vaughan@paragoncorp.com Company: Freeport McMoran Address: 6200 W. Duval Mine Rd Green Valley, AZ 85614												Circle method (right); provide additional information as needed (comments).																						
Sample ID	Date	Time *	Lab ID	Matrix	Preservative	No. of Containers	VOCs	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Sr-90 (Total Radio)	Gamma Isotopes	Radon 222	Uranium Isotopes 234, 235, 238
ST-SB03 180-200	10/3/08	1227	20	S	N/A	1																												
ST-SB03 60-80	10/2/08	1332	20	S	N/A	1																												
ST-SB04 100-120	10/6/08	837	20	S	N/A	1																												
ST-SB03 100-120	10/3/08	857	20	S	N/A	1																												
ST-SB03 20-40	10/2/08	1247	20	S	N/A	1																												
ST-SB03 120-140	10/3/08	937	20	S	N/A	1																												
ST-SB03 160-180	10/3/08	1142	20	S	N/A	1																												
ST-SB03 40-60	10/2/08	1307	20	S	N/A	1																												
ST-SB03-140-160	10/3/08	1022	20	S	N/A	1																												
ST-SB01-140-160	10/25/08	1317	20	S	N/A	1																												

Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 0508VT

Feder 796210837711

(1) Relinquished By:				(2) Relinquished By:			
Signature: Ken L. L.				Signature: _____			
Printed Name: Ken L. L.				Printed Name: _____			
Date: 12-22-08 Time: 1600				Date: _____ Time: _____			
Company: URS				Company: _____			
(1) Received By:				(2) Received By:			
Signature: Cheryl Trimble				Signature: _____			
Printed Name: Cheryl Trimble				Printed Name: _____			
Date: 12-30-08 Time: 1025				Date: _____ Time: _____			
Company: ALS Paragon				Company: _____			

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812258Project Manager: JEInitials: COTDate: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF <input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES ^{CT} <u>12-31-08</u>	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES ^{CT} <u>12-31-08</u>	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>12</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Broken lids: 0812258-1 No visible leakage-13-28All samples have limited volume-29-30If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick SmithDate/Time: Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
Rick Smith
URS Corporation
333 E. Wetmore Rd
Suite 400
Tucson, AZ 85705



JCL511208/20/23

Ship Date: 29DEC08
ActWgt: 16.7 LB
CAD: 9880693/INET8091
Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



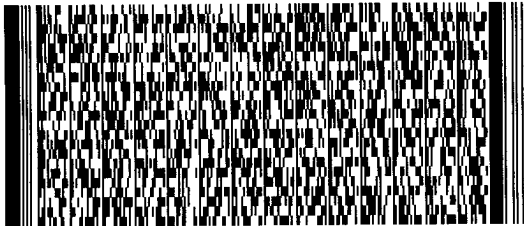
Ref # 24096838.54210.10013
Invoice #
PO #
Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



1 of 3

TUE - 30DEC

AA

TRK# 7962 1083 7711

0201

STANDARD OVERNIGHT

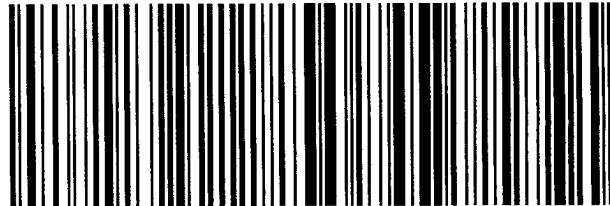
MASTER

80524

CO-US

DEN

XH FTCA

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



ALS Paragon



Radium-226 by EPA Method 903.1(m) Case Narrative

Freeport McMoRan Sierrita


FMI-VRP

Work Order Number: 0812258

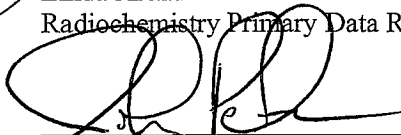
1. This report consists of the analytical results for 15 soil samples received by ALS Paragon on 12/30/08.
2. These samples were prepared and analyzed according to procedures SOP783R8 and SOP336R0. The analyses were completed on 03/17/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. The magnitude of the negative activity for method blank RE090220-7MB is greater than the 2 sigma TPU. The analyst's review of the data does not indicate a problem with the instrument data or the subsequent reporting systems. The data quality is not believed to be affected and the results are submitted without qualification. Under typical conditions, where background level sample data is normally distributed and analyzed by paired observations, this event is likely to occur at least 2.5% of the time.
5. Laboratory control sample RE090220-7LCS has a radiometric recovery below the lower control limit of 57% at 56.5%, as indicated with an "L" qualifier on the final report. Although this recovery suggests a possible low bias in the results of the associated samples, there was a noticeable difference in the transfer of the LCS. The low bias is believed to have affected the LCS only. Results are submitted without further qualification. Please refer to NCR #11244.
6. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Linda Arend
Radiochemistry Primary Data Reviewer

03/27/09
Date


Radiochemistry Final Data Reviewer

03/27/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812258

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
EM-JS-07-5-7	0812258-1		SOIL	13-Aug-08	9:19
EM-JS-06-0-1	0812258-2		SOIL	13-Aug-08	8:40
EM-JS-06-1-3	0812258-3		SOIL	13-Aug-08	8:40
EM-JS-07-1-3	0812258-4		SOIL	13-Aug-08	9:14
EM-JS-06-5-7	0812258-5		SOIL	13-Aug-08	8:45
EM-JS-06-10-11	0812258-6		SOIL	13-Aug-08	8:50
CS-JS-02-10-11	0812258-7		SOIL	04-Aug-08	14:33
RA-JS-02-1-3	0812258-8		SOIL	11-Aug-08	10:45
RA-JS-02-0-1 D	0812258-9		SOIL	11-Aug-08	10:25
RA-SD-02-1.5-3.0 D	0812258-10		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5 D	0812258-11		SOIL	11-Aug-08	9:50
RA-SD-01-1.5-3.0 D	0812258-12		SOIL	11-Aug-08	10:05
EM-JS-07-15-16	0812258-13		SOIL	13-Aug-08	8:45
EM-JS-08-5-7	0812258-14		SOIL	12-Aug-08	1:33
EM-JS-08-10-12	0812258-15		SOIL	12-Aug-08	1:56
C-JS-05-1-3	0812258-16		SOIL	05-Aug-08	11:05
EM-JS-07-10-12	0812258-17		SOIL	13-Aug-08	9:45
RA-SD-02-0-1.5D	0812258-18		SOIL	11-Aug-08	9:10
ST-SB03 80-100	0812258-19		SOIL	02-Oct-08	14:17
ST-SB04 120-140	0812258-20		SOIL	06-Oct-08	9:22
ST-SB03 180-200	0812258-21		SOIL	03-Oct-08	12:27
ST-SB03 60-80	0812258-22		SOIL	02-Oct-08	13:32
ST-SB04 100-120	0812258-23		SOIL	06-Oct-08	8:37
ST-SB03 100-120	0812258-24		SOIL	03-Oct-08	8:57
ST-SB03 20-40	0812258-25		SOIL	02-Oct-08	12:47
ST-SB03 120-140	0812258-26		SOIL	03-Oct-08	9:37
ST-SB03 160-180	0812258-27		SOIL	03-Oct-08	11:42
ST-SB03 40-60	0812258-28		SOIL	02-Oct-08	13:07
ST-SB03 140-160	0812258-29		SOIL	03-Oct-08	10:22
ST-SB01 140-160	0812258-30		SOIL	25-Sep-08	13:17



Project Name/No.: <u>PMI-URP</u> Sampler(s): <u>K. Lutz</u> Turnaround (circle one): <u>Standard</u> or Rush (Due <u>12-22-08</u>) Dispose: <u>60 day</u> or Return to Client																																																																														
Report To: <u>Steven Vaughn</u> Phone: (520) 407-2845 Fax: E-mail: <u>Steven.Vaughn@uscorp.com</u> Company: <u>Freeport McMoran</u> Address: <u>6200 W David Mear Rd.</u> <u>Green Valley, AZ 85614</u>																																																																														
Circle method (right); provide additional information as needed (comments).	<table border="1"> <thead> <tr> <th>Sample ID</th> <th>Date</th> <th>Time *</th> <th>Lab ID</th> <th>Matrix</th> <th>Preservative (Indicate type... HCl, etc.)</th> <th>No. of Containers</th> </tr> </thead> <tbody> <tr> <td>EM-JS-07-5-7</td> <td>8/13/08</td> <td>919</td> <td>①</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>EM-JS-06-0-1</td> <td>8/13/08</td> <td>840</td> <td>②</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>EM-JS-06-1-3</td> <td>8/13/08</td> <td>840</td> <td>③</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>EM-JS-07-1-3</td> <td>8/13/08</td> <td>914</td> <td>④</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>EM-JS-06-5-7</td> <td>8/13/08</td> <td>845</td> <td>⑤</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>EM-JS-06-10-11</td> <td>8/13/08</td> <td>850</td> <td>⑥</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>CS-JS-02-10-11</td> <td>8/14/08</td> <td>1433</td> <td>⑦</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>RA-JS-02-1-3</td> <td>8/11/08</td> <td>1045</td> <td>⑧</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>RA-JS-02-0-1 D</td> <td>8/11/08</td> <td>1025</td> <td>⑨</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> <tr> <td>RA-SD-02-15-30 D</td> <td>8/11/08</td> <td>930</td> <td>⑩</td> <td>S</td> <td>n/a</td> <td>1</td> </tr> </tbody> </table>	Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	EM-JS-07-5-7	8/13/08	919	①	S	n/a	1	EM-JS-06-0-1	8/13/08	840	②	S	n/a	1	EM-JS-06-1-3	8/13/08	840	③	S	n/a	1	EM-JS-07-1-3	8/13/08	914	④	S	n/a	1	EM-JS-06-5-7	8/13/08	845	⑤	S	n/a	1	EM-JS-06-10-11	8/13/08	850	⑥	S	n/a	1	CS-JS-02-10-11	8/14/08	1433	⑦	S	n/a	1	RA-JS-02-1-3	8/11/08	1045	⑧	S	n/a	1	RA-JS-02-0-1 D	8/11/08	1025	⑨	S	n/a	1	RA-SD-02-15-30 D	8/11/08	930	⑩	S	n/a	1
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Relinquished By: Signature: <u>[Signature]</u> Printed Name: <u>Kevin Lutz</u> Date: <u>12-22-08</u> Time: <u>1600</u> Company: <u>ALS</u>							Relinquished By: Signature: <u>[Signature]</u> Printed Name: <u>[Signature]</u> Date: <u>[Date]</u> Time: <u>[Time]</u> Company: <u>[Company]</u>																																																																							
Received By: Signature: <u>Cheryl Trimble</u> Printed Name: <u>Cheryl Trimble</u> Date: <u>12-30-08</u> Time: <u>1025</u> Company: <u>ALS Paragon</u>							Received By: Signature: <u>[Signature]</u> Printed Name: <u>[Signature]</u> Date: <u>[Date]</u> Time: <u>[Time]</u> Company: <u>[Company]</u>																																																																							

Order No. 030807

Index 7962 10037711

Comments:



ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

LAB ID 0812258

Date: 12-22-08 Page 2 of 3

Project Name/No.: FM1-VRP Sampler(s): K. Vaughn Turnaround (circle one): Standard or Rush (Due) Dispose Date 60 day or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: steven.v Vaughn@uscorp.com
Company: Freepart McMoran
Address: 62000 Duval Mine Rd.
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers
RA-SD-01-0-1-5D	8/1/08	950	11	S	n/a	1
RA-SD-01-1-5-3C-D	8/1/08	1005	12	S	n/a	1
EM-JS-07-15-16	8/13/08	915	13	S	n/a	1
EM-JS-08-5-7	8/12/08	0133	14	S	n/a	1
EM-JS-08-10-12	8/12/08	0159	15	S	n/a	1
C-JS-05-1-3	8/15/08	1108	16	S	n/a	1
EM-JS-07-10-12	8/13/08	945	17	S	n/a	1
RA-SD-02-0-1-5D	8/16/08	910	18	S	n/a	1
ST-SB03-20-100	9/2/08	1417	19	S	n/a	1
ST-SB04-120-140	10/6/08	922	20	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No: 0308VT

Fedex 796210837711

VOCs	SW8260B	BTEX (only)	SW8021B	SVOCs	SW8270C	OC Pesticides	SW8081A	PCBs	SW8082	Herbicides	SW8151A	Explosives	SW8330	TCLP Organics SW1311	SW8260B 8270C 8081A 8151A	TCLP Metals SW1311 Hg	SW8010B 7470 7471 E200.7	Total Metals by ICP Hg	SW8010B 7470 E200.7	Total Metals by ICP/MS	SW8020A E200.8	Dissolved Metals by ICP/MS	SW8020A E200.8	Hexavalent Chromium	SW7196A Alkaline Digest? Y / N	Inorganic Anions	SW9056 E300.0 (specify in comments)	Solids:	Total E160.3 TDS E160.1 TSS E160.2	pH	SW9040B SW9045C	TPH	SW8015B GRO DRO (circle one or both)	Gross Alpha / Beta	SW9310 E900.0	Actinides by Paragon SOP	Pu / U / Am / Th / Cm /	Tritium	E906.0	Total Alpha-Emitting Radium	SW9316 E903.0	Radium 226	E903.1	Radium 228	SW9320 E904.0	Strontium 90 (Total RadioSr)	D5811-00	Gamma Isotopes	E901.1	Radon 222	SM7510Rn	Uranium Isotopes 234, 235, 238																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

Relinquished By:	Signature <u>Kevin Vaughn</u>	Printed Name <u>Kevin Vaughn</u>	Date <u>12-22-08</u>	Time <u>1600</u>	Company <u>USC</u>
Relinquished By:	Signature <u>Cheryl Trimble</u>	Printed Name <u>Cheryl Trimble</u>	Date <u>12-30-08</u>	Time <u>1025</u>	Company <u>ALS Paragon</u>



PARAGON ANALYTICALS
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812258

Date: 12-22-08 Page 3 of 3

Project Name/No.: FNI-VRP	Sampler(s): K 442/561	Turnaround (circle one): Standard or Rush (Due)	Disposal: Date 12-22-08 or Return to Client
<p>Report To: Steven Vaughn Phone: (520) 407-2845 Fax: E-mail: Steven.Vaughn@cursecorp.com Company: Freepoint McMoran Address: 6200 cv Duval Mine Rd Green Valley, AZ 85614</p>			
Sample ID	Date	Time *	No. of Containers
ST-SB03 180-200	10/3/08	1227	1
ST-SB03 60-80	10/2/08	1332	1
ST-SB04 100-120	10/6/08	837	1
ST-SB03 100-120	10/3/08	857	1
ST-SB03 20-40	10/2/08	1247	1
ST-SB03 120-140	10/3/08	937	1
ST-SB03 160-180	10/3/08	1142	1
ST-SB03 40-60	10/2/08	1307	1
ST-SB03-140-160	10/3/08	1022	1
ST-SB01-140-160	10/25/08	1317	1
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter			
Comments: Order No. 0548VT Fedex 796210837711			
Circle method (right); provide additional information as needed (comments).			
VOCs	SWB260B		
BTEX (only)	SWB021B		
SVOCs	SWB270C		
OC Pesticides	SWB081A		
PCBs	SWB082		
Herbicides	SWB151A		
Explosives	SWB330		
TCLP Organics SW1311	SWB260B 8270C 8081A 8151A		
TCLP Metals SW1311 Hg	SWB010B 7470		
Total Metals by ICP Hg	SWB010B 7470 7471 E200.7		
Disolved Metals by ICP Hg	SWB010B 7470 E200.7		
Total Metals by ICPMS	SWB020A E200.8		
Disolved Metals by ICPMS	SWB020A E200.8		
Hexavalent Chromium	SW7196A Alkaline Digest? Y / N		
Inorganic Anions	SW9056 E300.0 (specify in comments)		
Solids:	Total E160.3 TDS E160.1 TSS E160.2		
pH	SW9040B SW9045C		
TPH	SWB015B GRO DRO (circle one or both)		
Gross Alpha / Beta	SW9310 E900.0		
Actinides by Paragon SOP	Pu / U / Am / Th / Cm /		
Tritium	E906.0		
Total Alpha-Emitting Radium	SW9315 E903.0		
Radium 226	E903.1		
Radium 228	SW9320 E904.0		
Strontium 90 (Total RadioSr)	D5811-00		
Gamma Isotopes	E901.1		
Radon 222	SM7510Rn		
Uranium Isotopes 234, 235, 238			

(1) Relinquished By:	(2) Relinquished By:
Signature: <u>Kevin Williams</u>	Signature: _____
Printed Name: <u>Kevin Williams</u>	Printed Name: _____
Date: <u>12-22-08</u>	Date: _____
Time: <u>1600</u>	Time: _____
Company: <u>URS</u>	Company: _____

(1) Received By:	(2) Received By:
Signature: <u>Cheryl Trimble</u>	Signature: _____
Printed Name: <u>Cheryl Trimble</u>	Printed Name: _____
Date: <u>12-30-08</u>	Date: _____
Time: <u>1025</u>	Time: _____
Company: <u>ALS Paragon</u>	Company: _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JEWorkorder No: 0812258Initials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	^{cf} <input checked="" type="radio"/> YES ₁₂₋₃₁₋₀₈	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	^{cf} <input checked="" type="radio"/> YES ₁₂₋₃₁₋₀₈	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>11</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.Broken lids: 0812258-1 No visible leakage-13-28All samples have limited volume-29-30If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick SmithDate/Time: Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL511268/26/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

R, 1

Delivery Address Bar Code



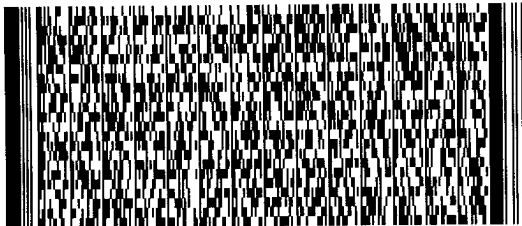
Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

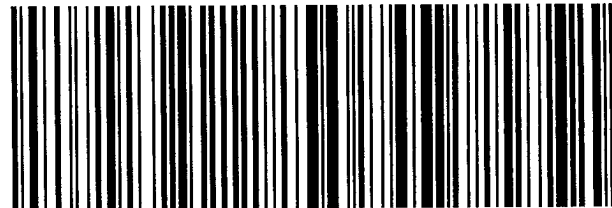


1 of 3
 TRK# 7962 1083 7711
 0201
 ## MASTER ##

TUE - 30DEC AA
 STANDARD OVERNIGHT

XH FTCA

80524
 CO-US
 DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



CONTROLLED NON-CONFORMANCE REPORT

Non-Conformance

Initiated By: Derek B. Caduff on 3/16/2009

Event Type: Lab QC Criteria Not Met -- LCS

Event Explanation: The LCS had a radiometric recovery below the LCL of 57% at 56.5%. Although this recovery suggests a possible low bias in the results of all the samples in the batch, there was a noticeable difference in the transfer of the LCS. The low bias is believed to have affected the LCS only.

Action To

Prevent Recurrence: Potential transfer issue. Currently investigating new transfer techniques.

Corrective Action

Corrective Action: Document in Narrative

Department Manager Approval: Jeff R. Kujawa

Approval Date: 3/19/2009

Corrective Action Comments:

Workorders Affected

Workorder -- Procedure

0812258 -- Ra226_RnE

Rick Smith was contacted on 3/17/2009

Approved By

Julie Ellingson

Approval Date

3/19/2009

Associated Batches

The samples were originally associated with the following Batch(es):

RE090220-7A created on 3/13/2009

All rework was completed in the following Batch(es):

Not Applicable

NCR Approval

Project Manager Approval: JME on 3/19/2009

Department Manager Approval: Jeff R. Kujawa on 3/19/2009

QA Manager Approval: Julie Ellingson on 3/20/2009

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-6MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.053 +/- 0.19	0.35	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812258-1

Date Printed: Friday, March 27, 2009

ALS Paragon
LIMS Version: 6.253A

Page 1 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-7MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-7

QCBatchID: RE090220-7-1

Run ID: RE090220-7A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.17 +/- 0.13	0.33	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812258-1

Date Printed: Friday, March 27, 2009

ALS Paragon
LIMS Version: 6.253A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-6LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Final Aliquot: 1.05 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	41.7 +/- 7.80	0.240	43.1	96.8	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812258-1

Date Printed: Friday, March 27, 2009

ALS Paragon

LIMS Version: 6.253A

Page 1 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-7LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-7

QCBatchID: RE090220-7-1

Run ID: RE090220-7A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	24.3 +/- 4.54	0.250	43.2	56.3	57 - 126	L

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812258-1

Date Printed: Friday, March 27, 2009

ALS Paragon

LIMS Version: 6.253A

Page 2 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Matrix Spike Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-5-7

Lab ID: 0812258-14MS

Sample Matrix: SOIL

Prep SOP: PAI 783

Date Collected: 12-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7

QCBatchID: RE090220-7-1

Run ID: RE090220-7A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Matrix Spike	Sample Results	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	36.7	1.0	0.305	43.5	82.0	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

N - Matrix Spike Recovery outside control limits

P - Matrix Spike Recovery within control limits

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812258-1

Date Printed: Friday, March 27, 2009

ALS Paragon

LIMS Version: 6.253A

Page 1 of 1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-1-3

Lab ID: 0812258-4DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 13-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7

QCBatchID: RE090220-7-1

Run ID: RE090220-7A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.0 +/- 0.59	1.4 +/- 0.48	0.83	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3
Lab ID: 0812258-8DUP

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	1.5 +/- 0.55	1.2 +/- 0.41	0.44	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
DER - Duplicate Error Ratio (see PAI SOP 715)
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-05-1-3

Lab ID: 0812258-16DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7

QCBatchID: RE090220-7-1

Run ID: RE090220-7A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	5.0 +/- 1.1	3.9 +/- 0.88	0.80	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-5-7
Lab ID:	0812258-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.60	0.36	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-1-3
Lab ID:	0812258-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.40	0.28	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-1-3
Lab ID:	0812258-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.59	0.25	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-1-3

Lab ID: 0812258-4DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 13-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7

QCBatchID: RE090220-7-1

Run ID: RE090220-7A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.48	0.27	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Date Printed: Friday, March 27, 2009

ALS Paragon

LIMS Version: 6.253A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-5-7
Lab ID:	0812258-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.54	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-10-11
Lab ID:	0812258-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.38	0.21	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-10-11
Lab ID:	0812258-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.7 +/- 0.93	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-1-3
Lab ID:	0812258-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.55	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3

Lab ID: 0812258-8DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 11-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.41	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Date Printed: Friday, March 27, 2009

ALS Paragon

LIMS Version: 6.253A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	RA-SD-01-0-1.5 D
Lab ID:	0812258-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.46	0.20	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-5-7
Lab ID:	0812258-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.0 +/- 0.41	0.34	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-10-12
Lab ID:	0812258-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.4 +/- 0.86	0.27	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-05-1-3	Sample Matrix: SOIL	Prep Batch: RE090220-7	Final Aliquot: 1.06 g
Lab ID: 0812258-16	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-7-1	Prep Basis: Dry Weight
	Date Collected: 05-Aug-08	Run ID: RE090220-7A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 13-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.0 +/- 1.1	0.34	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-05-1-3
Lab ID:	0812258-16DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7

QCBatchID: RE090220-7-1

Run ID: RE090220-7A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.9 +/- 0.88	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-10-12
Lab ID:	0812258-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.49	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB04 120-140
Lab ID:	0812258-20

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.72	0.52	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB03 20-40	Sample Matrix: SOIL	Prep Batch: RE090220-7	Final Aliquot: 1.02 g
Lab ID: 0812258-25	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-7-1	Prep Basis: Dry Weight
	Date Collected: 02-Oct-08	Run ID: RE090220-7A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 13-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.64	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 140-160
Lab ID:	0812258-30

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.52	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1



ALS Paragon



Radium-228 by Method 9320 Case Narrative

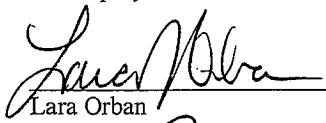
Freeport McMoRan Sierrita

FMI-VRP

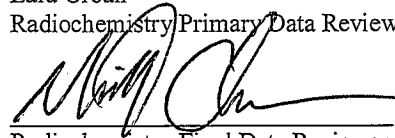
Work Order Number: 0812258

1. This report consists of the analytical results for three soil samples received by ALS Paragon on 12/30/08.
2. These samples were prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in these samples.
3. The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analyses were completed on 01/29/09.
4. The analyses results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. Method 9320 makes no reference to the analysis of soil samples. The soil samples from this work order were initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
6. No further anomalous situations were noted during the preparation and analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer

2/13/09
Date


Radiochemistry Final Data Reviewer

02/16/09
Date

FOR
JOHN
PETROVIC

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812258

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
EM-JS-07-5-7	0812258-1		SOIL	13-Aug-08	9:19
EM-JS-06-0-1	0812258-2		SOIL	13-Aug-08	8:40
EM-JS-06-1-3	0812258-3		SOIL	13-Aug-08	8:40
EM-JS-07-1-3	0812258-4		SOIL	13-Aug-08	9:14
EM-JS-06-5-7	0812258-5		SOIL	13-Aug-08	8:45
EM-JS-06-10-11	0812258-6		SOIL	13-Aug-08	8:50
CS-JS-02-10-11	0812258-7		SOIL	04-Aug-08	14:33
RA-JS-02-1-3	0812258-8		SOIL	11-Aug-08	10:45
RA-JS-02-0-1 D	0812258-9		SOIL	11-Aug-08	10:25
RA-SD-02-1.5-3.0 D	0812258-10		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5 D	0812258-11		SOIL	11-Aug-08	9:50
RA-SD-01-1.5-3.0 D	0812258-12		SOIL	11-Aug-08	10:05
EM-JS-07-15-16	0812258-13		SOIL	13-Aug-08	8:45
EM-JS-08-5-7	0812258-14		SOIL	12-Aug-08	1:33
EM-JS-08-10-12	0812258-15		SOIL	12-Aug-08	1:56
C-JS-05-1-3	0812258-16		SOIL	05-Aug-08	11:05
EM-JS-07-10-12	0812258-17		SOIL	13-Aug-08	9:45
RA-SD-02-0-1.5D	0812258-18		SOIL	11-Aug-08	9:10
ST-SB03 80-100	0812258-19		SOIL	02-Oct-08	14:17
ST-SB04 120-140	0812258-20		SOIL	06-Oct-08	9:22
ST-SB03 180-200	0812258-21		SOIL	03-Oct-08	12:27
ST-SB03 60-80	0812258-22		SOIL	02-Oct-08	13:32
ST-SB04 100-120	0812258-23		SOIL	06-Oct-08	8:37
ST-SB03 100-120	0812258-24		SOIL	03-Oct-08	8:57
ST-SB03 20-40	0812258-25		SOIL	02-Oct-08	12:47
ST-SB03 120-140	0812258-26		SOIL	03-Oct-08	9:37
ST-SB03 160-180	0812258-27		SOIL	03-Oct-08	11:42
ST-SB03 40-60	0812258-28		SOIL	02-Oct-08	13:07
ST-SB03 140-160	0812258-29		SOIL	03-Oct-08	10:22
ST-SB01 140-160	0812258-30		SOIL	25-Sep-08	13:17



PARAGON ANALYTICALS
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812258

Date: 12-22-08 Page 3 of 3

Project Name/No.: FNI-URP Sampler(s): K 442/561 Turnaround (circle one): Standard or Rush (Due) Disposal Date 12-22-08 or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: Steven.Vaughn@cursecorp.com
Company: Freepoint McMoran
Address: 6200 cv Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative	(Indicate type: HCl, etc.)	No. of Containers
ST-SB03 180-200	10/3/08	1227	20	S	n/a		1
ST-SB03 60-70	10/2/08	1332	20	S	n/a		1
ST-SB04 100-120	10/6/08	837	20	S	n/a		1
ST-SB03 100-120	10/3/08	857	20	S	n/a		1
ST-SB03 20-40	10/2/08	1247	20	S	n/a		1
ST-SB03 120-140	10/3/08	937	20	S	n/a		1
ST-SB03 160-180	10/3/08	1142	20	S	n/a		1
ST-SB03 40-60	10/2/08	1307	20	S	n/a		1
ST-SB03-140-160	10/3/08	1022	20	S	n/a		1
ST-SB01-140-160	10/25/08	1317	20	S	n/a		1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter
Comments:

(1) Relinquished By:	(2) Relinquished By:
Signature: <u>Kevin Williams</u>	Signature: _____
Printed Name: <u>Kevin Williams</u>	Printed Name: _____
Date: <u>12-22-08</u>	Date: _____
Time: <u>1600</u>	Time: _____
Company: <u>URS</u>	Company: _____
(1) Received By:	(2) Received By:
Signature: <u>Cheryl Trimble</u>	Signature: _____
Printed Name: <u>Cheryl Trimble</u>	Printed Name: _____
Date: <u>12-30-08</u>	Date: _____
Time: <u>1025</u>	Time: _____
Company: <u>ALS Paragon</u>	Company: _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JEWorkorder No: 0812258Initials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>11</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Broken lids: 0812258-1 No visible leakage
 -13
 -28 All samples have limited volume
 -29
 -30

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL511288/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

R, 1

Delivery Address Bar Code



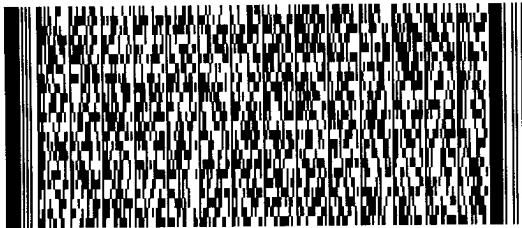
Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

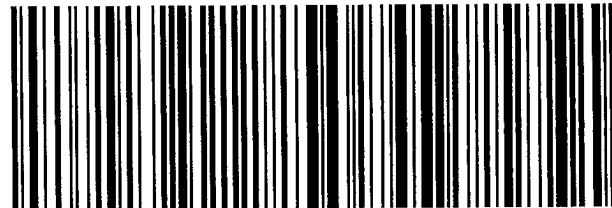


1 of 3
 TRK# 7962 1083 7711
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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812258-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812258-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3

Lab ID: 0812258-8DUP

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 11-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.504 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	8.9 +/- 3.1	8.2 +/- 2.8	0.17	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RA0812258-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-1-3
Lab ID:	0812258-8

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 11-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.502 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	8.9 +/- 3.1	2.7	5	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35840	32500	ug	90.8	40 - 110 %	
YTTRIUM	8713	5310	ug	61.0	40 - 110 %	
Total				55.4	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812258-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3

Lab ID: 0812258-8DUP

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 11-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.504 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	8.2 +/- 2.8	2.4	5	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35750	32200	ug	90.1	40 - 110 %	
YTTRIUM	8713	5570	ug	63.9	40 - 110 %	
Total				57.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812258-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-01-0-1.5 D
Lab ID:	0812258-11

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 11-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.504 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 1.3	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36970	33500	ug	90.7	40 - 110 %	
YTTRIUM	8713	5920	ug	67.9	40 - 110 %	
Total				61.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812258-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-05-1-3
Lab ID:	0812258-16

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 05-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.503 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.6 +/- 2.0	2.7	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36450	33300	ug	91.3	40 - 110 %	
YTTRIUM	8713	5130	ug	58.9	40 - 110 %	
Total				53.7	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812258-1



ALS Paragon



Isotopic Uranium Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**

Work Order Number: 0812258

1. This report consists of the analytical results for 30 soil samples received by ALS Paragon on 12/30/2008.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to potential matrix interference, the samples were prepared at a reduced aliquot of ~1 gram.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 03/16/2009.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. Uranium-234 activity is reported in method blank AS090223-1MB above the minimum detectable concentration value. The measured blank activity is below the requested MDC of 0.1 pCi/g. Results are acceptable according to SOP715R15, and are submitted without further qualification.
7. The duplicate error ratio (DER) for the U-235 analysis of sample 0812258-16 and its duplicate sample 0812258-16DUP was elevated above our warning limit. DER is defined as:

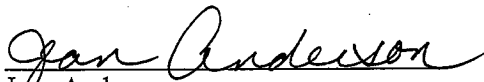
$$DER = \frac{|S - D|}{2 * \sqrt{\sigma_s^2 + \sigma_d^2}}$$



Where: S = sample result, D = duplicate result, σ_s = 1 sigma uncertainty of sample result, and σ_d = sigma uncertainty of the duplicate result. The warning limit for DER is 1.42. This sample's U-235 DER = 1.48. Results are acceptable according to PA SOP715R15.


8. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Jean Anderson

Radiochemistry Primary Data Reviewer

3/20/09
Date


Radiochemistry Final Data Reviewer

03/20/09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812258

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
EM-JS-07-5-7	0812258-1		SOIL	13-Aug-08	9:19
EM-JS-06-0-1	0812258-2		SOIL	13-Aug-08	8:40
EM-JS-06-1-3	0812258-3		SOIL	13-Aug-08	8:40
EM-JS-07-1-3	0812258-4		SOIL	13-Aug-08	9:14
EM-JS-06-5-7	0812258-5		SOIL	13-Aug-08	8:45
EM-JS-06-10-11	0812258-6		SOIL	13-Aug-08	8:50
CS-JS-02-10-11	0812258-7		SOIL	04-Aug-08	14:33
RA-JS-02-1-3	0812258-8		SOIL	11-Aug-08	10:45
RA-JS-02-0-1 D	0812258-9		SOIL	11-Aug-08	10:25
RA-SD-02-1.5-3.0 D	0812258-10		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5 D	0812258-11		SOIL	11-Aug-08	9:50
RA-SD-01-1.5-3.0 D	0812258-12		SOIL	11-Aug-08	10:05
EM-JS-07-15-16	0812258-13		SOIL	13-Aug-08	8:45
EM-JS-08-5-7	0812258-14		SOIL	12-Aug-08	1:33
EM-JS-08-10-12	0812258-15		SOIL	12-Aug-08	1:56
C-JS-05-1-3	0812258-16		SOIL	05-Aug-08	11:05
EM-JS-07-10-12	0812258-17		SOIL	13-Aug-08	9:45
RA-SD-02-0-1.5D	0812258-18		SOIL	11-Aug-08	9:10
ST-SB03 80-100	0812258-19		SOIL	02-Oct-08	14:17
ST-SB04 120-140	0812258-20		SOIL	06-Oct-08	9:22
ST-SB03 180-200	0812258-21		SOIL	03-Oct-08	12:27
ST-SB03 60-80	0812258-22		SOIL	02-Oct-08	13:32
ST-SB04 100-120	0812258-23		SOIL	06-Oct-08	8:37
ST-SB03 100-120	0812258-24		SOIL	03-Oct-08	8:57
ST-SB03 20-40	0812258-25		SOIL	02-Oct-08	12:47
ST-SB03 120-140	0812258-26		SOIL	03-Oct-08	9:37
ST-SB03 160-180	0812258-27		SOIL	03-Oct-08	11:42
ST-SB03 40-60	0812258-28		SOIL	02-Oct-08	13:07
ST-SB03 140-160	0812258-29		SOIL	03-Oct-08	10:22
ST-SB01 140-160	0812258-30		SOIL	25-Sep-08	13:17



Project Name/No.: PMI-URP	Sampler(s): K. Lutz	Turnaround (circle one): Standard or Rush (Due _____)	Dispose: Date 12-22-08 or Return to Client																															
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: E-mail: Steven.Vaughn@uscorp.com Company: Freeport McMoran Address: 6200 W David Mear Rd. Green Valley, AZ 85614																																		
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	VOCs	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics	TCLP Metals	Disolved Metals by ICP Hg	Total Metals by ICP Hg	Disolved Metals by ICPMS	Total Metals by ICPMS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total Radio)	Gamma Isotopes	Radon 222	Manium Isotopes
EM-JS-07-5-7	8/13/08	919	①	S	n/a	1																												
EM-JS-06-0-1	8/13/08	840	②	S	n/a	1																												
EM-JS-06-1-3	8/13/08	840	③	S	n/a	1																												
EM-JS-07-1-3	8/13/08	914	④	S	n/a	1																												
EM-JS-06-5-7	8/13/08	845	⑤	S	n/a	1																												
EM-JS-06-10-11	8/13/08	850	⑥	S	n/a	1																												
CS-JS-02-10-11	8/14/08	1433	⑦	S	n/a	1																												
RA-JS-02-1-3	8/11/08	1045	⑧	S	n/a	1																												
RA-JS-02-0-1 D	8/11/08	1025	⑨	S	n/a	1																												
RA-SD-02-1-5-30 D	8/11/08	930	⑩	S	n/a	1																												

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: **Order No. 030807**

Index 7962 10037711

Reinquisitioned By: (1) Signature: [Signature] Printed Name: Kevin Lutz Date: 12-22-08 Time: 1600 Company: ALS

Reinquisitioned By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____

Received By: (1) Signature: [Signature] Printed Name: Cheryl Trimble Date: 12-30-08 Time: 1025 Company: ALS Paragon

Received By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____



ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812258

Date: 12-22-08 Page 2 of 3

Project Name/No.: FM1-VRP Sampler(s): K. Vaughn Turnaround (circle one): Standard or Rush (Due 12-22-08) Dispose Date 12-22-08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: steven.v Vaughn@uscorp.com

Company: Freepart McMoran

Address: 62000 Duval Mine Rd.

Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
RA-SD-01-0-1-5D	8/1/08	950	11	S	n/a	1
RA-SD-01-1-5-3C-D	8/1/08	1005	12	S	n/a	1
EM-JS-07-15-16	8/13/08	915	13	S	n/a	1
EM-JS-08-5-7	8/12/08	0133	14	S	n/a	1
EM-JS-08-10-12	8/12/08	0159	15	S	n/a	1
C-JS-05-1-3	8/15/08	1108	16	S	n/a	1
EM-JS-07-10-12	8/13/08	945	17	S	n/a	1
RA-SD-02-0-1-5D	8/11/08	910	18	S	n/a	1
ST-SB03-20-100	10/2/08	1417	19	S	n/a	1
ST-SB04-120-140	10/1/08	922	20	S	n/a	1

Comments:

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Relinquished By: Kevin Vaughn

Signature _____

Printed Name Kevin Vaughn

Date 12-22-08 Time 1600

Company URS

Received By: Cheryl Trimble

Signature _____

Printed Name Cheryl Trimble

Date 12-30-08 Time 1025

Company ALS Paragon

Form 202r6.xls (6/16/06)



PARAGON ANALYTICALS
225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS LABORATORY GROUP
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812258

Date: 12-22-08 Page 3 of 3

Project Name/No.: FNI-VZP Sampler(s): K 442/561 Turnaround (circle one): Standard or Rush (Due) Disposal Date 12-22-08 or Return to Client

Report To: Steven Vaughn
Phone: (520) 407-2845
Fax:
E-mail: Steven.Vaughn@cursecorp.com
Company: Freepoint McMoran
Address: 6200 W Duval Mine Rd
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type.... HCl, etc.)	No. of Containers	VOCs		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes	
ST-SB03 180-200	10/3/08	1227	20	S	N/A	1																														
ST-SB03 60-70	10/2/08	1332	20	S	N/A	1																														
ST-SB04 100-120	10/6/08	837	20	S	N/A	1																														
ST-SB03 100-120	10/3/08	857	20	S	N/A	1																														
ST-SB03 20-40	10/2/08	1247	20	S	N/A	1																														
ST-SB03 120-140	10/3/08	937	20	S	N/A	1																														
ST-SB03 160-180	10/3/08	1142	20	S	N/A	1																														
ST-SB03 40-60	10/2/08	1307	20	S	N/A	1																														
ST-SB03- 140-160	10/3/08	1022	20	S	N/A	1																														
ST-SB01- 140-160	10/25/08	1317	20	S	N/A	1																														

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter Relinquished By: (1) Signature: Kevin Williams Printed Name: Kevin Williams Date: 12-22-08 Time: 1600 Company: URS Relinquished By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____

Order No. 0548VT

Feder 796210837711

Received By: (1) Signature: Cheryl Trimble Printed Name: Cheryl Trimble Date: 12-30-08 Time: 1025 Company: ALS Paragon Received By: (2) Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JEWorkorder No: 0812258Initials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	^{cf} <input checked="" type="radio"/> YES ₁₂₋₃₁₋₀₈	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	^{cf} <input checked="" type="radio"/> YES ₁₂₋₃₁₋₀₈	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>11</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Broken lids: 0812258-1 No visible leakage
-13
-28 All samples have limited volume
-29
-30

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL511288/28/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

R, 1

Delivery Address Bar Code



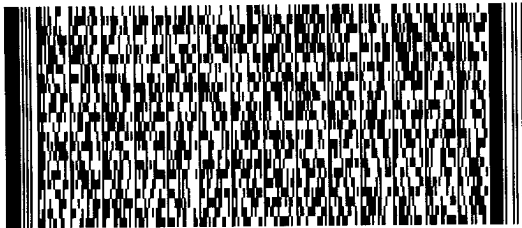
Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

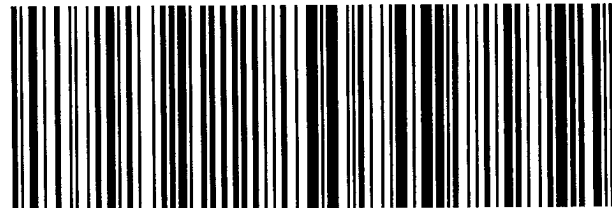


1 of 3
 TRK# 7962 1083 7711
 0201
 ## MASTER ##

TUE - 30DEC AA
 STANDARD OVERNIGHT

XH FTCA

80524
 CO-US
 DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090223-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Feb-09

Date Prepared: 23-Feb-09

Date Analyzed: 07-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 1000 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.0067 +/- 0.0083	0.0052	0.1	B3
15117-96-1	U-235	0.0040 +/- 0.0097	0.0054	0.1	U
7440-61-1	U-238	0.010 +/- 0.0096	0.012	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.331	3.43	pCi/g	79.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812258-1

Date Printed: Friday, March 20, 2009

ALS Paragon
LIMS Version: 6.252A

Page 1 of 2

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090305-3MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Mar-09

Date Prepared: 05-Mar-09

Date Analyzed: 16-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.015 +/- 0.023	0.041	0.1	U
15117-96-1	U-235	-0.0023 +/- 0.027	0.040	0.1	U
7440-61-1	U-238	0.017 +/- 0.023	0.034	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.407	3.26	pCi/g	73.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090223-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Feb-09

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.05 +/- 0.742	0.0533	4.16	97.4	82 - 122	P
7440-61-1	U-238	4.28 +/- 0.779	0.0687	4.32	98.9	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.331	3.63	pCi/g	83.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812258-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090305-3LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Mar-09

Date Prepared: 05-Mar-09

Date Analyzed: 16-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	4.37 +/- 0.797	0.0324	4.28	102	82 - 122	P
7440-61-1	U-238	4.52 +/- 0.822	0.0439	4.45	102	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.407	3.38	pCi/g	76.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812258-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0 D

Lab ID: 0812258-10DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.5 +/- 0.32	1.6 +/- 0.34	0.30	2.13	
15117-96-1	U-235	0.065 +/- 0.048	0.13 +/- 0.068	0.74	2.13	
7440-61-1	U-238	1.8 +/- 0.37	1.8 +/- 0.37	0.12	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812258-1

Date Printed: Friday, March 20, 2009

ALS Paragon

LIMS Version: 6.252A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-05-1-3

Lab ID: 0812258-16DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.2 +/- 0.44	2.6 +/- 0.49	0.54	2.13	
15117-96-1	U-235	0.085 +/- 0.052	0.24 +/- 0.093	1.48	2.13	W
7440-61-1	U-238	2.1 +/- 0.42	1.9 +/- 0.39	0.33	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 140-160

Lab ID: 0812258-30DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 25-Sep-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	1.6 +/- 0.33	1.3 +/- 0.28	0.67	2.13	
15117-96-1	U-235	0.080 +/- 0.054	0.094 +/- 0.055	0.19	2.13	LT
7440-61-1	U-238	1.9 +/- 0.38	1.6 +/- 0.34	0.50	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-5-7
Lab ID:	0812258-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.52	0.038	0.1	
15117-96-1	U-235	0.14 +/- 0.068	0.037	0.1	
7440-61-1	U-238	2.7 +/- 0.51	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.397	3.47	pCi/g	78.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-0-1
Lab ID:	0812258-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.39	0.031	0.1	
15117-96-1	U-235	0.094 +/- 0.054	0.036	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.365	3.48	pCi/g	79.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-1-3
Lab ID:	0812258-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	5.5 +/- 0.96	0.015	0.1	
15117-96-1	U-235	0.23 +/- 0.086	0.018	0.1	
7440-61-1	U-238	5.5 +/- 0.96	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.460	3.83	pCi/g	85.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-1-3
Lab ID:	0812258-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.2 +/- 0.59	0.016	0.1	
15117-96-1	U-235	0.16 +/- 0.073	0.037	0.1	
7440-61-1	U-238	3.7 +/- 0.67	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.386	3.52	pCi/g	80.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-5-7
Lab ID:	0812258-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.47	0.039	0.1	
15117-96-1	U-235	0.086 +/- 0.052	0.019	0.1	LT
7440-61-1	U-238	2.0 +/- 0.41	0.017	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.392	3.29	pCi/g	74.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-10-11
Lab ID:	0812258-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.4 +/- 0.79	0.016	0.1	
15117-96-1	U-235	0.19 +/- 0.079	0.049	0.1	
7440-61-1	U-238	5.0 +/- 0.89	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.456	3.66	pCi/g	82.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-02-10-11	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.02 g
Lab ID: 0812258-7	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 04-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.48	0.015	0.1	
15117-96-1	U-235	0.093 +/- 0.052	0.018	0.1	LT
7440-61-1	U-238	2.7 +/- 0.51	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.374	3.65	pCi/g	83.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-1-3
Lab ID:	0812258-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.8 +/- 0.70	0.048	0.1	
15117-96-1	U-235	0.19 +/- 0.081	0.051	0.1	
7440-61-1	U-238	3.8 +/- 0.70	0.063	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.350	3.38	pCi/g	77.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-0-1 D
Lab ID:	0812258-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.40	0.043	0.1	
15117-96-1	U-235	0.16 +/- 0.078	0.057	0.1	
7440-61-1	U-238	2.0 +/- 0.40	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.18	pCi/g	72.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0 D	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.01 g
Lab ID: 0812258-10	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 11-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.044	0.1	
15117-96-1	U-235	0.065 +/- 0.048	0.049	0.1	LT
7440-61-1	U-238	1.8 +/- 0.37	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.429	3.43	pCi/g	77.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0 D

Lab ID: 0812258-10DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.34	0.046	0.1	
15117-96-1	U-235	0.13 +/- 0.068	0.059	0.1	
7440-61-1	U-238	1.8 +/- 0.37	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.353	3.46	pCi/g	79.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-01-0-1.5 D
Lab ID:	0812258-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.47	0.062	0.1	
15117-96-1	U-235	0.15 +/- 0.070	0.020	0.1	
7440-61-1	U-238	2.6 +/- 0.50	0.033	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.447	3.77	pCi/g	84.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-1.5-3.0 D	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.00 g
Lab ID: 0812258-12	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 11-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.7 +/- 0.85	0.053	0.1	
15117-96-1	U-235	0.13 +/- 0.066	0.039	0.1	
7440-61-1	U-238	4.3 +/- 0.78	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.452	3.65	pCi/g	82.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-15-16
Lab ID:	0812258-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	12 +/- 2.1	0.056	0.1	
15117-96-1	U-235	0.47 +/- 0.15	0.023	0.1	
7440-61-1	U-238	13 +/- 2.2	0.019	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.401	3.12	pCi/g	70.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-5-7
Lab ID:	0812258-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.54	0.069	0.1	
15117-96-1	U-235	0.22 +/- 0.094	0.051	0.1	
7440-61-1	U-238	2.8 +/- 0.54	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.28	pCi/g	74.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-10-12
Lab ID:	0812258-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 12-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	12 +/- 2.1	0.095	0.1	
15117-96-1	U-235	0.57 +/- 0.17	0.068	0.1	
7440-61-1	U-238	12 +/- 2.1	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.464	3.16	pCi/g	70.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-05-1-3
Lab ID:	0812258-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.44	0.055	0.1	
15117-96-1	U-235	0.085 +/- 0.052	0.038	0.1	LT
7440-61-1	U-238	2.1 +/- 0.42	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.411	3.58	pCi/g	81.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-05-1-3

Lab ID: 0812258-16DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.49	0.051	0.1	
15117-96-1	U-235	0.24 +/- 0.093	0.045	0.1	W
7440-61-1	U-238	1.9 +/- 0.39	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.403	3.72	pCi/g	84.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-10-12
Lab ID:	0812258-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.6 +/- 0.68	0.045	0.1	
15117-96-1	U-235	0.12 +/- 0.068	0.052	0.1	
7440-61-1	U-238	3.3 +/- 0.64	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.431	3.23	pCi/g	72.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5D	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.02 g
Lab ID: 0812258-18	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 11-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.24	0.017	0.1	
15117-96-1	U-235	0.024 +/- 0.032	0.056	0.1	U
7440-61-1	U-238	1.0 +/- 0.23	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.398	3.70	pCi/g	84.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 80-100
Lab ID:	0812258-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 02-Oct-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.39	0.050	0.1	
15117-96-1	U-235	0.058 +/- 0.044	0.040	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.345	3.34	pCi/g	76.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 120-140	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.00 g
Lab ID: 0812258-20	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Oct-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.69 +/- 0.17	0.037	0.1	
15117-96-1	U-235	0.065 +/- 0.046	0.044	0.1	LT
7440-61-1	U-238	0.75 +/- 0.18	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.463	3.86	pCi/g	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 180-200
Lab ID:	0812258-21

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 07-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 1000 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.21	0.019	0.1	
15117-96-1	U-235	0.045 +/- 0.022	0.0083	0.1	LT
7440-61-1	U-238	1.3 +/- 0.23	0.0054	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.297	2.98	pCi/g	69.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 60-80
Lab ID:	0812258-22

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 02-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.48	0.074	0.1	
15117-96-1	U-235	0.14 +/- 0.082	0.087	0.1	
7440-61-1	U-238	2.3 +/- 0.48	0.085	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.367	2.53	pCi/g	58.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 100-120
Lab ID:	0812258-23

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.042	0.1	
15117-96-1	U-235	0.26 +/- 0.096	0.043	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.326	3.64	pCi/g	84.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 100-120
Lab ID:	0812258-24

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.49	0.039	0.1	
15117-96-1	U-235	0.20 +/- 0.080	0.034	0.1	
7440-61-1	U-238	2.4 +/- 0.45	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.427	3.87	pCi/g	87.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 20-40
Lab ID:	0812258-25

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 02-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.43	0.058	0.1	
15117-96-1	U-235	0.10 +/- 0.062	0.068	0.1	LT
7440-61-1	U-238	1.9 +/- 0.40	0.072	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.326	3.36	pCi/g	77.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 120-140
Lab ID:	0812258-26

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.42	0.035	0.1	
15117-96-1	U-235	0.14 +/- 0.066	0.035	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.158	3.36	pCi/g	80.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 160-180
Lab ID:	0812258-27

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.33	0.065	0.1	
15117-96-1	U-235	0.22 +/- 0.088	0.049	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.223	3.15	pCi/g	74.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 40-60
Lab ID:	0812258-28

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 02-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.040	0.1	
15117-96-1	U-235	0.078 +/- 0.052	0.047	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.484	3.58	pCi/g	79.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 140-160
Lab ID:	0812258-29

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.33	0.048	0.1	
15117-96-1	U-235	0.082 +/- 0.051	0.048	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.162	3.36	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 140-160
Lab ID:	0812258-30

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 25-Sep-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.33	0.054	0.1	
15117-96-1	U-235	0.080 +/- 0.054	0.064	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.063	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.427	3.54	pCi/g	79.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 140-160

Lab ID: 0812258-30DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 25-Sep-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.28	0.043	0.1	
15117-96-1	U-235	0.094 +/- 0.055	0.044	0.1	LT
7440-61-1	U-238	1.6 +/- 0.34	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.438	3.73	pCi/g	84.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1



ALS Paragon



Gamma Spectroscopy Case Narrative

Freeport McMoRan Sierrita **FMI-VRP**


Work Order Number: 0812258

1. The following report consists of analytical results and supporting documentation for 27 soil samples received by ALS Paragon on 12/30/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812258-2, -9, -10, -12, -13, -18, -19, -21 thru -24, and -26 thru -29 were sealed in steel cans on 01/07/09 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/28/09, respectively, is at least 97.78%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.89%.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 02/17/09.
4. The results for these samples are reported on a "Dry Weight" basis in units of pCi/gram.
5. Sample volume was insufficient to allow preparation of duplicates in batches GS090108-4 and GS090109-8. Duplicate analyses of samples 0812258-2, -30, and -29 were performed in lieu of prepared duplicates.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples. This is applicable for samples 0812258-2, -9, -10, -12, -13, -18, -19, -21 thru -24, and -26 thru -29.




7. The library used for calibration and analysis employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular equilibrium. This is applicable for samples 0812258-2, -9, -10, -12, -13, -18, -19, -21 thru -24, and -26 thru -29.
8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "TI" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. The requested detection limit of 1.0 pCi/gram for ^{228}Ra was not met for many of the samples associated with this work order. The reported activities are greater than the achieved detection limits. The results have been flagged with a "M3" qualifier on the final reports. The results are submitted without further qualification.
11. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS Paragon certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Lara Orban
Radiochemistry Primary Data Reviewer

02/19/09
Date


Radiochemistry Final Data Reviewer

2-19-09
Date

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812258

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
EM-JS-07-5-7	0812258-1		SOIL	13-Aug-08	9:19
EM-JS-06-0-1	0812258-2		SOIL	13-Aug-08	8:40
EM-JS-06-1-3	0812258-3		SOIL	13-Aug-08	8:40
EM-JS-07-1-3	0812258-4		SOIL	13-Aug-08	9:14
EM-JS-06-5-7	0812258-5		SOIL	13-Aug-08	8:45
EM-JS-06-10-11	0812258-6		SOIL	13-Aug-08	8:50
CS-JS-02-10-11	0812258-7		SOIL	04-Aug-08	14:33
RA-JS-02-1-3	0812258-8		SOIL	11-Aug-08	10:45
RA-JS-02-0-1 D	0812258-9		SOIL	11-Aug-08	10:25
RA-SD-02-1.5-3.0 D	0812258-10		SOIL	11-Aug-08	9:30
RA-SD-01-0-1.5 D	0812258-11		SOIL	11-Aug-08	9:50
RA-SD-01-1.5-3.0 D	0812258-12		SOIL	11-Aug-08	10:05
EM-JS-07-15-16	0812258-13		SOIL	13-Aug-08	8:45
EM-JS-08-5-7	0812258-14		SOIL	12-Aug-08	1:33
EM-JS-08-10-12	0812258-15		SOIL	12-Aug-08	1:56
C-JS-05-1-3	0812258-16		SOIL	05-Aug-08	11:05
EM-JS-07-10-12	0812258-17		SOIL	13-Aug-08	9:45
RA-SD-02-0-1.5D	0812258-18		SOIL	11-Aug-08	9:10
ST-SB03 80-100	0812258-19		SOIL	02-Oct-08	14:17
ST-SB04 120-140	0812258-20		SOIL	06-Oct-08	9:22
ST-SB03 180-200	0812258-21		SOIL	03-Oct-08	12:27
ST-SB03 60-80	0812258-22		SOIL	02-Oct-08	13:32
ST-SB04 100-120	0812258-23		SOIL	06-Oct-08	8:37
ST-SB03 100-120	0812258-24		SOIL	03-Oct-08	8:57
ST-SB03 20-40	0812258-25		SOIL	02-Oct-08	12:47
ST-SB03 120-140	0812258-26		SOIL	03-Oct-08	9:37
ST-SB03 160-180	0812258-27		SOIL	03-Oct-08	11:42
ST-SB03 40-60	0812258-28		SOIL	02-Oct-08	13:07
ST-SB03 140-160	0812258-29		SOIL	03-Oct-08	10:22
ST-SB01 140-160	0812258-30		SOIL	25-Sep-08	13:17



Project Name/No.: **PMI-URP** Sampler(s): **K. Lutz** Turnaround (circle one): **Standard** or **Rush** (Due **12-22-08**) Dispose: **60 day** or **Return to Client**

Report To: **Steven Vaughn**
Phone: (520) 407-2845
Fax:
E-mail: **Steven.Vaughn@uscorp.com**
Company: **Freeport McMoran**
Address: **6200 W David Mear Rd.**
Green Valley, AZ 85614

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	VOCS	BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics	TCLP Metals	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICPMS	Dissolved Metals by ICPMS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total Radio)	Gamma Isotopes	Radon 222	Manium Isotopes
EM-JS-07-5-7	8/13/08	919	①	S	n/a	1																												
EM-JS-06-0-1	8/13/08	840	②	S	n/a	1																												
EM-JS-06-1-3	8/13/08	840	③	S	n/a	1																												
EM-JS-07-1-3	8/13/08	914	④	S	n/a	1																												
EM-JS-06-5-7	8/13/08	845	⑤	S	n/a	1																												
EM-JS-06-10-11	8/13/08	850	⑥	S	n/a	1																												
CS-JS-02-10-11	8/14/08	1433	⑦	S	n/a	1																												
RA-JS-02-1-3	8/11/08	1045	⑧	S	n/a	1																												
RA-JS-02-0-1 D	8/11/08	1025	⑨	S	n/a	1																												
RA-SD-02-15-30 D	8/11/08	930	⑩	S	n/a	1																												

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments: **Order No. 030807**

Relinquished By:
Signature: **K. Lutz**
Printed Name: **Kevin Lutz**
Date: **12-22-08** Time: **1600**
Company: **ALS**

Relinquished By:
Signature: **Cheryl Trimble**
Printed Name: **Cheryl Trimble**
Date: **12-30-08** Time: **1025**
Company: **ALS Paragon**

Form 2026.xls (6/16/06)

Form 202r6.xls (6/16/06)

Project Name/No.:	Sample(s):	Turnaround (circle one):	Standard	Rush (Due)	Dispose:	Date to City	or Return to Client
Report To: Steven Vaughn Phone: (520) 407-2895 Fax: E-mail: Steven.Vaughn@cursecorp.com Company: Freeport McMoran Address: 6200 W Duval Mine Rd Green Valley, AZ 85614							
Circle method (right); provide additional information as needed (comments).							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type... HCl, etc.)	No. of Containers	
ST-SB03 180-200	10/3/08	1227	20	S	N/A	1	
ST-SB03 60-70	10/2/08	1332	20	S	N/A	1	
ST-SB04 100-120	10/6/08	837	20	S	N/A	1	
ST-SB03 100-120	10/3/08	857	20	S	N/A	1	
ST-SB03 20-40	10/2/08	1247	20	S	N/A	1	
ST-SB03 120-140	10/3/08	0937	20	S	N/A	1	
ST-SB03 160-180	10/3/08	1142	20	S	N/A	1	
ST-SB03 40-60	10/2/08	1307	20	S	N/A	1	
ST-SB03 140-160	10/3/08	1022	20	S	N/A	1	
ST-SB01-140-160	9/25/08	1317	30	S	N/A	1	
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments:							
Order No. 050808VT							
Fede x 796210837711							

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: Freeport
Project Manager: JEWorkorder No: 0812258Initials: CDT Date: 12-30-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	^{cf} <input checked="" type="radio"/> YES ₁₂₋₃₁₋₀₈	<input checked="" type="radio"/> NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	^{cf} <input checked="" type="radio"/> YES ₁₂₋₃₁₋₀₈	<input checked="" type="radio"/> NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>12</u>	
	Background µR/hr reading: <u>11</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Broken lids: 0812258-1 No visible leakage
 -13
 -28 All samples have limited volume
 -29
 -30

If applicable, was the client contacted? ☒ YES / NO / NA Contact: Rick Smith Date/Time: Project Manager Signature / Date: JE

*IR Gun #2: Oakton, SN 29922500201-0066

*IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCL511268/26/23

Ship Date: 29DEC08
 ActWgt: 16.7 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

R, 1

Delivery Address Bar Code



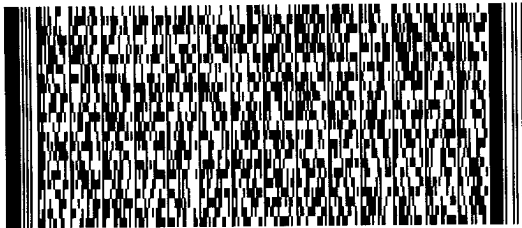
Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

SHIP TO: (907) 443-1511

BILL SENDER

Receiving-Julie Ellingson
 ALS Paragon Analytics
 225 Commerce Drive

Ft. Collins, CO 80524

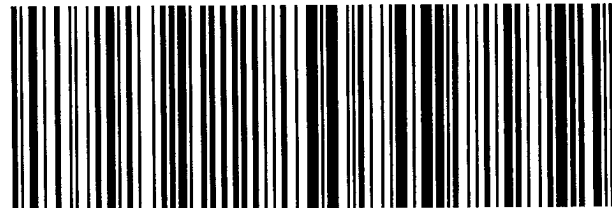


1 of 3
 TRK# 7962 1083 7711
 0201
 ## MASTER ##

TUE - 30DEC AA
 STANDARD OVERNIGHT

XH FTCA

80524
 CO-US
 DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090108-4MB

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 45 minutes

Final Aliquot: 77.9 g

Result Units: pCi/g

File Name: 090164d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.075 +/- 0.30	0.57	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-8MB

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Final Aliquot: 165 g

Result Units: pCi/g

File Name: 090144d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.22 +/- 0.19	0.29	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-8MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Final Aliquot: 165 g

Result Units: pCi/g

File Name: 090144d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.28 +/- 0.32	0.48	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090108-4LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090123d09

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1120 +/- 131	3.01	986	114	85 - 115	P
10198-40-0	Co-60	476 +/- 55.9	1.76	456	105	85 - 115	P
10045-97-3	Cs-137	387 +/- 45.5	2.19	374	104	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-8ALCS

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090184d09

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	453 +/- 53.1	2.59	470	96.4	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-8LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Jan-09

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090185d09

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	502 +/- 58.9	2.42	462	109	85 - 115	P
10198-40-0	Co-60	216 +/- 25.4	0.851	213	102	85 - 115	P
10045-97-3	Cs-137	179 +/- 21.1	1.20	175	102	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-0-1
Lab ID: 0812258-2DUP

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 13-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8
QCBatchID: GS090109-8-1
Run ID: GS090109-8A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 191 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090138d04A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.9 +/- 0.49	2.9 +/- 0.47	0.05	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 140-160

Lab ID: 0812258-29DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090143d04A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.5 +/- 0.47	2.5 +/- 0.46	0.02	2.13	G

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-0-1
Lab ID: 0812258-2DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 13-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8
QCBatchID: GS090109-8-1
Run ID: GS090109-8A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 191 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090138d04

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.1 +/- 0.63	1.4 +/- 0.64	0.75	2.13	TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 140-160

Lab ID: 0812258-29DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090143d04

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.1 +/- 0.78	1.0 +/- 0.48	0.09	2.13	G, TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 140-160

Lab ID: 0812258-30DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 73.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d04

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.7 +/- 0.79	1.2 +/- 0.46	0.59	2.13	G, TI

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-5-7

Lab ID: 0812258-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 72.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090116d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.78	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-0-1

Lab ID: 0812258-2

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 191 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090172d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.49	0.53	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-0-1

Lab ID: 0812258-2DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 191 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090138d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.47	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-0-1

Lab ID: 0812258-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 191 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090172d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.63	0.86	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-0-1

Lab ID: 0812258-2DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 191 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090138d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.64	0.99	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-1-3

Lab ID: 0812258-3

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090082d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.49	0.80	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-1-3

Lab ID: 0812258-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090159d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.62	0.99	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-5-7

Lab ID: 0812258-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 85.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090083d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	0.93	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-10-11

Lab ID: 0812258-6

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 66.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090118d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.6 +/- 1.2	1.4	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-02-10-11

Lab ID: 0812258-7

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090160d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.64	0.94	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-0-1 D
Lab ID:	0812258-9

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 130 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090173d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.2 +/- 0.59	0.67	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-0-1 D
Lab ID:	0812258-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 130 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090173d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.80	1.3	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0 D

Lab ID: 0812258-10

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 156 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090174d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.45	0.56	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0 D

Lab ID: 0812258-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 156 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090174d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.68	1.3	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-1.5-3.0 D

Lab ID: 0812258-12

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 139 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090177d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.9 +/- 0.67	0.71	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-1.5-3.0 D

Lab ID: 0812258-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 139 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090177d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.8 +/- 1.0	1.3	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-15-16

Lab ID: 0812258-13

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090178d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.0 +/- 0.77	0.61	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-15-16

Lab ID: 0812258-13

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090178d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.2 +/- 0.93	1.1	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-5-7

Lab ID: 0812258-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 70.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090084d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.76	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-10-12

Lab ID: 0812258-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090119d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.75	0.96	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-10-12

Lab ID: 0812258-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 89.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090161d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.66	0.99	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-0-1.5D
Lab ID:	0812258-18

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 169 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090137d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.42	0.48	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5D

Lab ID: 0812258-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 169 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090137d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.50	0.67	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 80-100
Lab ID:	0812258-19

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 180 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090179d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.42	0.46	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 80-100
Lab ID:	0812258-19

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 180 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090179d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.64	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 120-140

Lab ID: 0812258-20

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090085d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.56	1.0	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 180-200

Lab ID: 0812258-21

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 189 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090139d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.28	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 180-200

Lab ID: 0812258-21

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 189 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090139d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.57	0.87	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 60-80

Lab ID: 0812258-22

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090180d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.44	0.56	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 60-80

Lab ID: 0812258-22

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090180d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.58	1.2	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 100-120
Lab ID:	0812258-23

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090140d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.2 +/- 0.52	0.44	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 100-120

Lab ID: 0812258-23

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090140d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.78	0.95	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 100-120
Lab ID:	0812258-24

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 155 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090181d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.2 +/- 0.55	0.63	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 100-120

Lab ID: 0812258-24

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 155 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090181d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.92	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 20-40
Lab ID:	0812258-25

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 17-Feb-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4B

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 65.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090296d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.62	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 120-140

Lab ID: 0812258-26

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 176 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090141d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.44	0.49	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 120-140

Lab ID: 0812258-26

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 176 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090141d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.49	0.75	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 160-180

Lab ID: 0812258-27

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 168 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090182d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.45	0.44	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 160-180

Lab ID: 0812258-27

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 168 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090182d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.73	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 40-60
Lab ID:	0812258-28

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 161 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090142d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.44	0.53	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 40-60
Lab ID:	0812258-28

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 161 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090142d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.51	0.86	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 140-160
Lab ID:	0812258-29

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090183d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.47	0.50	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 140-160

Lab ID: 0812258-29DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090143d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.46	0.52	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 140-160

Lab ID: 0812258-29

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090183d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.78	1.1	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 140-160

Lab ID: 0812258-29DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090143d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.0 +/- 0.48	0.79	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 140-160

Lab ID: 0812258-30

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 73.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090162d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.79	1.2	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 140-160

Lab ID: 0812258-30DUP

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 73.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.46	0.79	1	G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-175

Sampling Event: July 11th and 14th, 2008Sample-specific Parameter Review? **Yes**

Data Reviewer: Katie Abbott

Peer Reviewer: Sheri Fling

Laboratory Performance Parameters? **No**

Date Completed: August 8, 2012

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for twenty soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
CP-JS-03-0-1	SA	0812175-1	Soil	X	---	X	X ¹
CP-JS-03-1-3	SA	0812175-2	Soil	X	---	X	X ¹
CP-JS-03-5-7	SA	0812175-3	Soil	X	---	X	X ¹
CP-M04-5-5.4	SA	0812175-4	Soil	---	---	X	X ²
E-JS-02-0-1	SA	0812175-5	Soil	X	---	X	X ¹
E-JS-02-1-3	SA	0812175-6	Soil	X	---	X	X ¹
E-JS-01-0-1	SA	0812175-7	Soil	X ^m	---	X	X ¹
E-JS-01-1-3	SA	0812175-8	Soil	X	X	X	---
E-JS-01-5-7	SA	0812175-9	Soil	X	---	X	X ¹
EV-JS-01-0-1	SA	0812175-10	Soil	X	---	X	X ¹
EV-JS-01-1-3	SA	0812175-11	Soil	X	X	X	---
CP-M04-1-2.5	SA	0812175-12	Soil	---	---	X	X ²
CP-O03-0-1	SA	0812175-13	Soil	---	---	X	X ²
CP-O03-1-3	SA	0812175-14	Soil	---	---	X	X ²
CP-M06-0-1	SA	0812175-15	Soil	---	---	X	X ²
CP-M06-1-3	SA	0812175-16	Soil	---	---	X	X ²
CP-JS-02-0-1	SA	0812175-17	Soil	X	---	X	X ¹
CP-N08-0-1	SA	0812175-18	Soil	---	---	X	X ²
CP-N08-1-3	SA	0812175-19	Soil	X	---	X	X ¹
CP-N08-5-7	SA	0812175-20	Soil	X	---	X	X ¹

Sample Type: SA = Sample
 GFPC – Gas Flow Proportional Counting
 X¹ - Radium-228
 X² - Radium-226 and Radium-228
 X^m - Matrix spike

General Overall Assessment:

_____ Data are usable without qualification.
 _____ **X** Data are usable with qualification (noted below).
 _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	<p>Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP).</p> <p>It was noted on the sample receipt form that the sample identification (ID) was listed on the container labels and the container lids. Sample CP-N08-1-3 had the lid for sample CP-N08-5-7 and sample CP-N08-5-7 had the lid for sample CP-N08-1-3. The samples were logged per the IDs listed on the container labels.</p>
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks. Data qualification was not required.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) E-JS-01-0-1 (Radium-226) Laboratory Duplicate (LD) CP-JS-03-1-3 (Gamma Spectroscopy) CP-JS-03-5-7 (Isotopic Uranium) CP-M04-1-2.5 (Isotopic Uranium) E-JS-01-0-1 (Radium-226) 	No	<p>With the exception listed in Table 1 below, the recoveries for the MS analysis were within the laboratory-determined acceptance range.</p> <p>The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event.</p> <p>When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only.</p> <p>The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. The duplicate error ratio (DER) met the QC criterion of ≤ 1.</p>
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	<p>Implied Detection Limits</p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p>Sample Specific Chemical Recoveries</p> <p>The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required.</p> <p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.</p>
Field Quality Control <ul style="list-style-type: none"> Equipment Blank None Field Duplicate None 	No	<p>Equipment Blank</p> <p>An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed.</p> <p>Field Duplicate (FD)</p> <p>A field duplicate was not reported in this data package. The frequency of field</p>

Review Parameter	Criteria Met?	Comments
		duplicates did not meet the QAPP required 1 per 20 samples submitted.
MDCs Met?	No	For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary. All samples for isotopic uranium were prepared at a reduced aliquot; however, all MDC's were met. No further action is necessary.
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples CP-JS-03-1-3, CP-M04-5-5.4, CP-M04-1-2.5, CP-M06-1-3, CP-JS-02-0-1, CP-N08-1-3, and CP-N08-5-7 did not meet these requirements and were flagged by the laboratory as TI and were qualified as T4 (tentatively identified) during data validation. In some cases the sample density was less than or greater than the associated calibration standard density. The density of samples CP-JS-03-5-7, E-JS-01-5-7, EV-JS-01-0-1, CP-M06-0-1, and CP-JS-02-0-1 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

 \leq - Less than or equal to \pm - Plus or Minus

DER – Duplicate Error Ratio

LCS/LCSD – Laboratory Control Sample/Laboratory Control Sample Duplicate

MS – Matrix Spike

N1 – See Case Narrative

QAPP – Quality Assurance Project Plan

RPD – Relative Percent Difference

TPU – Total Propagated Uncertainty

% - Percent

COC – Chain of Custody

ID – Identification

LD – Laboratory Duplicate

MDC – Minimum Detectable Concentration

N/A – Not Applicable

QC – Quality Control

T4 – Tentatively Identified Compound

Table 1: Matrix Spike Outliers and Resultant Data Qualification

Radium-226 (Method 903.1)			
Sample	Analyte	MS %R (Limits)	Data Qualification
E-JS-01-0-1	Radium-226	171 (57-126)	As the potential bias was considered to be high, the radium-226 result for sample E-JS-01-0-1 was flagged as (M1).

%R – Percent Recovery

MS – Matrix Spike

M1 – Matrix spike recovery was high; the associated blank spike recovery was acceptable.

Bold indicates a recovery outside of acceptance limits.

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-02-1.5-30
Lab ID:	0812176-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 111 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090027d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.56	0.79	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

KA 8/8/12

Date Printed: Monday, February 02, 2009

ALS Paragon

LIMS Version: 6.241A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-04-0-1.5
Lab ID:	0812176-2

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 28-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2
QCBatchID: GS090106-2-1
Run ID: GS090106-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 112 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090063d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.63	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

KA 8/8/12

Date Printed: Monday, February 02, 2009

ALS Paragon
LIMS Version: 6.241A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-04-1.5-3.0
Lab ID:	0812176-3

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 28-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2
QCBatchID: GS090106-2-1
Run ID: GS090106-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 104 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090070d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.56	0.81	1	TI <i>ty</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide Identification and/or quantitation is tentative.
TI - Nuclide Identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

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PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-03-0-1.5
Lab ID:	0812176-4

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 28-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2
QCBatchID: GS090106-2-1
Run ID: GS090106-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 114 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090060d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15282-20-1	Ra-228	3.0 +/- 0.65	0.88	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-03-1.5-3.0
Lab ID: 0812176-5

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 28-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2
QCBatchID: GS090109-2-1
Run ID: GS090109-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 196 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090072d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.42	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-03-1.5-3.0
Lab ID:	0812176-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 196 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090072d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.59	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-SD-07-1.5-3.0
Lab ID:	0812176-6

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 23-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2
QCBatchID: GS090109-2-1
Run ID: GS090109-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 212 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090069d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.38	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-07-1.5-3.0
Lab ID: 0812176-6

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 23-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2
QCBatchID: GS090109-2-1
Run ID: GS090109-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Allquot: 212 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090069d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.60	0.83	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P12-0-1
Lab ID: 0812176-7

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 23-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2
QCBatchID: GS090106-2-1
Run ID: GS090106-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 89.2 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090085d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.82	1.1	1	M3, TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-05-0-1.5	Sample Matrix: SOIL	Prep Batch: GS090106-2	Final Aliquot: 90.6 g
Lab ID: 0812176-8	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-2-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 29-Jul-08	Run ID: GS090106-2A	Moisture(%): NA
	Date Prepared: 24-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 13-Jan-09	Report Basis: Dry Weight	File Name: 090028d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.9 +/- 0.72	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative
R - Nuclide has exceeded 8 half-lives
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 708)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-01-0-1.5
Lab ID: 0812176-9

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 28-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2
QCBatchID: GS090106-2-1
Run ID: GS090106-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 114 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090064d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.68	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-01-1.5-3.0

Lab ID: 0812176-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 106 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090071d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.57	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative

R - Nuclide has exceeded 8 half-lives

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
Client/Project ID: FMI-VRP

Field ID: OD-SD-06-0-1.5
Lab ID: 0812176-11

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 29-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2
QCBatchID: GS090106-2-1
Run ID: GS090106-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 76.2 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090061d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.2 +/- 0.77	0.96	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoran Sierrita
Client Project ID: FMI-VRP

Field ID:	OD-SD-06-1.5-3.0
Lab ID:	0812176-12

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 29-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2
QCBatchID: GS090109-2-1
Run ID: GS090109-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 203 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090080d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.45	0.54	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-06-1.5-3.0
Lab ID: 0812176-12

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 29-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2
QCBatchID: GS090109-2-1
Run ID: GS090109-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 203 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090080d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.57	0.88	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-01-0-1	Sample Matrix: SOIL	Prep Batch: GS090106-3	Final Allquot: 92.3 g
Lab ID: 0812176-13	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 29-Jul-08	Run ID: GS090106-3A	Moisture(%): NA
	Date Prepared: 31-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 12-Jan-09	Report Basis: Dry Weight	File Name: 090076d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.66	0.99	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield Is In control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide Identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-02-0-1	Sample Matrix: SOIL	Prep Batch: GS090106-3	Final Allquot: 103 g
Lab ID: 0812176-14	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 29-Jul-08	Run ID: GS090106-3A	Moisture(%): NA
	Date Prepared: 31-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 12-Jan-09	Report Basis: Dry Weight	File Name: 090015d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.46	0.67	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

Client/Project ID: FMI-VRP

Field ID:	OD-JS-02-1-3
Lab ID:	0812176-15

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 108 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090052d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.69	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-C22-0-1
Lab ID: 0812176-18

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 29-Jul-08
Date Prepared: 31-Dec-08
Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3
QCBatchID: GS090106-3-1
Run ID: GS090106-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 103 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090077d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.52	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-E24-0-1
Lab ID: 0812176-17

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 29-Jul-08
Date Prepared: 31-Dec-08
Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3
QCBatchID: GS090106-3-1
Run ID: GS090106-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 93.6 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090053d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.60	1.2	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide Identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812176-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-E24-1-3
Lab ID: 0812176-18

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 29-Jul-08
Date Prepared: 31-Dec-08
Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3
QCBatchID: GS090106-3-1
Run ID: GS090106-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 98.6 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090078d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.56	1.0	1	M3, TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density

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Isotopic Uranium By Alpha Spectroscopy

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-02-1.5-30	Sample Matrix: SOIL	Prep Batch: AS090127-5	Final Aliquot: 1.02 g
Lab ID: 0812176-1	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090127-5-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: AS090127-6A	Moisture(%): NA
	Date Prepared: 27-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.050	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.037	0.1	BH
7440-61-1	U-238	1.8 +/- 0.36	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.450	3.79	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-04-0-1.5
Lab ID: 0812176-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.49	0.050	0.1	
15117-96-1	U-235	0.18 +/- 0.079	0.047	0.1	84
7440-61-1	U-238	2.6 +/- 0.49	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.511	3.64	pCi/g	80.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-04-1.5-3.0

Lab ID: 0812176-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.34	0.054	0.1	
15117-96-1	U-235	0.10 +/- 0.059	0.047	0.1	84
7440-61-1	U-238	1.6 +/- 0.34	0.066	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.488	3.30	pCi/g	73.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-03-0-1.5

Lab ID: 0812176-4

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 0.504 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.7 +/- 0.72	0.11	0.1	M3
15117-96-1	U-235	0.31 +/- 0.14	0.097	0.1	M3
7440-61-1	U-238	4.0 +/- 0.77	0.12	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.962	8.15	pCi/g	91.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-03-1.5-3.0

Lab ID: 0812176-5

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.5 +/- 0.80	0.038	0.1	NA
15117-96-1	U-235	0.23 +/- 0.089	0.044	0.1	NA , B4
7440-61-1	U-238	4.8 +/- 0.85	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.463	3.71	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

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Isotopic Uranium By Alpha Spectroscopy

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-07-1.5-3.0
Lab ID: 0812176-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.034	0.1	
15117-96-1	U-235	0.12 +/- 0.067	0.055	0.1	BY
7440-61-1	U-238	2.2 +/- 0.44	0.051	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	3.50	pCi/g	78.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P12-0-1
Lab ID:	0812176-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.511 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.39	0.083	0.1	
15117-96-1	U-235	0.19 +/- 0.11	0.037	0.1	BH
7440-81-1	U-238	1.7 +/- 0.39	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.844	7.20	pCi/g	81.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

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Isotopic Uranium By Alpha Spectroscopy

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-05-0-1.5
Lab ID: 0812176-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.9 +/- 0.70	0.054	0.1	
15117-96-1	U-235	0.18 +/- 0.079	0.060	0.1	84
7440-61-1	U-238	3.7 +/- 0.67	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.519	3.69	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

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Isotopic Uranium By Alpha Spectroscopy

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-01-0-1.5

Lab ID: 0812176-9

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.029	0.1	
15117-96-1	U-235	0.099 +/- 0.055	0.047	0.1	LT 84
7440-61-1	U-238	2.2 +/- 0.42	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.440	3.79	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

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Date Printed: Tuesday, February 03, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-01-1.5-3.0

Lab ID: 0812176-10

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.039	0.1	
15117-96-1	U-235	0.091 +/- 0.051	0.018	0.1	LT BH
7440-61-1	U-238	1.9 +/- 0.38	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.425	3.73	pCi/g	84.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

Date Printed: Tuesday, February 03, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
Client/Project ID: FMI-VRP

Field ID: OD-SD-06-0-1.5
Lab ID: 0812176-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.50	0.039	0.1	
15117-96-1	U-235	0.18 +/- 0.075	0.034	0.1	54
7440-61-1	U-238	3.1 +/- 0.56	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	3.88	pCi/g	86.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

ICA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-06-1.5-3.0

Lab ID: 0812176-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.4 +/- 0.79	0.016	0.1	
15117-96-1	U-235	0.23 +/- 0.088	0.044	0.1	BH
7440-61-1	U-238	4.5 +/- 0.80	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.61	pCi/g	80.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

KA 8/8/12

Date Printed: Tuesday, February 03, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-01-0-1
Lab ID: 0812176-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.52	0.033	0.1	
15117-96-1	U-235	0.11 +/- 0.057	0.039	0.1	BL
7440-61-1	U-238	2.9 +/- 0.52	0.014	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.96	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

KA 8/8/12

Date Printed: Tuesday, February 03, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-02-0-1
Lab ID: 0812176-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.015	0.1	
15117-96-1	U-235	0.052 +/- 0.038	0.018	0.1	LT B4
7440-61-1	U-238	2.1 +/- 0.40	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.516	3.95	pCi/g	87.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

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Date Printed: Tuesday, February 03, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-02-1-3	Sample Matrix: SOIL	Prep Batch: AS090127-5	Final Aliquot: 1.01 g
Lab ID: 0812176-15	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090127-5-1	Prep Basis: Dry Weight
	Date Collected: 29-Jul-08	Run ID: AS090127-5A	Moisture(%): NA
	Date Prepared: 27-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 30-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.47	0.036	0.1	
15117-96-1	U-235	0.079 +/- 0.049	0.036	0.1	LT 84
7440-61-1	U-238	2.4 +/- 0.46	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.73	pCi/g	83.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

Date Printed: Tuesday, February 03, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-C22-0-1
Lab ID: 0812176-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.045	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.043	0.1	BDL
7440-61-1	U-238	1.9 +/- 0.37	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.484	3.81	pCi/g	84.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

KA 8/8/12

Date Printed: Tuesday, February 03, 2009

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LIMS Version: 6.242A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-E24-0-1

Lab ID: 0812176-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jul-08

Date Prepared: 27-Jan-09

Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5

QCBatchID: AS090127-5-1

Run ID: AS090127-5A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.053	0.1	
15117-96-1	U-235	0.086 +/- 0.052	0.044	0.1	LT 84
7440-61-1	U-238	1.7 +/- 0.35	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.490	3.88	pCi/g	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812176-1

KA 8/8/12

Date Printed: Tuesday, February 03, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-E24-1-3
Lab ID:	0812176-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 29-Jul-08
Date Prepared: 27-Jan-09
Date Analyzed: 30-Jan-09

Prep Batch: AS090127-5
QCBatchID: AS090127-5-1
Run ID: AS090127-5A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.41	0.057	0.1	
15117-96-1	U-235	0.11 +/- 0.074	0.056	0.1	84
7440-61-1	U-238	1.8 +/- 0.41	0.065	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.496	2.52	pCi/g	56.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812176-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812176

Client Name: Freeport McMoRan Sierita

ClientProject ID: FMI-VRP

Field ID:	OD-SD-02-1.5-30
Lab ID:	0812176-1

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 28-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090203-3

QC Batch ID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.83	0.69	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812176-1

KA 8/8/12

Date Printed: Friday, March 06, 2009

ALS Paragon

LIMS Version: 6.249A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-04-0-1.5
Lab ID: 0812176-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.66	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

KA 8/8/12

Date Printed: Friday, March 06, 2009

ALS Paragon
LIMS Version: 6.249A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-04-1.5-3.0
Lab ID: 0812176-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-83-3	Ra-226	2.6 +/- 0.63	0.22	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

KA 8/8/12

Date Printed: Friday, March 06, 2009

ALS Paragon
LIMS Version: 6.249A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-03-0-1.5
Lab ID: 0812176-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.70	0.25	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

CA 8/8/12

Date Printed: Friday, March 06, 2009

ALS Paragon
LIMS Version: 8.249A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P12-0-1
Lab ID: 0812176-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.43	0.055	1	

Comments:

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M - The requested MDC was not met.

Abbreviations:

- TPU - Total Propagated Uncertainty (see PAI SOP 743)
- MDC - Minimum Detectable Concentration (see PAI SOP 709)
- BDL - Below Detection Limit

Data Package ID: RE0812176-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-05-0-1.5
Lab ID: 0812176-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.68	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	OD-SD-01-0-1.5
Lab ID:	0812176-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.59	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
Client Project ID: FMI-VRP

Field ID: OD-SD-01-1.5-3.0
Lab ID: 0812176-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.50	0.31	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoran Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-08-0-1.5
Lab ID: 0812176-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.64 +/- 0.29	0.18	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-01-0-1
Lab ID: 0812176-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.1 +/- 0.91	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-02-0-1
Lab ID: 0812176-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.5 +/- 1.1	0.79	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-02-1-3
Lab ID: 0812176-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.3 +/- 0.79	0.22	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-C22-0-1
Lab ID: 0812176-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.61	0.20	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-E24-0-1
Lab ID: 0812176-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.54 +/- 0.25	0.20	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812176
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-E24-1-3
Lab ID:	0812176-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.68	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812176-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-05-0-1
Lab ID:	0812212-1

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 212 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090121d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.37	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-05-0-1

Lab ID: 0812212-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 212 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090121d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.64	0.69	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

IM3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-05-1-3D	Sample Matrix: SOIL	Prep Batch: GS090106-6	Final Aliquot: 115 g
Lab ID: 0812212-2	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-6-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 27-Aug-08	Run ID: GS090106-6A	Moisture(%): NA
	Date Prepared: 31-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 21-Jan-09	Report Basis: Dry Weight	File Name: 090153d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.61	0.91	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-06-0-1

Lab ID: 0812212-3

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 216 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090106d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.33	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-08-0-1
Lab ID:	0812212-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QC Batch ID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 216 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090106d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.44	0.65	1	T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-02-0-1
Lab ID: 0812212-4

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 85.5 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090105d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.7 +/- 0.96	1.5	1	M3, TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

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Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-01-0-1
Lab ID: 0812212-5

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 175 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090132d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.48	0.55	1	G N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide Identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-01-0-1
Lab ID: 0812212-5

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 175 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090132d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.60	1.2	1	M3,G N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide Identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-01-1-3
Lab ID: 0812212-6

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 87.0 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090109d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.8 +/- 0.84	1.2	1	M3, TI 74

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-M26-0-1

Lab ID: 0812212-7

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090111d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.83	1.1	1	M3,G,TI T4 , NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-M26-1-3
Lab ID: 0812212-8

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 74.8 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090077d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.56	0.96	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-M26-5-7

Lab ID: 0812212-9

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 01-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 156 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090075d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.49	0.58	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide Identification and/or quantitation is tentative

TI - Nuclide Identification is tentative

R - Nuclide has exceeded 8 half-lives

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-M26-5-7
Lab ID: 0812212-9

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 156 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090075d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.9 +/- 0.79	1.0	1	M3,G,TI T4,NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is In control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation

SI - Nuclide Identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-01-0-1
Lab ID: 0812212-10

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 74.9 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090112d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.77	1.1	1	M3,G,TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-01-1-3
Lab ID: 0812212-11

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 84.1 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090078d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.69	1.1	1	M3,G,TI 74, N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-02-1-3
Lab ID: 0812212-12

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 172 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090164d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.41	0.42	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-02-1-3
Lab ID: 0812212-12

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 172 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090164d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.56	0.94	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation

SI - Nuclide Identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	C-JS-02-5-7
Lab ID:	0812212-13

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 01-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 70.5 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090113d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	5.2 +/- 1.2	1.3	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-H22-0-1
Lab ID: 0812212-14

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 30-Jul-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 177 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090157d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.38	0.53	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative
R - Nuclide has exceeded 8 half-lives
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812212-1

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PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-H22-0-1
Lab ID: 0812212-14

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 30-Jul-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 177 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090157d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.60	0.90	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density

Data Package ID: GSS0812212-1

KA 8/10/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-H22-1-3
Lab ID: 0812212-15

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 30-Jul-08
Date Prepared: 31-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 86.2 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090079d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.0 +/- 0.63	0.82	1	TI 74

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

KA-8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-0-1

Lab ID: 0812212-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QC Batch ID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090114d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.80	1.2	1	M3,G,TI +4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812212-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoran Sierrita
Client Project ID: FMI-VRP

Field ID: CJS-03-1-3
Lab ID: 0812212-17

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 04-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3
QCBatchID: GS090106-3-1
Run ID: GS090106-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 78.2 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090024d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.69	1.1	1	M3,G,TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812212-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-05-0-1
Lab ID:	0812212-1

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.3 +/- 0.62	0.042	0.1	
15117-96-1	U-235	0.19 +/- 0.080	0.044	0.1	
7440-61-1	U-238	3.3 +/- 0.62	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.468	3.85	pCi/g	86.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is In control at 100-110%. Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

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Date Printed: Saturday, March 07, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-05-1-3D

Lab ID: 0812212-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	6.6 +/- 1.2	0.032	0.1	NA
15117-96-1	U-235	0.34 +/- 0.11	0.020	0.1	NA
7440-61-1	U-238	6.6 +/- 1.2	0.044	0.1	NA

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.488	3.85	pCi/g	85.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 12/4/12
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Date Printed: Saturday, March 07, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-08-0-1
Lab ID:	0812212-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 27-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.046	0.1	
15117-96-1	U-235	0.096 +/- 0.054	0.019	0.1	LT
7440-61-1	U-238	1.6 +/- 0.33	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.181	3.38	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met

Abbreviations

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Date Printed: Saturday, March 07, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-02-0-1
Lab ID:	0812212-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.10 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.043	0.1	
15117-96-1	U-235	0.13 +/- 0.062	0.034	0.1	
7440-61-1	U-238	2.5 +/- 0.47	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.113	3.55	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812212-1

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Date Printed: Saturday, March 07, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-01-0-1
Lab ID:	0812212-5

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.079	0.1	
15117-96-1	U-235	0.079 +/- 0.050	0.047	0.1	LT
7440-61-1	U-238	1.7 +/- 0.35	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	3.82	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

VA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-01-1-3
Lab ID:	0812212-6

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.55	0.053	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.042	0.1	
7440-61-1	U-238	2.9 +/- 0.54	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.421	3.89	pCi/g	88.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-M26-0-1
Lab ID:	0812212-7

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.054	0.1	
15117-96-1	U-235	0.11 +/- 0.064	0.058	0.1	
7440-61-1	U-238	1.7 +/- 0.36	0.054	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.29	pCi/g	73.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-M26-1-3
Lab ID:	0812212-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.46	0.045	0.1	
15117-96-1	U-235	0.13 +/- 0.063	0.036	0.1	
7440-61-1	U-238	2.5 +/- 0.48	0.045	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.372	3.46	pCi/g	79.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Date Printed: Saturday, March 07, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
Client Project ID: FMI-VRP

Field ID:	EM-M26-5-7
Lab ID:	0812212-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.51	0.029	0.1	
15117-96-1	U-235	0.25 +/- 0.090	0.034	0.1	
7440-61-1	U-238	2.9 +/- 0.54	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.496	3.88	pCi/g	86.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812212-1

ICA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-01-0-1
Lab ID:	0812212-10

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.032	0.1	
15117-96-1	U-235	0.092 +/- 0.053	0.019	0.1	LT
7440-61-1	U-238	1.5 +/- 0.31	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.467	3.59	pCi/g	80.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-01-1-3

Lab ID: 0812212-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.030	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.018	0.1	
7440-61-1	U-238	1.7 +/- 0.34	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.463	3.58	pCi/g	80.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Date Printed: Saturday, March 07, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-02-1-3
Lab ID:	0812212-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 01-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.49	0.036	0.1	
15117-96-1	U-235	0.088 +/- 0.051	0.018	0.1	LT
7440-61-1	U-238	2.6 +/- 0.50	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.324	3.46	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is In control at 100-110%. Quantitative Yield Is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-02-5-7
Lab ID: 0812212-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.3 +/- 0.62	0.029	0.1	
15117-96-1	U-235	0.20 +/- 0.082	0.047	0.1	
7440-61-1	U-238	4.0 +/- 0.72	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.186	3.31	pCi/g	79.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-H22-0-1
Lab ID:	0812212-14

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 30-Jul-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.045	0.1	
15117-96-1	U-235	0.096 +/- 0.056	0.049	0.1	LT
7440-61-1	U-238	1.9 +/- 0.39	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.309	3.43	pCi/g	79.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-H22-1-3
Lab ID:	0812212-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 30-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.062	0.1	
15117-96-1	U-235	0.055 +/- 0.044	0.055	0.1	U
7440-61-1	U-238	1.3 +/- 0.28	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.494	3.70	pCi/g	82.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812212-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-0-1
Lab ID:	0812212-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.045	0.1	
15117-96-1	U-235	0.12 +/- 0.059	0.018	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.423	3.86	pCi/g	87.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812212

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-1-3
Lab ID:	0812212-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.046	0.1	
15117-96-1	U-235	0.14 +/- 0.066	0.041	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.269	3.78	pCi/g	88.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812212-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CS-JS-05-1-3D
Lab ID:	0812212-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 27-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.6 +/- 1.2	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

ICA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-JS-02-0-1
Lab ID:	0812212-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.74	0.31	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-01-1-3
Lab ID: 0812212-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.50	0.32	1	NG

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-M26-0-1
Lab ID:	0812212-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.68	0.43	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-M26-1-3
Lab ID: 0812212-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.50	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-01-0-1
Lab ID: 0812212-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.53	0.48	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

KA 8/0/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-01-1-3
Lab ID: 0812212-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.62	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	C-JS-02-5-7
Lab ID:	0812212-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.0 +/- 0.98	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	EM-H22-1-3
Lab ID:	0812212-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 30-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.55	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

1CA-8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-03-0-1
Lab ID: 0812212-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.61	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield Is In control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812212
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-03-1-3
Lab ID: 0812212-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.91 +/- 0.35	0.073	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812212-1

KA 8/10/12

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-255

Sampling Event: September 17th-19th, 24th, 26th, October 21st-24th, 28th, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **No**

Data Reviewer: Katie Abbott

Date Completed: August 14, 2012

Peer Reviewer: Sheri Fling

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for twenty-four soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
ST-SB06 20-40	SA	0812255-1	Soil	X	---	X	X ¹
ST-SB06 300-320	FD	0812255-2	Soil	X	---	X	X ¹
ET-SB01 20-40	SA	0812255-3	Soil	X	---	X	X ¹
ET-SB01 40-60	SA	0812255-4	Soil	X	---	X	X ¹
ST-SB06 220-240	SA	0812255-5	Soil	X	---	X	X ¹
ST-SB01 40-60	SA	0812255-6	Soil	X	---	X	X ¹
ST-SB01 0-20	SA	0812255-7	Soil	X	---	X	X ¹
ST-SB06 100-120	SA	0812255-8	Soil	X	---	X	X ¹
ST-SB06 160-180	SA	0812255-9	Soil	X	---	X	X ¹
ST-SB01 220-235.5	SA	0812255-10	Soil	X	---	X	X ¹
ST-SB01 237-255.5	SA	0812255-11	Soil	X	---	X	X ¹
ET-SB01 0-20	SA	0812255-12	Soil	X	---	X	X ¹
ST-SB06 280-300	SA	0812255-13	Soil	---	---	X	X ²
ST-SB06 260-280	SA	0812255-14	Soil	---	---	X	X ²
ST-SB06 60-80	SA	0812255-15	Soil	X ^m	---	X	X ¹
ET-SB02 0-20	SA	0812255-16	Soil	X	---	X	X ¹
ET-SB02 50-60	SA	0812255-17	Soil	X	X	X	---
ET-SB01 80-100	SA	0812255-18	Soil	X	---	X	X ¹
ST-SB06 80-100	SA	0812255-19	Soil	X	X	X	---
ST-SB06 120-140	SA	0812255-20	Soil	X	---	X	X ¹
ST-SB01 200-220	SA	0812255-21	Soil	X	---	X	X ¹
ET-SB01 60-80	SA	0812255-22	Soil	X	---	X	X ¹
ET-SB02 40-50	SA	0812255-23	Soil	X	---	X	X ¹
ST-SB06 300-320D	FD	0812255-24	Soil	X	---	X	X ¹

Sample Type: SA = Sample FD = Field Duplicate

GFPC – Gas Flow Proportional Counting

X¹ - Radium-228

X² - Radium-226 and Radium-228

X^m - Matrix spike

General Overall Assessment:

_____	Data are usable without qualification.
<u> X </u>	Data are usable with qualification (noted below).
_____	Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
<i>Sample-specific Parameters</i>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	<p>Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP).</p> <p>It was noted on the sample receipt form that the container label for sample ET-SB01 20-40 listed the identification (ID) as ET-SB01 20-40. The laboratory was able to correctly ID the sample by matching the collection time and date to the ID on the chain of custody (COC). In addition, it was noted on the sample receipt form that the container lids for samples ST-SB06 280-300 and ET-SB01 80-100 were received broken. They were replaced at the laboratory upon arrival. No further action was necessary.</p> <p>Per clarification from the client, sample ET-SB01 20-40 was correctly re-identified as sample ET-SB01 20-40. The data sheets and the upfront table have been updated to reflect the correct sample IDs.</p>
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	No	With the exceptions listed in Table 1 below, target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) ST-SB06 60-80 (Ra-226) Laboratory Duplicate (LD) ST-SB06 260-280 (Gamma Spectroscopy) ST-SB06 20-4 (Gamma Spectroscopy) ST-SB01 237-255.5 (Gamma Spectroscopy, Ra-226) ST-SB06-220-240 (Isotopic Uranium) ST-SB06 60-80 (Isotopic Uranium) ST-SB01 40-60 (Ra-226) 	No	<p>The recoveries for the MS analysis were within the laboratory-determined acceptance range.</p> <p>The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event.</p> <p>When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only.</p> <p>The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. With the exceptions summarized below in Table 2, the duplicate error ratio (DER) met the QC criterion.</p>
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate 	Yes	<p>Implied Detection Limits</p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p>Sample Specific Chemical Recoveries</p> <p>The sample specific recoveries were within the laboratory-determined</p>

Review Parameter	Criteria Met?	Comments
(LCS/LCSD)		acceptance limits for the applicable methods. Data qualification was not required. Laboratory Control Sample/ Laboratory Control Sample Duplicate The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.
Field Quality Control • Equipment Blank None • Field Duplicate ST-SB06 300-320/ ST-SB06 300-320D	No	Equipment Blank An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed. Field Duplicate (FD) The agreement between parent sample results and the field duplicate sample results was evaluated. The DER met the QC criterion of ≤ 2 .
MDCs Met?	No	For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary. All samples for isotopic uranium were prepared at a reduced aliquot; however, all MDC's were met. No further action is necessary.
Other Parameters • Tentatively Identified Compounds (TICs) • Case Narrative	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples ET-SB01 20-40, ET-SB01 40-60, ST-SB06 220-240, ST-SB01 40-60, ST-SB01 0-20, ST-SB06 100-120, ST-SB06 160-180, ST-SB01 220-235.5, ST-SB01 237-255.5, ET-SB01 0-20, ST-SB06 280-300, ST-SB06 260-280, ET-SB02 0-20, ET-SB01 80-100, ST-SB06 120-140, ET-SB01 60-80, ET-SB02 40-50, and ST-SB06 300-320D did not meet these requirements and were flagged TI (tentatively identified) by the laboratory and qualified as T4 during data validation. In some cases the sample density is less than or greater than the associated calibration standard density. The density of samples ST-SB06 20-40, ST-SB06 300-320, ET-SB01 20-40, ET-SB01 40-60, ST-SB01 40-60, ST-SB01 0-20, ST-SB06 100-120, ST-SB06 160-180, ST-SB01 220-235.5, ST-SB01 237-255.5, ET-SB01 0-20, ST-SB06 280-300, ST-SB06 120-140, ST-SB01 200-220, ET-SB02 40-50, and ST-SB06 300-320D exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

 \leq - Less than or equal to \pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS/MSD - Matrix Spike/ Matrix Spike Duplicate

N1 - See Case Narrative

QC - Quality Control

T4 - Tentatively Identified Compound

VOCs - Volatile Organic Compounds

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

Table 1: Method Blank Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	Concentration (pCi/g)	Data Qualification
MB Batch AS090223-1	Uranium-234	0.0067 ± 0.0083	None. All associated uranium-234 results were reported at concentrations >10x the blank contamination.

pCi/g – Picocuries per gram

B4 = Target analyte detected in the blank outside of the method acceptance criteria.

Table 2: DER Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	DER	Data Qualification
ST-SB06 60-80	Uranium-234	1.1	The DERs between the parent sample and laboratory duplicate sample for the listed analytes exceeded the criterion of ≤ 1.0 . Therefore, the associated analytical results were qualified as estimated N6.

DER – Duplicate Error Ratio

N6 – Data suspect due to quality control failure, data reported per data user's result.

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 20-40
Lab ID: 0812255-1

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 21-Oct-08
Date Prepared: 07-Jan-09
Date Analyzed: 22-Jan-09

Prep Batch: GS090108-3
QCBatchID: GS090108-3-1
Run ID: GS090108-3A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 73.7 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090098d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.82 +/- 0.60	0.88	1	U,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Date Printed: Tuesday, February 17, 2009

ALS Paragon
LIMS Version: 8.245A

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 300-320	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 78.4 g
Lab ID: 0812255-2	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 28-Oct-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 60 minutes	Result Units: pCi/g
	Date Analyzed: 22-Jan-09	Report Basis: Dry Weight	File Name: 090136d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.87 +/- 0.39	0.82	1	LT,G N

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: 07-0501-20-46 ET-5601-20-46	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 78.3 g
Lab ID: 0812255-3	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 18-Sep-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090138d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.75	1.1	1	M3,G,TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 40-60	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 75.2 g
Lab ID: 0812255-4	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 18-Sep-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090124d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.75	1.4	1	M3,G,TI NI,14

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB08 220-240	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 87.1 g
Lab ID: 0812255-5	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 24-Oct-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090139d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.81	0.90	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide Identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

KT 8/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 40-60	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 75.3 g
Lab ID: 0812255-6	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 24-Sep-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090177d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.69	0.79	1	G, TI NI, TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 0-20
Lab ID: 0812255-7

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 24-Sep-08
Date Prepared: 07-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3
QCBatchID: GS090108-3-1
Run ID: GS090108-3A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 73.6 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090126d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.86	1.2	1	M3,G,TI NI,TV

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 100-120 Lab ID: 0812255-8 Library: Ra-228	Sample Matrix: SOIL Prep SOP: PAI 739 Rev 9 Date Collected: 23-Oct-08 Date Prepared: 07-Jan-09 Date Analyzed: 23-Jan-09	Prep Batch: GS090108-3 QCBatchID: GS090108-3-1 Run ID: GS090108-3A Count Time: 30 minutes Report Basis: Dry Weight	Final Aliquot: 73.9 g Prep Basis: Dry Weight Moisture(%): NA Result Units: pCi/g File Name: 090140d09
--	--	---	--

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.84	1.1	1	M3,G,TI N1,T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

KA 8/14/12

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 160-180	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 82.3 g
Lab ID: 0812255-9	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 23-Oct-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 45 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090179d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.0 +/- 0.47	0.78	1	G, TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 220-235.5	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 72.5 g
Lab ID: 0812255-10	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 26-Sep-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 45 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090142d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.75	1.0	1	M3,G,TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide Identification and/or quantitation is tentative

TI - Nuclide Identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 237-255.5	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 81.8 g
Lab ID: 0812255-11	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 26-Sep-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090143d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.65	0.89	1	G, TI NI. 74

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 0-20
Lab ID: 0812255-12

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 17-Sep-08
Date Prepared: 07-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3
QCBatchID: GS090108-3-1
Run ID: GS090108-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 74.1 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090144d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.72	1.2	1	M3,G,TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 280-300

Lab ID: 0812255-13

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 181 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.37	0.41	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 280-300	Sample Matrix: SOIL	Prep Batch: GS090109-7	Final Aliquot: 181 g
Lab ID: 0812255-13	Prep SOP: PAI 739 Rev 9	QC Batch ID: GS090109-7-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 28-Oct-08	Run ID: GS090109-7A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 28-Jan-09	Report Basis: Dry Weight	File Name: 090131d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.70	0.86	1	G, TI N1, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met

SQ - Spectral quality prevents accurate quantitation

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative

R - Nuclide has exceeded 8 half-lives

G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 280-280
Lab ID: 0812255-14

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 28-Oct-08
Date Prepared: 07-Jan-09
Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7
QCBatchID: GS090109-7-1
Run ID: GS090109-7A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 192 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090170d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.39	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
Client/Project ID: FMI-VRP

Field ID: ST-SB06 260-280
Lab ID: 0812255-14

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 28-Oct-08
Date Prepared: 07-Jan-09
Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7
QCBatchID: GS090109-7-1
Run ID: GS090109-7A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 192 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090170d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.53	0.93	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
Client/Project ID: FMI-VRP

Field ID: ST-S808 60-80
Lab ID: 0812255-15

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 22-Oct-08
Date Prepared: 07-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3
QCBatchID: GS090108-3-1
Run ID: GS090108-3A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 97.0 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090146d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.82	0.98	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 0-20

Lab ID: 0812255-16

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 89.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.84	1.1	1	M3,TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB01 80-100

Lab ID: 0812255-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 18-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090149d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.57	1.1	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 120-140	Sample Matrix: SOIL	Prep Batch: GS090108-3	Final Aliquot: 75.0 g
Lab ID: 0812255-20	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 23-Oct-08	Run ID: GS090108-3A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 45 minutes	Result Units: pCi/g
	Date Analyzed: 26-Jan-09	Report Basis: Dry Weight	File Name: 090185d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.56	0.89	1	G,TI NA, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812255-1

KA 8/14/12

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 200-220

Lab ID: 0812255-21

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 26-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 60 minutes

Report Basis: Dry Weight

Final Aliquot: 74.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090136d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.46	0.86	1	G NA

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 60-80 Lab ID: 0812255-22 Library: Ra-228	Sample Matrix: SOIL Prep SOP: PAI 739 Rev 9 Date Collected: 18-Sep-08 Date Prepared: 07-Jan-09 Date Analyzed: 26-Jan-09	Prep Batch: GS090108-3 QCBatchID: GS090108-3-1 Run ID: GS090108-3A Count Time: 30 minutes Report Basis: Dry Weight	Final Aliquot: 101 g Prep Basis: Dry Weight Moisture(%): NA Result Units: pCi/g File Name: 090150d09
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CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.53	0.75	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 40-50

Lab ID: 0812255-23

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090186d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.68	1.1	1	M3,G,TI NI,TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 300-320D

Lab ID: 0812255-24

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 26-Jan-09

Prep Batch: GS090108-3

QCBatchID: GS090108-3-1

Run ID: GS090108-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090187d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.66	1.0	1	M3,G,TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 20-40

Lab ID: 0812255-1

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 21-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.035	0.1	
15117-96-1	U-235	0.060 +/- 0.041	0.025	0.1	LT
7440-61-1	U-238	1.7 +/- 0.34	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.410	3.83	pCi/g	86.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 300-320

Lab ID: 0812255-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.75 +/- 0.19	0.034	0.1	
15117-96-1	U-235	0.053 +/- 0.041	0.020	0.1	LT
7440-61-1	U-238	0.91 +/- 0.22	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.411	3.12	pCi/g	70.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-5804-20-40 Lab ID: 0812255-3	Sample Matrix: SOIL Prep SOP: PAI 778 Rev 12 Date Collected: 18-Sep-08 Date Prepared: 25-Feb-09 Date Analyzed: 06-Mar-09	Prep Batch: AS090225-3 QCBatchID: AS090225-3-1 Run ID: AS090225-3A Count Time: 300 minutes Report Basis: Dry Weight	Final Aliquot: 1.02 g Prep Basis: Dry Weight Moisture(%): NA Result Units: pCi/g File Name: Spectrum #1
--	--	---	---

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.015	0.1	
15117-96-1	U-235	0.12 +/- 0.060	0.034	0.1	
7440-61-1	U-238	2.2 +/- 0.43	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.428	3.81	pCi/g	86.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 40-60
Lab ID: 0812255-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 18-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: AS090225-3
QC Batch ID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 360 minutes
Report Basis: Dry Weight

Final Allquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.42	0.073	0.1	
15117-96-1	U-235	0.13 +/- 0.083	0.079	0.1	
7440-61-1	U-238	2.4 +/- 0.52	0.098	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.449	2.01	pCi/g	45.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is In control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 220-240

Lab ID: 0812255-5

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.056	0.1	
15117-96-1	U-235	0.071 +/- 0.050	0.062	0.1	LT
7440-61-1	U-238	1.6 +/- 0.32	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.445	3.57	pCi/g	80.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB01 40-60
Lab ID:	0812255-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.043	0.1	
15117-98-1	U-235	0.099 +/- 0.055	0.047	0.1	LT
7440-61-1	U-238	1.9 +/- 0.37	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.396	3.96	pCi/g	90.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 0-20

Lab ID: 0812255-7

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Sep-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.45	0.050	0.1	
15117-96-1	U-235	0.17 +/- 0.074	0.051	0.1	
7440-61-1	U-238	2.2 +/- 0.42	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.339	3.83	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	ST-SB06 100-120
Lab ID:	0812255-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.045	0.1	
15117-98-1	U-235	0.12 +/- 0.062	0.049	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.420	3.98	pCi/g	90.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 160-180

Lab ID: 0812255-9

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 11-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 360 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.43	0.065	0.1	
15117-96-1	U-235	0.10 +/- 0.077	0.087	0.1	
7440-61-1	U-238	1.6 +/- 0.37	0.065	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.384	1.78	pCi/g	40.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

KA 8/14/12

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ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 220-235.5
Lab ID: 0812255-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 26-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.39	0.069	0.1	
15117-96-1	U-235	0.10 +/- 0.067	0.051	0.1	
7440-61-1	U-238	1.9 +/- 0.41	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.393	2.71	pCi/g	61.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 237-255.5

Lab ID: 0812255-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 26-Sep-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.99 +/- 0.22	0.055	0.1	
15117-96-1	U-235	0.036 +/- 0.038	0.062	0.1	U
7440-61-1	U-238	1.0 +/- 0.23	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.466	3.92	pCi/g	87.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 0-20
Lab ID: 0812255-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.37	0.090	0.1	
15117-96-1	U-235	0.085 +/- 0.055	0.054	0.1	LT
7440-61-1	U-238	1.8 +/- 0.37	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.455	3.29	pCi/g	73.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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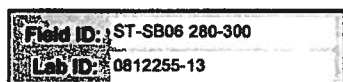
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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP



Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13866-29-5	U-234	1.2 +/- 0.25	0.065	0.1	
15117-96-1	U-235	0.077 +/- 0.048	0.035	0.1	LT
7440-61-1	U-238	1.4 +/- 0.29	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.482	3.99	pCi/g	89.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 708)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 260-280
Lab ID: 0812255-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.054	0.1	
15117-96-1	U-235	0.092 +/- 0.053	0.035	0.1	LT
7440-61-1	U-238	1.8 +/- 0.35	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.423	3.91	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 60-80

Lab ID: 0812255-15

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 22-Oct-08

Date Prepared: 25-Feb-09

Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3

QCBatchID: AS090225-3-1

Run ID: AS090225-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.10 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.53	0.038	0.1	NG
15117-98-1	U-235	0.13 +/- 0.061	0.039	0.1	NG 100% yield
7440-61-1	U-238	2.6 +/- 0.49	0.044	0.1	NG

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.111	3.69	pCi/g	89.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 0-20
Lab ID:	0812255-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 19-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.15 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.061	0.1	
15117-96-1	U-235	0.10 +/- 0.062	0.059	0.1	
7440-61-1	U-238	2.1 +/- 0.43	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	3.933	2.72	pCi/g	69.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 50-60
Lab ID: 0812255-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 19-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.26	0.045	0.1	
15117-96-1	U-235	0.16 +/- 0.074	0.039	0.1	
7440-61-1	U-238	1.0 +/- 0.23	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.220	3.21	pCi/g	76.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 80-100
Lab ID: 0812255-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 18-Sep-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.80 +/- 0.18	0.014	0.1	
15117-96-1	U-235	0.029 +/- 0.028	0.032	0.1	U
7440-61-1	U-238	0.87 +/- 0.20	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.462	4.03	pCi/g	90.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Date Printed: Friday, March 20, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
Client Project ID: FMI-VRP

Field ID: ST-SB08 80-100	Sample Matrix: SOIL	Prep Batch: AS090225-3	Final Aliquot: 1.03 g
Lab ID: 0812255-19	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090225-3-1	Prep Basis: Dry Weight
	Date Collected: 23-Oct-08	Run ID: AS090225-3A	Moisture(%): NA
	Date Prepared: 25-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 06-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.36	0.039	0.1	
15117-96-1	U-235	0.12 +/- 0.064	0.038	0.1	
7440-61-1	U-238	1.7 +/- 0.35	0.017	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.37	pCi/g	76.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is In control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Date Printed: Friday, March 20, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 120-140
Lab ID: 0812255-20

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Oct-08
Date Prepared: 25-Feb-09
Date Analyzed: 06-Mar-09

Prep Batch: AS090225-3
QCBatchID: AS090225-3-1
Run ID: AS090225-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.028	0.1	
15117-96-1	U-235	0.094 +/- 0.051	0.017	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.489	3.88	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 200-220

Lab ID: 0812255-21

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 26-Sep-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.043	0.1	
15117-96-1	U-235	0.065 +/- 0.047	0.051	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.457	3.75	pCi/g	84.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 60-80
Lab ID: 0812255-22

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 18-Sep-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.84 +/- 0.22	0.075	0.1	
15117-96-1	U-235	0.00089 +/- 0.032	0.063	0.1	U
7440-61-1	U-238	0.80 +/- 0.21	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.338	2.87	pCi/g	66.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812255-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 40-50 Lab ID: 0812255-23	Sample Matrix: SOIL Prep SOP: PAI 778 Rev 12 Date Collected: 19-Sep-08 Date Prepared: 23-Feb-09 Date Analyzed: 03-Mar-09	Prep Batch: AS090223-1 QCBatchID: AS090223-1-1 Run ID: AS090223-1A Count Time: 300 minutes Report Basis: Dry Weight	Final Allquot: 1.01 g Prep Basis: Dry Weight Moisture(%): NA Result Units: pCi/g File Name: Spectrum #1
---	--	---	---

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.42	0.018	0.1	
15117-96-1	U-235	0.096 +/- 0.059	0.049	0.1	LT
7440-61-1	U-238	2.0 +/- 0.40	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.482	3.53	pCi/g	78.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

Client/Project ID: FMI-VRP

Field ID: ST-SB06 300-320D

Lab ID: 0812255-24

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Oct-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QC Batch ID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.86 +/- 0.22	0.052	0.1	
15117-96-1	U-235	0.023 +/- 0.035	0.062	0.1	U
7440-61-1	U-238	1.0 +/- 0.26	0.065	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.273	2.50	pCi/g	58.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812255-1

KA 8/14/12

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 20-40
Lab ID: 0812255-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 21-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.48	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

Date Printed: Thursday, March 19, 2009

ALS Paragon
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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 300-320

Lab ID: 0812255-2

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 28-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.58 +/- 0.25	0.27	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

Date Printed: Thursday, March 19, 2009

ALS Paragon

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: 67-8881-20-48 Lab ID: 0812255-3	Sample Matrix: SOIL Prep SOP: PAI 783 Rev 8 Date Collected: 18-Sep-08 Date Prepared: 20-Feb-09 Date Analyzed: 16-Mar-09	Prep Batch: RE090220-6 QCBatchID: RE090220-6-1 Run ID: RE090220-6A Count Time: 15 minutes Report Basis: Dry Weight	Final Aliquot: 1.02 g Prep Basis: Dry Weight Moisture(%): NA Result Units: pCi/g File Name: Manual Entry
---	---	--	--

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.74	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 40-60
Lab ID: 0812255-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 18-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.57	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 220-240
Lab ID: 0812255-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.46	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Date Printed: Thursday, March 19, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 40-80
Lab ID: 0812255-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.85 +/- 0.34	0.45	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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ALS Paragon
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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 0-20
Lab ID: 0812255-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.0 +/- 0.57	0.74	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Date Printed: Thursday, March 19, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 100-120	Sample Matrix: SOIL	Prep Batch: RE090220-5	Final Aliquot: 1.06 g
Lab ID: 0812255-8	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-5-1	Prep Basis: Dry Weight
	Date Collected: 23-Oct-08	Run ID: RE090220-5A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 11-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.48	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Date Printed: Thursday, March 19, 2009

ALS Paragon
LIMS Version: 6.252A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 160-180
Lab ID: 0812255-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.53	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 220-235.5
Lab ID: 0812255-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 26-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.44	0.24	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 237-255.5
Lab ID: 0812255-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 26-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.94 +/- 0.35	0.33	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 0-20
Lab ID: 0812255-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.51	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 60-80
Lab ID: 0812255-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 22-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.55	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 0-20

Lab ID: 0812255-16

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 19-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6

QCBatchID: RE090220-6-1

Run ID: RE090220-6A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.08 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.44	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 50-60
Lab ID: 0812255-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.65 +/- 0.29	0.22	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

Date Printed: Thursday, March 19, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 80-100
Lab ID: 0812255-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 18-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.94 +/- 0.38	0.36	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

Date Printed: Thursday, March 19, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB08 80-100
Lab ID: 0812255-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.40	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 120-140
Lab ID: 0812255-20

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.50	0.26	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/11/12

Date Printed: Thursday, March 19, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 200-220
Lab ID: 0812255-21

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 26-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 16-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.12 +/- 0.18	0.30	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

Date Printed: Thursday, March 19, 2009

ALS Paragon

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB01 60-80
Lab ID: 0812255-22

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 18-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.87 +/- 0.33	0.31	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812255-1

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Date Printed: Thursday, March 19, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 40-50	Sample Matrix: SOIL	Prep Batch: RE090220-6	Final Aliquot: 1.04 g
Lab ID: 0812255-23	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-6-1	Prep Basis: Dry Weight
	Date Collected: 19-Sep-08	Run ID: RE090220-6A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 17-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.51	0.25	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812255
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 300-320D
Lab ID: 0812255-24

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.10 +/- 0.25	0.43	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812255-1

KA 8/14/12

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 50-60
Lab ID:	0812255-17

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 19-Sep-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.502 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 1.5	3.0	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	37050	32000	ug	86.3	40 - 110 %	
YTTRIUM	8713	4420	ug	50.7	40 - 110 %	
Total				43.8	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812255-1

KA 8/11/12

Date Printed: Friday, February 13, 2009

ALS Paragon

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812255

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB08 80-100
Lab ID:	0812255-19

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 23-Oct-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.507 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 1.2	2.4	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35730	32700	ug	91.4	40 - 110 %	
YTTRIUM	8713	5350	ug	61.4	40 - 110 %	
Total				56.1	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812255-1

KA 8/14/12

Date Printed: Friday, February 13, 2009

ALS Paragon

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SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-258

Sampling Event: August 4th-5th, 11th-13th, September 25th, October 2nd-3rd, 6th, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **No**

Data Reviewer: Katie Abbott

Date Completed: August 14, 2012

Peer Reviewer: Sheri Fling

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for thirty soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
EM-JS-07-5-7	SA	0812258-1	Soil	X	---	X	X ¹
EM-JS-06-0-1	SA	0812258-2	Soil	---	---	X	X ²
EM-JS-06-1-3	SA	0812258-3	Soil	X	---	X	X ¹
EM-JS-07-1-3	SA	0812258-4	Soil	X	---	X	X ¹
EM-JS-06-5-7	SA	0812258-5	Soil	X	---	X	X ¹
EM-JS-06-10-11	SA	0812258-6	Soil	X	---	X	X ¹
CS-JS-02-10-11	SA	0812258-7	Soil	X	---	X	X ¹
RA-JS-02-1-3	SA	0812258-8	Soil	X	X	X	---
RA-JS-02-0-1 D	FD	0812258-9	Soil	---	---	X	X ²
RA-SD-02-1.5-3.0 D	FD	0812258-10	Soil	---	---	X	X ²
RA-SD-01-0-1.5 D	FD	0812258-11	Soil	X	X	X	---
RA-SD-01-1.5-3.0 D	FD	0812258-12	Soil	---	---	X	X ²
EM-JS-07-15-16	SA	0812258-13	Soil	---	---	X	X ²
EM-JS-08-5-7	SA	0812258-14	Soil	X ^m	---	X	X ¹
EM-JS-08-10-12	SA	0812258-15	Soil	X	---	X	X ¹
C-JS-05-1-3	SA	0812258-16	Soil	X	X	X	---
EM-JS-07-10-12	SA	0812258-17	Soil	X	---	X	X ¹
RA-SD-02-0-1.5D	FD	0812258-18	Soil	---	---	X	X ²
ST-SB03 80-100	SA	0812258-19	Soil	---	---	X	X ²
ST-SB04 120-140	SA	0812258-20	Soil	X	---	X	X ¹
ST-SB03 180-200	SA	0812258-21	Soil	---	---	X	X ²
ST-SB03 60-80	SA	0812258-22	Soil	---	---	X	X ²
ST-SB04 100-120	SA	0812258-23	Soil	---	---	X	X ²
ST-SB03 100-120	SA	0812258-24	Soil	---	---	X	X ²
ST-SB03 20-40	SA	0812258-25	Soil	X	---	X	X ¹
ST-SB03 120-140	SA	0812258-26	Soil	---	---	X	X ²
ST-SB03 160-180	SA	0812258-27	Soil	---	---	X	X ²
ST-SB03 40-60	SA	0812258-28	Soil	---	---	X	X ²
ST-SB03 140-160	SA	0812258-29	Soil	---	---	X	X ²
ST-SB01 140-160	SA	0812258-30	Soil	X	---	X	X ¹

Sample Type: SA = Sample FD = Field Duplicate

GFPC – Gas Flow Proportional Counting

X¹– Radium-228

X²- Radium-226 and Radium-228
X^m-Matrix spike

General Overall Assessment:

- _____ Data are usable without qualification.
 _____ **X** Data are usable with qualification (noted below).
 _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP). It was noted on the sample receipt form that the container lids for samples EM-JS-07-5-7, EM-JS-07-15-16, ST-SB03 40-60, ST-SB03 140-160, and ST-SB01 140-160 were received broken. They were replaced at the laboratory upon arrival. No further action was necessary.
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	No	With the exceptions listed in Table 1 below, target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) EM-JS-08-5-7 (Ra-226) Laboratory Duplicate (LD) EM-JS-06-0-1 (Gamma Spectroscopy) ST-SB03 140-160 (Gamma Spectroscopy) ST-SB01 140-160 (Gamma Spectroscopy, Isotopic Uranium) RA-SD-02-1.5-3.0 D (Isotopic Uranium) C-JS-05-1-3 (Isotopic Uranium, Ra-226) EM-JS-07-1-3 (Ra-226) RA-JS-02-1-3 (Ra-226, Ra-228) 	No	The recoveries for the MS analysis were within the laboratory-determined acceptance range. The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event. When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only. The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. With the exceptions summarized below in Table 2, the duplicate error ratio (DER) met the QC criterion.
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	No	Implied Detection Limits No values for radionuclides were reported as detected with associated uncertainties greater than the reported result. Sample Specific Chemical Recoveries The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required.

Review Parameter	Criteria Met?	Comments
		<p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>With the exceptions listed below, the LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.</p> <p><i>Radium-226</i></p> <p>The radium-226 LCS recovery associated with batch RE090220-7 was below acceptance limits of 57-1260% with a recovery of 56.3%. As the potential bias was considered to be low, the associated radium-226 sample results were flagged with an L2</p>
<p>Field Quality Control</p> <ul style="list-style-type: none"> Equipment Blank <p>None</p> <ul style="list-style-type: none"> Field Duplicate <p>RA-SD-02-0-1.5/ RA-SD-02-0-1.5D RA-SD-02-1.5-3.0/ RA-SD-02-1.5-3.0 D RA-SD-01-0-1.5 / RA-SD-01-0-1.5 D RA-JS-02-0-1.0/ RA-JS-02-0-1 D</p>	Yes	<p>Equipment Blank</p> <p>An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed.</p> <p>Field Duplicate (FD)</p> <p>Data Packages 08-12-207 (RA-SD-02-0-1.5, RA-SD-02-1.5-3.0, RA-SD-01-0-1.5, RA-JS-02-0-1.0) / 08-12-258 (RA-SD-02-0-1.5D, RA-SD-02-1.5-3.0 D, RA-SD-01-0-1.5 D, RA-JS-02-0-1 D)</p> <p>The agreement between parent sample results and the field duplicate sample results was evaluated. The duplicate error ratio (DER) met the QC criterion of ≤ 2.</p>
MDCs Met?	No	<p>For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary.</p> <p>All samples for isotopic uranium were prepared at a reduced aliquot; however, all MDC's were met. No further action is necessary.</p>
<p>Other Parameters</p> <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	<p>Gamma Spectroscopy</p> <p>Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples EM-JS-07-5-7, EM-JS-06-0-1, EM-JS-07-1-3, EM-JS-06-5-7, EM-JS-06-10-11, RA-SD-02-1.5-3.0 D, RA-SD-01-1.5-3.0 D, EM-JS-08-5-7, EM-JS-08-10-12, EM-JS-07-10-12, RA-SD-02-0-1.5D, ST-SB03 80-100, ST-SB04 120-140, ST-SB03 180-200, ST-SB04 100-120, ST-SB03 100-120, ST-SB03 20-40, ST-SB03 120-140, ST-SB03 160-180, ST-SB03 40-60, ST-SB03 140-160, and ST-SB01 140-160 did not meet these requirements and were flagged as TI (tentatively identified) by the laboratory and qualified as T4 during data validation.</p> <p>In some cases the sample density is less than or greater than the associated calibration standard density. The density of samples EM-JS-07-5-7, EM-JS-07-1-3, EM-JS-06-10-11, RA-JS-02-0-1 D, RA-SD-02-1.5-3.0 D, RA-SD-01-1.5-3.0 D, EM-JS-07-15-16, EM-JS-08-5-7, EM-JS-08-10-12, RA-SD-02-0-1.5D, ST-SB03 80-100, ST-SB04 120-140, ST-SB03 60-80, ST-SB04 100-120, ST-SB03 100-120, ST-SB03 20-40, ST-SB03 120-140, ST-SB03 160-180, ST-SB03 40-60, ST-SB03 140-160, and ST-SB01 140-160 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.</p>
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

≤ - Less than or equal to

± - Plus or Minus

DER – Duplicate Error Ratio

LCS/LCSD – Laboratory Control Sample/Laboratory Control Sample Duplicate

L2 – The associated blank spike recovery was below laboratory acceptance limits

MDC – Minimum Detectable Concentration

N/A – Not Applicable

QC – Quality Control

T4 – Tentatively Identified Compound

% - Percent

COC – Chain of Custody

ID – Identification

LD – Laboratory Duplicate

MS – Matrix Spike/ Matrix Spike Duplicate

N1 – See Case Narrative

QAPP – Quality Assurance Project Plan

RPD – Relative Percent Difference

TPU – Total Propagated Uncertainty

Table 1: Method Blank Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	Concentration (pCi/g)	Data Qualification
MB Batch as090223-1	Uranium-234	0.0067 ± 0.0083	None. All associated uranium-234 results were reported at concentrations >10x the blank contamination.

pCi/g – Picocuries per gram

B4 = Target analyte detected in the blank outside of the method acceptance criteria.

Table 2: DER Outliers and Resultant Data Qualification (Laboratory Duplicate)

Isotopic Uranium			
Sample	Analyte	DER	Data Qualification
C-JS-05-1-3	Uranium-235	1.5	The DERs between the parent sample and laboratory duplicate sample for uranium-235 exceeded the criterion of ≤1.0. Therefore, the associated analytical results were qualified as estimated N6.

DER – Duplicate Error Ratio

N6 – Data suspect due to quality control failure, data reported per data user's result.

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-176

Sampling Event: July 23rd, 28th, and 29th, 2008Sample-specific Parameter Review? **Yes**

Data Reviewer: Katie Abbott

Peer Reviewer: Sheri Fling

Laboratory Performance Parameters? **No**

Date Completed: August 8, 2012

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for eighteen soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses		
				Radium-226 Method 903.1	Isotopic Uranium	Gamma Spectroscopy
OD-SD-02-1.5-30	SA	0812175-1	Soil	X	X	X ¹
OD-SD-04-0-1.5	SA	0812175-2	Soil	X	X	X ¹
OD-SD-04-1.5-3.0	SA	0812175-3	Soil	X	X	X ¹
OD-SD-03-0-1.5	SA	0812175-4	Soil	X	X	X ¹
OD-SD-03-1.5-3.0	SA	0812175-5	Soil	---	X	X ²
CP-SD-07-1.5-3.0	SA	0812175-6	Soil	---	X	X ²
CP-P12-0-1	SA	0812175-7	Soil	X	X	X ¹
OD-SD-05-0-1.5	SA	0812175-8	Soil	X	X	X ¹
OD-SD-01-0-1.5	SA	0812175-9	Soil	X	X	X ¹
OD-SD-01-1.5-3.0	SA	0812175-10	Soil	X ^m	X	X ¹
OD-SD-06-0-1.5	SA	0812175-11	Soil	X	X	X ¹
OD-SD-06-1.5-3.0	SA	0812175-12	Soil	---	X	X ²
OD-JS-01-0-1	SA	0812175-13	Soil	X	X	X ¹
OD-JS-02-0-1	SA	0812175-14	Soil	X	X	X ¹
OD-JS-02-1-3	SA	0812175-15	Soil	X	X	X ¹
EM-C22-0-1	SA	0812175-16	Soil	X	X	X ¹
EM-E24-0-1	SA	0812175-17	Soil	X	X	X ¹
EM-E24-1-3	SA	0812175-18	Soil	X	X	X ¹
CP-SD-01-0-1.5*	SA	---	Soil	---	---	---
EM-C22-5-7*	SA	---	Soil	---	---	---

Sample Type: SA = Sample

X¹- Radium-228X²- Radium-226 and Radium-228X^m-Matrix spike

*-Samples received at laboratory broken and could not be analyzed

General Overall Assessment:

- _____ Data are usable without qualification.
- X Data are usable with qualification (noted below).
- _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP). It was noted on the sample receipt form that samples CP-SD-01-0-1.5 and EM-C22-5-7 were received at the laboratory broken; therefore, the requested analyses were not performed.
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	No	With the exceptions listed in Table 1 below, target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike (MS) OD-SD-01-1.5-3.0 (Radium-226) Laboratory Duplicate (LD) OD-SD-03-0-1.5 (Gamma Spectroscopy) OD-SD-06-1.5-3.0 (Gamma Spectroscopy) OD-JS-01-0-1 (Gamma Spectroscopy) OD-SD-03-1.5-3.0 (Isotopic Uranium) OD-JS-02-1-3 (Isotopic Uranium) OD-SD-02-1.5-30 (Radium-226) OD-SD-01-1.5-3.0 (Radium-226) 	Yes	The recoveries for the MS analysis were within the laboratory-determined acceptance range. Data qualification was not necessary. The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event. When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not meet the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only. The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. The duplicate error ratio (DER) met the QC criterion of ≤ 1 .
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	Implied Detection Limits No values for radionuclides were reported as detected with associated uncertainties greater than the reported result Sample Specific Chemical Recoveries The sample specific recoveries were with the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required. Laboratory Control Sample/ Laboratory Control Sample Duplicate The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.
Field Quality Control <ul style="list-style-type: none"> Equipment Blank None Field Duplicate None 	No	Equipment Blank An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed. Field Duplicate (FD) A field duplicate was not reported in this data package. The frequency of field duplicates did not meet the QAPP required 1 per 20 samples submitted.

Review Parameter	Criteria Met?	Comments
MDCs Met?	No	For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary. All samples for isotopic uranium were prepared at a reduced aliquot; therefore, some of the MDCs were not met. However, all detected results were reported above the MDCs achieved. No further action is necessary.
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples OD-SD-04-1.5-3.0, CP-P12-0-1, OD-JS-01-0-1, OD-JS-02-0-1, and EM-E24-1-3 did not meet these requirements and were flagged by the laboratory as TI (tentatively identified) and were qualified as T4 during data validation. In some cases the sample density was less than or greater than the associated calibration standard density. The density of sample OD-SD-06-0-1.5 exceeded the density of the calibration standard (limit of $\pm 15\%$) and was flagged by the laboratory as G and was qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

\leq - Less than or equal to

\pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS - Matrix Spike

N1 - See Case Narrative

QAPP - Quality Assurance Project Plan

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

QC - Quality Control

T4 - Tentatively Identified Compound

Table 1: Method Blank Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	Concentration (pCi/g)	Data Qualification
MB Batch AS090127-5	Uranium-235	0.023 ± 0.028	All associated isotopic uranium-235 results reported as detected at concentrations $< 10\times$ the blank contamination were flagged with a B4.

pCi/g - Picocuries per gram

B4 = Target analyte detected in the blank outside of the method acceptance criteria.

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-177

Sampling Event: July 16th, 17th, 23rd, and 28th, 2008Sample-specific Parameter Review? **Yes**

Data Reviewer: Katie Abbott

Peer Reviewer: Sheri Fling

Laboratory Performance Parameters? **No**

Date Completed: August 8, 2012

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for twenty soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
CP-SD-01-0-1.5	SA	0812177-1	Soil	X	---	X	X ¹
CP-SD-01-1.5-3.0	SA	0812177-2	Soil	---	---	X	X ²
CP-SD-02-0-1.5	SA	0812177-3	Soil	---	---	X	X ²
CP-SD-02-1.5-3.0	SA	0812177-4	Soil	X	---	X	X ¹
CP-SD-06-0-1.5	SA	0812177-5	Soil	---	---	X	X ²
CP-SD-06-1.5-3.0	SA	0812177-6	Soil	---	---	X	X ²
CP-SD-05-0-1.5	SA	0812177-7	Soil	---	---	X	X ²
CP-SD-05-1.5-3.0	SA	0812177-8	Soil	X	---	X	X ¹
CP-SD-03-0-1.5	SA	0812177-9	Soil	X	---	X	X ¹
CP-SD-03-1.5-3.0	SA	0812177-10	Soil	---	---	X	X ²
CP-P07-1-3	SA	0812177-11	Soil	X	---	X	X ¹
CP-P07-0-1	SA	0812177-12	Soil	X	---	X	X ¹
CP-P07-5-7	SA	0812177-13	Soil	X	X	X	---
CP-SD-04-0-1.5	SA	0812177-14	Soil	X	---	X	X ¹
CP-SD-04-1.5-3.0	SA	0812177-15	Soil	X	---	X	X ¹
CP-Q09-1-3	SA	0812177-16	Soil	---	---	X	X ²
CP-SD-09-0-1.5	SA	0812177-17	Soil	X	---	X	X ¹
CP-SD-09-1.5-3.0	SA	0812177-18	Soil	X	---	X	X ¹
CP-P12-1-3	SA	0812177-19	Soil	X	---	X	X ¹
OD-SD-02-0-1.5	SA	0812177-20	Soil	X	---	X	X ¹

Sample Type: SA = Sample
 GFPC – Gas Flow Proportional Counting
 X¹ - Radium-228
 X² - Radium-226 and Radium-228
 X^m - Matrix spike

General Overall Assessment:

_____ Data are usable without qualification.
 X Data are usable with qualification (noted below).
 _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	Yes	Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP).
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks. Data qualification was not required.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike (MS) None Laboratory Duplicate (LD) CP-SD-01-1.5-3.0 (Gamma Spectroscopy, Isotopic Uranium) CP-P12-1-3 (Gamma Spectroscopy) CP-SD-09-0-1.5 (Isotopic Uranium) CP-SD-01-0-1.5 (Radium-226) 	Yes	<p>The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event. An MS was not reported in this data package.</p> <p>When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not meet the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only.</p> <p>The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. The duplicate error ratio (DER) met the QC criterion of ≤ 1</p>
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	<p>Implied Detection Limits</p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p>Sample Specific Chemical Recoveries</p> <p>The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required.</p> <p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.</p>
Field Quality Control <ul style="list-style-type: none"> Equipment Blank None Field Duplicate None 	No	<p>Equipment Blank</p> <p>An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed.</p> <p>Field Duplicate (FD)</p> <p>A field duplicate was not reported in this data package. The frequency of field duplicates did not meet the QAPP required 1 per 20 samples submitted.</p>
MDCs Met?	No	<p>For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary.</p> <p>All samples for isotopic uranium were prepared at a reduced aliquot; therefore, some of the MDCs were not met. However, all detected results were reported above the MDCs achieved. No further action is necessary.</p>

Review Parameter	Criteria Met?	Comments
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples CP-SD-02-0-1.5, CP-SD-03-0-1.5, CP-SD-03-1.5-3.0, CP-SD-04-1.5-3.0, and CP-Q09-1-3 did not meet these requirements and were flagged TI (tentatively identified) by the laboratory and qualified as T4 during data validation. In some cases the sample density was less than or greater than the associated calibration standard density. The density of samples CP-P07-1-3, CP-P07-0-1, CP-SD-04-1.5-3.0, and CP-P12-1-3 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

\leq - Less than or equal to

\pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS - Matrix Spike

N1 - See Case Narrative

QAPP - Quality Assurance Project Plan

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

QC - Quality Control

T4 - Tentatively Identified Compound

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-178

Sampling Event: July 11th, 14th, and 15th, 2008Sample-specific Parameter Review? **Yes**

Data Reviewer: Katie Abbott

Peer Reviewer: Sheri Fling

Laboratory Performance Parameters? **No**

Date Completed: August 8, 2012

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for eighteen soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
CP-JS-02-1-3	SA	0812178-1	Soil	---	---	X	X ²
CP-O09-0-1	SA	0812178-2	Soil	X	X	X	---
CP-O09-1-3	SA	0812178-3	Soil	X	---	X	X ¹
CP-O09-5-7	SA	0812178-4	Soil	X	---	X	X ¹
CP-O09-10-12	SA	0812178-5	Soil	X	---	X	X ¹
CP-O09-15-17	SA	0812178-6	Soil	X	---	X	X ¹
CP-JS-01-0-1	SA	0812178-7	Soil	X	X	X	---
CP-JS-01-1-3	SA	0812178-8	Soil	X	---	X	X ¹
CP-JS-01-5-7	SA	0812178-9	Soil	---	---	X	X ²
CP-P04-0-1	SA	0812178-10	Soil	X	---	X	X ¹
CP-P04-1-3	SA	0812178-11	Soil	---	---	X	X ²
CP-P05-0-1	SA	0812178-12	Soil	X	---	X	X ¹
CP-P05-1-3	SA	0812178-13	Soil	---	---	X	X ²
CP-JS-01-10-12	SA	0812178-14	Soil	X	---	X	X ¹
EV-JS-01-5-7	SA	0812178-15	Soil	---	---	X	X ²
EV-JS-02-1-3	SA	0812178-16	Soil	---	---	X	X ²
EV-JS-02-0-1	SA	0812178-17	Soil	X ^m	---	X	X ¹
EV-JS-02-5-7	SA	0812178-18	Soil	---	---	X	X ²

Sample Type: SA = Sample
 GFPC – Gas Flow Proportional Counting
 X¹- Radium-228
 X²- Radium-226 and Radium-228
 X^m-Matrix spike

General Overall Assessment:

_____ Data are usable without qualification.
 _____ **X** Data are usable with qualification (noted below).
 _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	Yes	Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP).
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	No	With the exceptions listed in Table 1 below, target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) EV-JS-02-0-1 (Radium-226) Laboratory Duplicate (LD) EV-JS-02-5-7 (Gamma Spectroscopy) CP-O09-10-12 (Gamma Spectroscopy) CP-O09-1-3 (Isotopic Uranium) EV-JS-02-1-3 (Isotopic Uranium) CP-O09-5-7 (Radium-226) CP-O09-0-1 (Radium-228) 	No	<p>The recoveries for the MS analysis were within the laboratory-determined acceptance range.</p> <p>The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event.</p> <p>When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only.</p> <p>The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. With the exceptions summarized below in Table 2, the duplicate error ratio (DER) met the QC criterion.</p>
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	<p>Implied Detection Limits</p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p>Sample Specific Chemical Recoveries</p> <p>The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required.</p> <p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.</p>
Field Quality Control <ul style="list-style-type: none"> Equipment Blank None Field Duplicate None 	No	<p>Equipment Blank</p> <p>An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed.</p> <p>Field Duplicate (FD)</p> <p>A field duplicate was not reported in this data package. The frequency of field duplicates did not meet the QAPP required 1 per 20 samples submitted.</p>
MDCs Met?	No	<p>For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary.</p> <p>All samples for isotopic uranium were prepared at a reduced aliquot; however, all MDC's were met. No further action is necessary.</p>

Review Parameter	Criteria Met?	Comments
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy <p>Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples CP-JS-02-1-3, CP-O09-5-7, CP-O09-10-12, CP-O09-15-17, CP-JS-01-1-3, CP-JS-01-5-7, CP-P04-0-1, and EV-JS-02-0-1 did not meet these requirements and were flagged TI by the laboratory and qualified as T4 (tentatively identified) during data validation.</p> <p>In some cases the sample density was less than or greater than the associated calibration standard density. The density of samples CP-JS-02-1-3, EV-JS-02-5-7, and EV-JS-02-5-7 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.</p>
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

\leq - Less than or equal to

\pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS - Matrix Spike

N1 - See Case Narrative

QAPP - Quality Assurance Project Plan

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

QC - Quality Control

T4 - Tentatively Identified Compound

Table 1: Method Blank Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	Concentration (pCi/g)	Data Qualification
MB Batch AS090130-1	Uranium-234	0.043 ± 0.035	All associated isotopic uranium-234 results reported as detected at concentrations $<10\times$ the blank contamination were flagged with a B4.

pCi/g - Picocuries per gram

Table 2: DER Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	DER	Data Qualification
CP-O09-1-3	Uranium-235	1.1	The DERs between the parent sample and laboratory duplicate sample for uranium-235 exceeded the criterion of ≤ 1.0 . Therefore, the associated analytical results were qualified as estimated N6.
Radium-228 (By GFPC)			
Sample	Analyte	DER	Data Qualification
CP-O09-0-1	Radium-228	1.3	The DERs between the parent sample and laboratory duplicate sample for radium-228 exceeded the criterion of ≤ 1.0 . Therefore, the associated analytical results were qualified as estimated N6.

DER – Duplicate Error Ratio

GFPC – Gas Flow Proportional Counting

N6 – Data suspect due to quality control failure, data reported per data user's result.

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-207
 Sampling Event: August 7th and 11th, 2008
 Sample-specific Parameter Review? **Yes**
 Data Reviewer: Katie Abbott
 Peer Reviewer: Sheri Fling

Laboratory Performance Parameters? **No**
 Date Completed: August 9, 2012
 Date Completed: August 17, 2012

This report summarizes the verification of analytical data for fourteen soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
RA-JS-04-0-1	SA	0812207-1	Soil	---	---	X	X ²
RA-JS-04-1-2.5	SA	0812207-2	Soil	X	---	X	X ¹
RA-JS-03-1-3	SA	0812207-3	Soil	X	---	X	X ¹
RA-JS-05-1-3	SA	0812207-4	Soil	X	---	X	X ¹
EP-P24-0-1	SA	0812207-5	Soil	---	---	X	X ²
EM-P24-5-7	SA	0812207-6	Soil	X	---	X	X ¹
RA-JS-01-0-1	SA	0812207-7	Soil	X	X	X	---
RA-JS-01-5-7	SA	0812207-8	Soil	X	---	X	X ¹
RA-SD-02-0-1.5	SA	0812207-9	Soil	---	---	X	X ²
RA-SD-02-1.5-3.0	SA	0812207-11	Soil	---	---	X	X ²
RA-SD-01-0-1.5	SA	0812207-12	Soil	---	---	X	X ²
RA-JS-02-0-1.0	SA	0812207-14	Soil	---	---	X	X ²
RA-JS-02-1-3	SA	0812207-17	Soil	---	---	X	X ²
RA-JS-01-1.5-3.0	SA	0812207-19	Soil	---	---	X	X ²

Sample Type: SA = Sample
 GFPC – Gas Flow Proportional Counting
 X¹ - Radium-228
 X² - Radium-226 and Radium-228

General Overall Assessment:

_____ Data are usable without qualification.
 X _____ Data are usable with qualification (noted below).
 _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
<i>Sample-specific Parameters</i>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	<p>Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP).</p> <p>It was noted on the sample receipt form that the collection time listed on the container label did not match the collection time listed on the chain of custody (COC) for sample RA-JS-05-1-3. The sample was logged in per the COC. In addition, the container lid for sample RA-JS-04-0-1 was received broken. It was replaced at the laboratory upon arrival. No further action was necessary.</p>
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	No	With the exceptions listed in Table 1 below, target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) None <ul style="list-style-type: none"> Laboratory Duplicate (LD) EM-P24-0-1 (Gamma Spectroscopy) RA-SD-02-0-1.5 (Gamma Spectroscopy) RA-JS-01-1.5-3.0 (Gamma Spectroscopy) RA-JS-03-1-3 (Isotopic Uranium) RA-JS-05-1-3 (Radium-226)	Yes	<p>The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event. An MS was not reported in this data package.</p> <p>When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only.</p> <p>The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. The duplicate error ratio (DER) met the QC criterion of ≤ 1.</p>
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	<p>Implied Detection Limits</p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p>Sample Specific Chemical Recoveries</p> <p>The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required.</p> <p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.</p>
Field Quality Control <ul style="list-style-type: none"> Equipment Blank None <ul style="list-style-type: none"> Field Duplicate RA-SD-02-0-1.5/ RA-SD-02-0-1.5D RA-SD-02-1.5-3.0/ RA-SD-02-1.5-3.0 D RA-SD-01-0-1.5 / RA-SD-01-0-1.5 D RA-JS-02-0-1.0/ RA-JS-02-0-1 D	No	<p>Equipment Blank</p> <p>An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed.</p> <p>Data Packages 08-12-207 (RA-SD-02-0-1.5, RA-SD-02-1.5-3.0, RA-SD-01-0-1.5, RA-JS-02-0-1.0) / 08-12-258 (RA-SD-02-0-1.5D, RA-SD-02-1.5-3.0 D, RA-SD-01-0-1.5 D, RA-JS-02-0-1 D)</p> <p>The agreement between parent sample results and the field duplicate sample results was evaluated. The DER met the QC criterion of ≤ 2.</p>
MDCs Met?	No	For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is

Review Parameter	Criteria Met?	Comments
		necessary. All samples for isotopic uranium were prepared at a reduced aliquot; however, all MDC's were met. No further action is necessary.
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples RA-SD-02-0-1.5, RA-SD-02-1.5-3.0, and RA-SD-01-0-1.5 did not meet these requirements and were flagged as TI by the laboratory and T4 (tentatively identified) during data validation. In some cases the sample density was less than or greater than the associated calibration standard density. The density of samples RA-JS-03-1-3, RA-JS-01-5-7, RA-SD,02-0-1.5, RA-SD-02-1.5-3.0, RA-SD-01-0-1.5, RA-JS-02-0-1.0, RA-JS-02-0-1.0, RA-JS-02-1-3 and RA-JS-01-1.5-3.0 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

\leq - Less than or equal to

\pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS - Matrix Spike

N1 - See Case Narrative

QAPP - Quality Assurance Project Plan

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

QC - Quality Control

T4 - Tentatively Identified Compound

Table 1: Method Blank Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	Concentration (pCi/g)	Data Qualification
MB Batch AS090217-1	Uranium-235	0.021 ± 0.026	All associated isotopic uranium-235 results reported as detected at concentrations $<10\times$ the blank contamination were flagged with a B4.

pCi/g - Picocuries per gram

B4 = Target analyte detected in the blank outside of the method acceptance criteria.

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-208

Sampling Event: August 7th, 12th, 13th, and 27th, 2008Sample-specific Parameter Review? **Yes**Laboratory Performance Parameters? **No**

Data Reviewer: Katie Abbott

Date Completed: August 9, 2012

Peer Reviewer: Sheri Fling

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for twenty-five soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses		
				Radium-226 Method 903.1	Isotopic Uranium	Gamma Spectroscopy
RP-JS-02-5-7	SA	0812208-2	Soil	X	X	X ¹
RP-JS-02-10-12	SA	0812208-3	Soil	---	X	X ²
RP-JS-02-15-17	SA	0812208-4	Soil	---	X	X ²
RP-JS-01-1-3	SA	0812208-5	Soil	---	X	X ²
RP-JS-01-5-7	SA	0812208-6	Soil	X	X	X ¹
RP-JS-01-0-1	SA	0812208-7	Soil	X	X	X ¹
RP-JS-01-10-12	SA	0812208-8	Soil	---	X	X ²
RP-JS-05-0-1	SA	0812208-9	Soil	X	X	X ¹
RP-JS-01-15-17	SA	0812208-10	Soil	---	X	X ²
EM-P24-1-3	SA	0812208-11	Soil	X	X	X ¹
RA-JS-01-1-3	SA	0812208-12	Soil	X	X	X ¹
RA-JS-03-0-1	SA	0812208-13	Soil	X	X	X ¹
EM-P24-10-11	SA	0812208-14	Soil	X	X	X ¹
RP-JS-02-1-3D	FD	0812208-15	Soil	X ^m	X	X ¹
EM-JS-08-0-1	SA	0812208-16	Soil	X	X	X ¹
EM-JS-08-1-3D	FD	0812208-17	Soil	---	X	X ²
CP-JS-04-0-1	SA	0812208-18	Soil	X	X	X ¹
CP-JS-04-1-3	SA	0812208-19	Soil	---	X	X ²
CP-JS-04-5-7	SA	0812208-21	Soil	---	X	X ²
CP-JS-04-10-12	SA	0812208-22	Soil	X	X	X ¹
CP-JS-04-20	SA	0812208-23	Soil	---	X	X ²
OD-JS-03-0-1	SA	0812208-24	Soil	---	X	X ²
RP-JS-02-1-3	SA	0812208-25	Soil	X	X	X ¹
EM-JS-08-1-3	SA	0812208-26	Soil	---	X	X ²
EM-JS-07-0-1	SA	0812208-27	Soil	X	X	X ¹
RP-JS-02-0-1*	SA	---	Soil	---	---	---
CP-JS-04-15-17*	SA	---	Soil	---	---	---
OD-JS-03-1-3D*	SA	---	Soil	---	---	---

Sample Type: SA = Sample

FD = Field Duplicate

X¹ - Radium-228X² - Radium-226 and Radium-228X^m - Matrix spike

*-Samples received at laboratory broken

General Overall Assessment:

_____	Data are usable without qualification.
<u> X </u>	Data are usable with qualification (noted below).
_____	Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	<p>Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP).</p> <p>It was noted on the sample receipt form that the collection time listed on the container label did not match the collection time listed on the chain of custody (COC) for sample RP-JS-05-0-1. The sample was logged in per the COC. In addition, the containers for samples RP-JS-02-0-1, CP-JS-04-15-17, and OD-JS-03-1-3D were received at the laboratory broken; therefore, the analyses were not performed.</p>
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	No	With the exceptions listed in Table 1 below, target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) RP-JS-02-1-3D (Radium-226) Laboratory Duplicate (LD) RP-JS-02-5-7 (Gamma Spectroscopy) EM-P24-10-11 (Gamma Spectroscopy) RP-JS-01-1-3 (Isotopic Uranium) RP-JS-02-1-3D (Isotopic Uranium) EM-JS-08-1-3 (Isotopic Uranium) EM-JS-08-0-1 (Radium-226) CP-JS-04-10-12 (Radium-226) 	No	<p>With the exception listed in Table 2 below, the recoveries for the MS analysis were within the laboratory-determined acceptance range.</p> <p>The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event.</p> <p>When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only.</p> <p>The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. The duplicate error ratio (DER) met the QC criterion of ≤ 1.</p>
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	<p>Implied Detection Limits</p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p>Sample Specific Chemical Recoveries</p> <p>The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required.</p> <p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>The LCS/LCSD recoveries were within the laboratory acceptance limits. Data</p>

Review Parameter	Criteria Met?	Comments
		qualification was not required.
Field Quality Control <ul style="list-style-type: none"> Equipment Blank Field Duplicate None RP-JS-02-1-3/ RP-JS-02-1-3D EM-JS-08-1-3/ EM-JS-08-1-3D	No	Equipment Blank An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed. Field Duplicate (FD) The agreement between parent sample results and the field duplicate sample results was evaluated. The DER met the QC criterion of ≤ 2 .
MDCs Met?	No	For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary. All samples for isotopic uranium were prepared at a reduced aliquot; therefore, some of the MDCs were not met. However, all detected results were reported above the MDCs achieved. No further action is necessary.
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples RP-JS-02-5-7, RP-JS-02-10-12, RP-JS-02-15-17, RP-JS-01-1-3, RP-JS-01-5-7, RP-JS-01-10-12, RP-JS-01-15-17, RA-JS-01-1-3, RA-JS-03-0-1, RP-JS-02-1-3D, EM-JS-08-0-1, EM-JS-08-1-3D, CP-JS-04-10-12, CP-JS-04-20, RP-JS-02-1-3, and EM-JS-08-1-3 did not meet these requirements and were flagged TI (tentatively identified) by the laboratory and were qualified as T4 during data validation. In some cases the sample density was less than or greater than the associated calibration standard density. The density of samples RP-JS-02-5-7, RP-JS-02-10-12, RP-JS-02-15-17, RP-JS-01-1-3, RP-JS-01-5-7, RP-JS-01-0-1, RP-JS-01-10-12, RP-JS-01-10-12, RA-JS-05-0-1, RP-JS-01-15-17, RA-JS-01-1-3, EM-P24-10-11, RP-JS-02-1-3D, EM-JS-08-1-3D, CP-JS-04-5-7, CP-JS-04-20, RP-JS-02-1-3, and EM-JS-08-1-3 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

\leq - Less than or equal to

\pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS - Matrix Spike

N1 - See Case Narrative

QAPP - Quality Assurance Project Plan

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

QC - Quality Control

T4 - Tentatively Identified Compound

Table 1: Method Blank Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	Concentration (pCi/g)	Data Qualification
MB Batch AS090210-3	Uranium-238	0.025 ± 0.021	None. All associated uranium-238 results were reported at concentrations >10x the blank contamination.
MB Batch AS090217-1	Uranium-235	0.021 ± 0.026	All associated isotopic uranium-235 results reported as detected at concentrations <10x the blank contamination were flagged with a B4.

pCi/g – Picocuries per gram

B4 = Target analyte detected in the blank outside of the method acceptance criteria.

Table 2: Matrix Spike Outliers and Resultant Data Qualification

Radium-226 Method 903.1			
Sample	Analyte	MS %R (Limits)	Data Qualification
RP-JS-02-1-3D	Radium-226	131 (57-126)	As the potential bias was considered to be high, the radium-226 result for sample RP-JS-02-1-3D was flagged as (M1).

%R – Percent Recovery

M1 – Matrix spike recovery was high; the associated blank spike recovery was acceptable.

MS – Matrix Spike

Bold indicates a recovery outside of acceptance limits.**Table 3: DER Outliers and Resultant Data Qualification**

Sample	Analyte	DER	Data Qualification
Radium-226 Method 903.1			
CP-JS-04-10-12	Radium-226	1.8	The DERs between the parent sample and laboratory duplicate sample for radium-226 exceeded the criterion of ≤1.0. Therefore, the associated analytical results were qualified as estimated N6.

DER – Duplicate Error Ratio

N6 – Data suspect due to quality control failure, data reported per data user's result.

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-210

Sampling Event: August 5th, 6th, 7th, and 11th, 2008Sample-specific Parameter Review? **Yes**

Data Reviewer: Katie Abbott

Peer Reviewer: Sheri Fling

Laboratory Performance Parameters? **No**

Date Completed: August 10, 2012

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for seventeen soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
C-JS-04-5-7	SA	0812210-1	Soil	X	---	X	X ¹
C-JS-04-10-12	SA	0812210-2	Soil	X	---	X	X ¹
C-JS-04-15-16	SA	0812210-3	Soil	---	---	X	X ²
C-JS-04-0-1	SA	0812210-4	Soil	X	---	X	X ¹
C-JS-04-1-3	SA	0812210-5	Soil	X	---	X	X ¹
C-JS-04-5-7	SA	0812210-6	Soil	X	---	X	X ¹
EM-X26-0-1	SA	0812210-7	Soil	X	---	X	X ¹
EM-X26-1-3	SA	0812210-8	Soil	X	X	X	---
EM-U25-0-1	SA	0812210-9	Soil	X	---	X	X ¹
EM-U25-1-3	SA	0812210-10	Soil	X	---	X	X ¹
EM-U25-5-5.5	SA	0812210-11	Soil	---	---	X	X ²
EM-N29-1-3	SA	0812210-12	Soil	X	---	X	X ¹
RA-SD-02-1.5-3.0	SA	0812210-16	Soil	---	---	X	X ²
EM-N29-0-1	SA	0812210-17	Soil	X	---	X	X ¹
EM-X26-5-7	SA	0812210-18	Soil	X	---	X	X ¹
EM-G27-0-1	SA	0812210-19	Soil	X	---	X	X ¹
EM-G27-1-3	SA	0812210-20	Soil	X	---	X	X ¹

Sample Type: SA = Sample
 GFPC – Gas Flow Proportional Counting
 X¹ - Radium-228
 X² - Radium-226 and Radium-228

General Overall Assessment:

_____ Data are usable without qualification.
 X Data are usable with qualification (noted below).
 _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP). It was noted on the sample receipt form that the container lid for samples EM-U25-0-1 and EM-U25-1-3 were received broken. They were replaced at the laboratory upon arrival. No further action was necessary.
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks. Data qualification was not required.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) None <ul style="list-style-type: none"> Laboratory Duplicate (LD) RA-SD-02-1.5-3.0 (Gamma Spectroscopy) C-JS-04-5-7 (Gamma Spectroscopy) C-JS-04-15-16 (Isotopic Uranium) EM-N29-1-3 (Isotopic Uranium) EM-U25-0-1 (Radium-226) CP-JS-04-10-12 (Radium-226)	No	The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event. An MS was not reported in this data package. When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only. The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. With the exceptions summarized below in Table 1, the duplicate error ratio (DER) met the QC criterion.
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	Implied Detection Limits No values for radionuclides were reported as detected with associated uncertainties greater than the reported result. Sample Specific Chemical Recoveries The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required. Laboratory Control Sample/ Laboratory Control Sample Duplicate The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.
Field Quality Control <ul style="list-style-type: none"> Equipment Blank None <ul style="list-style-type: none"> Field Duplicate RA-SD-02-1.5-3.0/ RA-SD-02-1.5-3.0 D	No	Equipment Blank An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed. Data Packages 08-12-210 (RA-SD-02-1.5-3.0)/ 08-12-258 (RA-SD-02-1.5-3.0 D) The agreement between parent sample results and the field duplicate sample results was evaluated. The DER met the QC criterion of ≤ 2 .

Review Parameter	Criteria Met?	Comments
MDCs Met?	No	For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary. All samples for isotopic uranium were prepared at a reduced aliquot; therefore, some of the MDCs were not met. However, all detected results were reported above the MDCs achieved. No further action is necessary.
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples C-JS-04-10-12, C-JS-04-15-16, C-JS-04-1-3, EM-X26-0-1, EM-U25-0-1, EM-U25-1-3, EM-N29-1-3, EM-G27-0-1, and EM-G27-1-3 did not meet these requirements and were flagged as TI by the laboratory and were qualified as T4 (tentatively identified) during data validation. In some cases the sample density was less than or greater than the associated calibration standard density. The density of samples C-JS-04-10-12, EM-X26-0-1, EM-U25-1-3, RA-SD-02-1.5-3.0, and EM-G27-1-3 exceeded the limit of $\pm 15\%$ of the density of the calibration standard and were flagged by the laboratory as G and were qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

\leq - Less than or equal to

\pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS - Matrix Spike

N1 - See Case Narrative

QAPP - Quality Assurance Project Plan

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

QC - Quality Control

T4 - Tentatively Identified Compound

Table 1: DER Outliers and Resultant Data Qualification

Radium-226 (Method 903.1)			
Sample	Analyte	DER	Data Qualification
EM-U25-0-1	Radium-226	1.9	The DERs between the parent sample and laboratory duplicate sample for radium-226 exceeded the criterion of ≤ 1.0 . Therefore, the associated analytical results were qualified as estimated N6.

DER - Duplicate Error Ratio

N6 - Data suspect due to quality control failure, data reported per data user's result.

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-211

Sampling Event: July 31st, August 4th and 5th, 2008Sample-specific Parameter Review? **Yes**

Data Reviewer: Katie Abbott

Peer Reviewer: Sheri Fling

Laboratory Performance Parameters? **No**

Date Completed: August 10, 2012

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for nineteen soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
C-JS-03-5-7	SA	0812211-1	Soil	X	---	X	X ¹
C-JS-03-10-12	SA	0812211-2	Soil	---	---	X	X ²
C-JS-03-15-17	SA	0812211-3	Soil	---	---	X	X ²
CS-JS-01-1-3	SA	0812211-4	Soil	X ^m	---	X	X ¹
CS-JS-01-5-7	SA	0812211-5	Soil	X	---	X	X ¹
EM-H22-5-7	SA	0812211-6	Soil	---	---	X	X ²
EM-K24-0-1	SA	0812211-7	Soil	---	---	X	X ²
EM-K24-1-3	SA	0812211-8	Soil	---	---	X	X ²
EM-K24-5-7	SA	0812211-9	Soil	---	---	X	X ²
CS-JS-01-10-12	SA	0812211-10	Soil	X	---	X	X ¹
CS-JS-02-0-1	SA	0812211-11	Soil	X	---	X	X ¹
CS-JS-02-1-3	SA	0812211-12	Soil	X	---	X	X ¹
CS-JS-02-5-7	SA	0812211-13	Soil	---	---	X	X ²
CS-JS-03-0-1	SA	0812211-14	Soil	X	---	X	X ¹
CS-JS-03-1-3	SA	0812211-15	Soil	X	---	X	X ¹
CS-JS-03-5-7	SA	0812211-16	Soil	X	---	X	X ¹
CS-JS-03-10-12	SA	0812211-17	Soil	---	---	X	X ²
C-JS-04-0-1	SA	0812211-18	Soil	X	X	X	---
C-JS-04-1-3	SA	0812211-19	Soil	X	---	X	X ¹
C-JS-03-5-7*	SA	---	Soil	---	---	---	---
CS-JS-01-5-7*	SA	---	Soil	---	---	---	---

Sample Type: SA = Sample

GFPC – Gas Flow Proportional Counting

X¹ - Radium-228X² - Radium-226 and Radium-228X^m - Matrix spike

* - Samples received at laboratory broken and could not be analyzed

General Overall Assessment:

- _____ Data are usable without qualification.
- X Data are usable with qualification (noted below).
- _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	<p>Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP).</p> <p>It was noted on the sample receipt form that the container label for sample CS-JS-02-1-3 listed the identification (ID) as CS-JS-01-1-3. The laboratory was able to correctly ID the sample by matching the collection time and date to the ID on the chain of custody (COC). In addition, samples C-JS-03-5-7 and CS-JS-01-5-7 were received at the laboratory broken; therefore, the analyses were not performed.</p>
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	No	With the exceptions listed in Table 1 below, target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) CS-JS-01-1-3 (Radium-226) Laboratory Duplicate (LD) C-JS-03-5-7 (Gamma Spectroscopy) CS-JS-01-5-7 (Isotopic Uranium) C-JS-04-1-3 (Isotopic Uranium) CS-JS-03-0-1 (Radium-226) 	No	<p>With the exception listed in Table 2 below, the recoveries for the MS analysis were within the laboratory-determined acceptance range.</p> <p>The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event.</p> <p>When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only.</p> <p>The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. The duplicate error ratio (DER) met the QC criterion of ≤ 1.</p>
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	<p>Implied Detection Limits</p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p>Sample Specific Chemical Recoveries</p> <p>The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required.</p> <p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.</p>
Field Quality Control <ul style="list-style-type: none"> Equipment Blank None Field Duplicate None 	No	<p>Equipment Blank</p> <p>An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed.</p>

Review Parameter	Criteria Met?	Comments
		Field Duplicate (FD) A field duplicate was not reported in this data package. The frequency of field duplicates did not meet the QAPP required 1 per 20 samples submitted.
MDCs Met?	No	For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary. All samples for isotopic uranium were prepared at a reduced aliquot; however, all MDC's were met. No further action is necessary.
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples C-JS-03-10-12, CS-JS-01-1-3, CS-JS-01-5-7, EM-H22-5-7, EM-K24-0-1, EM-K24-1-3, CS-JS-02-0-1, and CS-JS-02-5-7 did not meet these requirements and were flagged as TI by the laboratory and qualified as T4 (tentatively identified) during data validation. In some cases the sample density was less than or greater than the associated calibration standard density. The density of samples C-JS-03-5-7, C-JS-03-10-12, C-JS-03-15-17, CS-JS-01-1-3, CS-JS-01-5-7, CS-JS-01-10-12, CS-JS-02-0-1, CS-JS-03-1-3, and CS-JS-03-10-12 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

\leq - Less than or equal to

\pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS - Matrix Spike

N1 - See Case Narrative

QAPP - Quality Assurance Project Plan

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

QC - Quality Control

T4 - Tentatively Identified Compound

Table 1: Method Blank Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	Concentration (pCi/g)	Data Qualification
MB Batch AS090220-4	Uranium-234	0.053 ± 0.037	None. All associated uranium-234 and uranium-238 results were reported at concentrations $>10\times$ the blank contamination.
	Uranium-238	0.045 ± 0.033	

pCi/g - Picocuries per gram

B4 = Target analyte detected in the blank outside of the method acceptance criteria.

Table 2: Matrix Spike Outliers and Resultant Data Qualification

Radium-226 (Method 903.1)			
Sample	Analyte	%R (Limits)	Data Qualification
CS-JS-01-1-3	Radium-226	52.2 (57-126)	As the potential bias was considered to be low, the radium-226 result for sample CS-JS-01-1-3 was flagged as (M2).

%R – Percent Recovery

M2 – Matrix spike recovery was low; the associated blank spike recovery was acceptable.

MS – Matrix Spike

Bold indicates a recovery outside of acceptance limits.

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-212

Sampling Event: July 30th, August 1st, 4th, and 27th, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **No**

Data Reviewer: Katie Abbott

Date Completed: August 10, 2012

Peer Reviewer: Sheri Fling

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for seventeen soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses		
				Radium-226 Method 903.1	Isotopic Uranium	Gamma Spectroscopy
CS-JS-05-0-1	SA	0812212-1	Soil	---	X	X ²
CS-JS-05-1-3D	FD	0812212-2	Soil	X	X	X ¹
CS-JS-06-0-1	SA	0812212-3	Soil	---	X	X ²
EM-JS-02-0-1	SA	0812212-4	Soil	X	X	X ¹
EM-JS-01-0-1	SA	0812212-5	Soil	---	X	X ²
EM-JS-01-1-3	SA	0812212-6	Soil	X	X	X ¹
EM-M26-0-1	SA	0812212-7	Soil	X	X	X ¹
EM-M26-1-3	SA	0812212-8	Soil	X	X	X ¹
EM-M26-5-7	SA	0812212-9	Soil	---	X	X ²
C-JS-01-0-1	SA	0812212-10	Soil	X	X	X ¹
C-JS-01-1-3	SA	0812212-11	Soil	X	X	X ¹
C-JS-02-1-3	SA	0812212-12	Soil	---	X	---
C-JS-02-5-7	SA	0812212-13	Soil	X	X	X ¹
EM-H22-0-1	SA	0812212-14	Soil	---	X	X ²
EM-H22-1-3	SA	0812212-15	Soil	X	X	X ¹
C-JS-03-0-1	SA	0812212-16	Soil	X ^m	X	X ¹
C-JS-03-1-3	SA	0812212-17	Soil	X	X	X ¹
CS-JS-05-1-3*	SA	---	Soil	---	---	---
C-JS-02-0-1*	SA	---	Soil	---	---	---

Sample Type: SA = Sample FD = Field Duplicate

X¹ - Radium-228

X² - Radium-226 and Radium-228

X^m - Matrix spike

*-Samples received at laboratory broken and could not be analyzed

General Overall Assessment:

- _____ Data are usable without qualification.
- X Data are usable with qualification (noted below).
- _____ Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
Sample-specific Parameters	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	<p>Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP).</p> <p>It was noted on the sample receipt form that :</p> <ul style="list-style-type: none"> Samples CS-JS-05-1-3 and C-JS-02-0-1 were received at the laboratory broken; therefore, the analyses for are not performed. The container lid for sample CS-JS-05-1-3D was received broken. It was replaced at the laboratory upon arrival. The collection time listed on the container label did not match the collection time listed on the chain of custody (COC) for sample EM-M26-5-7. The sample was logged in per the COC.
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	Yes	Target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) C-JS-03-0-1 (Radium-226) Laboratory Duplicate (LD) EM-H22-0-1 (Gamma Spectroscopy) CS-JS-05-1-3D (Gamma Spectroscopy) CS-JS-06-0-1 (Isotopic Uranium) EM-JS-01-1-3 (Radium-226) 	No	<p>The recoveries for the MS analysis were within the laboratory-determined acceptance range.</p> <p>The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event.</p> <p>When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only.</p> <p>The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. With the exceptions summarized below in Table 1, the DER met the QC criterion.</p>
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	Yes	<p>Implied Detection Limits</p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p>Sample Specific Chemical Recoveries</p> <p>The sample specific recoveries were within the laboratory-determined acceptance limits for the applicable methods. Data qualification was not required.</p> <p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.</p>

Review Parameter	Criteria Met?	Comments
Field Quality Control <ul style="list-style-type: none"> Equipment Blank Field Duplicate None CS-JS-05-1-3/ CS-JS-05-1-3D	No	Equipment Blank An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed. Field Duplicate (FD) – Data Packages 08-12-212 (CS-JS-05-1-3D)/ 08-12-258 (CS-JS-05-1-3) The agreement between parent sample results and the field duplicate sample results was evaluated. With the exceptions listed in Table 1 below, the DER met the QC criterion of ≤ 2 .
MDCs Met?	No	For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary. All samples for isotopic uranium were prepared at a reduced aliquot; however, all MDC's were met. No further action is necessary.
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	Gamma Spectroscopy Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples CS-JS-05-0-1, CS-JS-06-0-1, EM-JS-02-0-1, EM-JS-01-1-3, EM-M26-0-1, EM-M26-5-7, C-JS-01-0-1, C-JS-01-1-3, EM-H22-1-3, C-JS-03-0-1, and C-JS-03-1-3 did not meet these requirements and was flagged as TI (tentatively identified) by the laboratory and qualified as T4 during data validation. In some cases the sample density is less than or greater than the associated calibration standard density. The density of samples CS-JS-05-1-3D, EM-JS-01-0-1, EM-M26-0-1, EM-M26-1-3, EM-M26-5-7, C-JS-01-0-1, C-JS-01-1-3, C-JS-02-1-3, C-JS-02-5-7, EM-H22-0-1, C-JS-03-0-1, and C-JS-03-1-3 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

 \leq - Less than or equal to \pm - Plus or Minus

DER – Duplicate Error Ratio

LCS/LCSD – Laboratory Control Sample/Laboratory Control Sample Duplicate

MS – Matrix Spike

N1 – See Case Narrative

QAPP – Quality Assurance Project Plan

RPD – Relative Percent Difference

TPU – Total Propagated Uncertainty

% - Percent

COC – Chain of Custody

ID – Identification

LD – Laboratory Duplicate

MDC – Minimum Detectable Concentration

N/A – Not Applicable

QC – Quality Control

T4 – Tentatively Identified Compound

Table 1: DER Outliers and Resultant Data Qualification

Sample	Analyte	DER	Data Qualification
Radium-226 (Method 903.1)			
EM-JS-01-1-3	Radium-226	1.3	The DERs between the parent sample and laboratory duplicate sample for radium-226 exceeded the criterion of ≤ 1.0 . Therefore, the associated analytical results were qualified as estimated N6.
Isotopic Uranium			
CS-JS-05-1-3/ CS-JS-05-1-3D	Uranium-234	3.4	The DERs between the parent sample and field duplicate sample for the listed analytes exceeded the criterion of ≤ 2.0 . Therefore, the associated analytical results were qualified as estimated N6.
	Uranium-235	2.1	
	Uranium-238	3.5	

DER – Duplicate Error Ratio

N6 – Data suspect due to quality control failure, data reported per data user's result.

SIERRITA DATA REVIEW SUMMARY

Data Package Number: 08-12-251

Sampling Event: July 23rd, 28th-29th, August 1st, September 19th, 24th-25th, October 3rd, 5th, 21st-25th, 2008

Sample-specific Parameter Review? **Yes**

Laboratory Performance Parameters? **No**

Data Reviewer: Katie Abbott

Date Completed: August 14, 2012

Peer Reviewer: Sheri Fling

Date Completed: August 17, 2012

This report summarizes the verification of analytical data for twenty-nine soil samples. ALS Laboratory Group of Fort Collins, Colorado performed the analyses.

The data review was conducted in accordance with the criteria specified in the Draft Addendum – Quality Assurance Project Plan (QAPP) Sierrita Mine Green Valley, Arizona (September 2008). Independent review flags were assigned as required by Appendix E in the QAPP. The table below summarizes the samples and analyses presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses			
				Radium-226 Method 903.1	Radium-228 By GFPC	Isotopic Uranium	Gamma Spectroscopy
ST-SB04 60-80	SA	082251-1	Soil	---	---	X	X ²
ST-SB01 180-200	SA	082251-2	Soil	---	---	X	X ²
ST-SB04 40-60	SA	082251-3	Soil	---	---	X	X ²
ST-SB01 100-120	SA	082251-4	Soil	X	---	X	X ¹
ST-SB01 120-140	SA	082251-5	Soil	X	---	X	X ¹
ST-SB01 80-100	SA	082251-6	Soil	X	---	X	X ¹
ST-SB01 160-180	SA	082251-7	Soil	X	---	X	X ¹
ST-SB04 0-20	SA	082251-8	Soil	---	---	X	X ²
ST-SB04 80-100	SA	082251-9	Soil	---	---	X	X ²
ST-SB03 200-210	SA	082251-10	Soil	X	---	X	X ¹
ST-SB04 20-40	SA	082251-11	Soil	X	---	X	X ¹
ST-SB06 180-200	SA	082251-12	Soil	X	---	X	X ¹
ST-SB06 200-220	SA	082251-13	Soil	---	---	X	X ²
ST-SB02 20-40	SA	082251-14	Soil	X	---	X	X ¹
ST-SB06 0-20	SA	082251-15	Soil	X	---	X	X ¹
ST-SB06 140-160	SA	082251-16	Soil	X	---	X	X ¹
ET-SB02 60-80	SA	082251-17	Soil	X	---	X	X ¹
ET-SB02 80-100	SA	082251-18	Soil	X	---	X	X ¹
ST-SB01 20-40	SA	082251-19	Soil	X	---	X	X ¹
ST-SB06 40-60	SA	082251-20	Soil	---	---	X	X ²
EM-JS-02-1-3	SA	082251-21	Soil	X	X	X	---
ST-SB01 60-80	SA	082251-22	Soil	X	---	X	X ¹
ST-SB06 240-260	SA	082251-23	Soil	X ^m	---	X	X ¹
OD-SD-05-1.5-3.0	SA	082251-24	Soil	X	---	X	X ¹
CP-Q09-0-1	SA	082251-25	Soil	X	---	X	X ¹
OD-JS-01-1-3	SA	082251-26	Soil	X	---	X	X ¹
OD-JS-02-5-7	SA	082251-27	Soil	X	---	X	X ¹
CP-SD-10-1.5-3.0	SA	082251-28	Soil	X	---	X	X ¹
EM-C22-1-3	SA	082251-29	Soil	X	---	X	X ¹

Sample Type: SA = Sample
 GFPC – Gas Flow Proportional Counting
 X¹– Radium-228
 X²– Radium-226 and Radium-228

General Overall Assessment:

_____	Data are usable without qualification.
<u> X </u>	Data are usable with qualification (noted below).
_____	Some or all data are unusable for any purpose (detailed below).

Case Narrative Summary: Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the table below.

Review Parameter	Criteria Met?	Comments
<i>Sample-specific Parameters</i>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	No	Samples were received intact and under custody. The cooler temperatures were ambient upon arrival at the laboratory per the quality assurance project plan (QAPP). It was noted on the sample receipt form that the container lids for samples ST-SB01 180-200 and ST-SB06 140-160 were received broken. They were replaced at the laboratory upon arrival.
Holding Times	Yes	All samples were analyzed within the method required holding time.
Method Blanks	No	With the exceptions listed in Table 1 below, target analytes were not reported as detected within the associated method blanks.
Matrix Quality Control <ul style="list-style-type: none"> Matrix Spike(MS) ST-SB06 240-260 (Ra-226) Laboratory Duplicate (LD) EM-C22-1-3 (Gamma Spectroscopy) ST-SB01 100-120 (Gamma Spectroscopy) OD-SD-05-1.5-3.0 (Gamma Spectroscopy) ST-SB04 40-60 (Isotopic Uranium) ST-SB06 180-200 (Isotopic Uranium) EM-JS-02-1-3 (Isotopic Uranium) OD-JS-01-1-3 (Isotopic Uranium) ST-SB01 80-100 (Ra-226) ET-SB02 60-80 (Ra-226) 	No	The recoveries for the MS analysis were within the laboratory-determined acceptance range. The frequency of MS samples submitted meet the QAPP required 1 per 20 samples submitted. However, based on limited volume and method limitations, an MS was only performed for radium-226 (method 903.1) samples collected in association with this event. When MS issues accounted for less than 35% of the MS analyses conducted, applicable data qualification was limited to qualification of the parent sample. When greater than 35% of the MS results did not met the criteria, qualification was extended to all associated samples. For this sample event, MS issues accounted for less than 35%; therefore, qualification was limited to parent results only. The agreement between parent sample results and the laboratory duplicate sample results was evaluated. The total propagated uncertainty (TPU) was used in the calculation instead of uncertainty as the laboratory reported the result as activity ± 2 TPU. With the exceptions summarized below in Table 2, the duplicate error ratio (DER) met the QC criterion.
Method Quality Control <ul style="list-style-type: none"> Implied Detection Limits Sample Specific Chemical Recovery (Chemical Yield) Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) 	No	Implied Detection Limits No values for radionuclides were reported as detected with associated uncertainties greater than the reported result. Sample Specific Chemical Recovery With the exception listed below, the sample specific recoveries were with the laboratory-determined acceptance limits for the applicable methods. <i>Isotopic Uranium</i> The tracer uranium-232 recovery for sample OD-JS-02-5-7 was below the acceptance limit with a recovery of 14.6%. Therefore, the isotopic uranium

Review Parameter	Criteria Met?	Comments
		<p>results for sample OD-JS-02-5-7 were flagged with N6.</p> <p>Laboratory Control Sample/ Laboratory Control Sample Duplicate</p> <p>The LCS/LCSD recoveries were within the laboratory acceptance limits. Data qualification was not required.</p>
Field Quality Control <ul style="list-style-type: none"> Equipment Blank None Field Duplicate None 	No	<p>Equipment Blank</p> <p>An equipment blank was not submitted for this sampling event. Therefore, decontamination procedures could not be assessed.</p> <p>Field Duplicate (FD)</p> <p>A field duplicate was not reported in this data package. The frequency of field duplicates did not meet the QAPP required 1 per 20 samples submitted.</p>
MDCs Met?	No	<p>For gamma spectroscopy analysis, some of the MDC were not met. However, all results were reported above the MDCs achieved. No further action is necessary.</p> <p>All samples for isotopic uranium were prepared at a reduced aliquot; therefore, some of the MDCs were not met. However, all detected results were reported above the MDCs achieved. No further action is necessary.</p>
Other Parameters <ul style="list-style-type: none"> Tentatively Identified Compounds (TICs) Case Narrative 	No	<p>Gamma Spectroscopy</p> <p>Activity concentrations above the calculated MDC are reported in some instances where the minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Radium-228 results for samples ST-SB04 60-80, ST-SB01 180-200, ST-SB04 40-60, ST-SB01 100-120, ST-SB01 80-100, ST-SB01 160-180, ST-SB04 0-20, ST-SB04 80-100, ST-SB03 200-210, ST-SB04 20-40, ST-SB06 180-200, ST-SB06 200-220, ST-SB02 20-40, ST-SB06 0-20, ST-SB06 140-160, ET-SB02 60-80, ET-SB02 80-100, ST-SB01 20-40, ST-SB06 40-60, and CP-SD-10-1.5-3.0 did not meet these requirements and were flagged TI by the laboratory and qualified as T4 (tentatively identified) during data validation.</p> <p>In some cases the sample density is less than or greater than the associated calibration standard density. The density of samples ST-SB04 60-80, ST-SB01 180-200, ST-SB04 40-60, ST-SB01 100-120, ST-SB01 120-140, ST-SB01 80-100, ST-SB01 160-180, ST-SB04 0-20, ST-SB04 80-100, ST-SB03 200-210, ST-SB04 20-40, ST-SB06 180-200, ST-SB06 200-220, ST-SB02 20-40, ST-SB06 0-20, ST-SB06 140-160, ET-SB02 80-100, ST-SB01 20-40, ST-SB06 40-60, ST-SB01 60-80, ST-SB06 240-260, OD-SD-05-1.5-3.0, CP-Q09-0-1, OD-JS-01-1-3, OD-JS-02-5-7, and EM-C22-1-3 exceeded the density of the calibration standard (limit of $\pm 15\%$) and were flagged by the laboratory as G and were qualified as N1 during data validation.</p>
Package Completeness	Yes	The results are usable as qualified for the project objective. The data are 100% complete.

\leq - Less than or equal to

\pm - Plus or Minus

DER - Duplicate Error Ratio

LCS/LCSD - Laboratory Control Sample/Laboratory Control Sample Duplicate

MS - Matrix Spike/ Matrix Spike Duplicate

N1 - See Case Narrative

N6 - Data suspect due to quality control failure, data reported per data user's result.

QC - Quality Control

T4 - Tentatively Identified Compound

% - Percent

COC - Chain of Custody

ID - Identification

LD - Laboratory Duplicate

MDC - Minimum Detectable Concentration

N/A - Not Applicable

QAPP - Quality Assurance Project Plan

RPD - Relative Percent Difference

TPU - Total Propagated Uncertainty

Table 1: Method Blank Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	Concentration (pCi/g)	Data Qualification
MB Batch AS090220-3	Uranium-234	0.076 ± 0.048	All associated isotopic uranium-234 and uranium-238 results reported as detected at concentrations <10x the blank contamination were flagged with a B4.
	Uranium-238	0.057 ± 0.039	
MB Batch AS090223-1	Uranium-234	0.0067 ± 0.0083	None. All associated uranium-234 results were reported at concentrations >10x the blank contamination.

pCi/g – Picocuries per gram

B4 = Target analyte detected in the blank outside of the method acceptance criteria.

Table 2: DER Outliers and Resultant Data Qualification

Isotopic Uranium			
Sample	Analyte	DER	Data Qualification
ST-SB04 40-60	Uranium-234	1.4	The DERs between the parent sample and laboratory duplicate sample for uranium-234 and uranium-238 exceeded the criterion of ≤ 1.0 . Therefore, the associated analytical results were qualified as estimated N6.
	Uranium-238	1.1	

DER – Duplicate Error Ratio

N6 – Data suspect due to quality control failure, data reported per data user's result.

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: E-JS-01-5-7
Lab ID: 0812175-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.61	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EV-JS-01-0-1
Lab ID: 0812175-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.44 +/- 0.23	0.17	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

KA 8/8/2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-1-3

Lab ID: 0812175-11

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 14-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Allquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.85	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is In control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

KA 8/8/12

Date Printed: Friday, March 06, 2009

ALS Paragon

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-02-0-1
Lab ID: 0812175-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.80	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

VA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-N08-1-3
Lab ID: 0812175-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.1 +/- 0.94	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-N08-5-7

Lab ID: 0812175-20

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 11-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: RE090203-3

QCBatchID: RE090203-3-1

Run ID: RE090203-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.59	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

CA-8/9/12

Date Printed: Friday, March 06, 2009

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-0-1

Lab ID: 0812175-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 94.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090056d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.61	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

CA 8/8/12

Date Printed: Thursday, January 29, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-1-3

Lab ID: 0812175-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 100 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090057d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.64	0.89	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

CA 8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-5-7	Sample Matrix: SOIL	Prep Batch: GS090106-2	Final Aliquot: 120 g
Lab ID: 0812175-3	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-2-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 14-Jul-08	Run ID: GS090106-2A	Moisture(%): NA
	Date Prepared: 24-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 13-Jan-09	Report Basis: Dry Weight	File Name: 090025d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.52	0.74	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

KA 8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-5-5.4

Lab ID: 0812175-4

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 185 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090067d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.0 +/- 0.61	0.57	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide Identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

KA 8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-S-5.4

Lab ID: 0812175-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 185 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090067d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.72	1.1	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-02-0-1

Lab ID: 0812175-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 99.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090061d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.71	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

KA-8/1/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-02-1-3

Lab ID: 0812175-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 104 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090068d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.63	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

KA 8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-0-1

Lab ID: 0812175-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 98.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090058d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.50	0.88	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

KA 8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-5-7

Lab ID: 0812175-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 80.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090026d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.66	1.2	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Date Printed: Thursday, January 29, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-0-1

Lab ID: 0812175-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090083d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.59	0.88	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Date Printed: Thursday, January 29, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-1-2.5

Lab ID: 0812175-12

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 194 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.42	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide Identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812175-1

VA-8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-1-2.5

Lab ID: 0812175-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 194 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.60	1.1	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Date Printed: Thursday, January 29, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-003-0-1

Lab ID: 0812175-13

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090035d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.38	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Date Printed: Thursday, January 29, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-003-0-1

Lab ID: 0812175-13

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090035d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.52	0.90	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Date Printed: Thursday, January 29, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-003-1-3

Lab ID: 0812175-14

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 233 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090071d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.3 +/- 0.52	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

10A-8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-003-1-3

Lab ID: 0812175-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 233 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090071d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.61	0.83	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

KA 8/12

Date Printed: Thursday, January 29, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M06-0-1

Lab ID: 0812175-15

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 173 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090068d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.29	0.47	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M06-0-1

Lab ID: 0812175-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 173 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090068d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.45	0.90	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M06-1-3
Lab ID: 0812175-16

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 195 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.0 +/- 0.28	0.52	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-M06-1-3
Lab ID: 0812175-16

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2
QCBatchID: GS090109-2-1
Run ID: GS090109-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 195 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090079d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.64	1.2	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-02-0-1
Lab ID:	0812175-17

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090069d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.85	1.6	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-N08-0-1
Lab ID: 0812175-18

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 194 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090036d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.31	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

Date Printed: Thursday, January 29, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-N08-0-1

Lab ID: 0812175-18

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090109-2

QCBatchID: GS090109-2-1

Run ID: GS090109-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 194 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090036d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.47	0.72	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-N08-1-3	Sample Matrix: SOIL	Prep Batch: GS090106-2	Final Allquot: 88.5 g
Lab ID: 0812175-19	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-2-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 11-Jul-08	Run ID: GS090106-2A	Moisture(%): NA
	Date Prepared: 24-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 13-Jan-09	Report Basis: Dry Weight	File Name: 090059d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.0 +/- 0.80	0.96	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-N08-5-7

Lab ID: 0812175-20

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-2

QCBatchID: GS090106-2-1

Run ID: GS090106-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 99.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090084d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.78	1.2	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812175-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-03-0-1
Lab ID:	0812175-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.49	0.036	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.048	0.1	
7440-61-1	U-238	2.7 +/- 0.50	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.79	pCi/g	84.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-1-3
Lab ID: 0812175-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.42	0.027	0.1	
15117-96-1	U-235	0.072 +/- 0.044	0.032	0.1	LT
7440-61-1	U-238	2.2 +/- 0.42	0.033	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.510	4.17	pCi/g	92.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-03-5-7

Lab ID: 0812175-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.6 +/- 0.65	0.030	0.1	
15117-96-1	U-235	0.20 +/- 0.081	0.042	0.1	
7440-61-1	U-238	3.6 +/- 0.64	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.491	3.77	pCi/g	84.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-5-5.4

Lab ID: 0812175-4

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.8 +/- 0.68	0.034	0.1	
15117-96-1	U-235	0.20 +/- 0.079	0.017	0.1	
7440-61-1	U-238	3.8 +/- 0.68	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.499	3.84	pCi/g	85.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Date Printed: Thursday, January 29, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-02-0-1

Lab ID: 0812175-5

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.41	0.029	0.1	
15117-96-1	U-235	0.12 +/- 0.061	0.018	0.1	
7440-61-1	U-238	2.3 +/- 0.44	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.513	3.88	pCi/g	86.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-02-1-3

Lab ID: 0812175-6

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.6 +/- 0.83	0.046	0.1	
15117-96-1	U-235	0.31 +/- 0.10	0.019	0.1	
7440-61-1	U-238	4.9 +/- 0.87	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.66	pCi/g	81.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

KA 8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-0-1

Lab ID: 0812175-7

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.060	0.1	
15117-96-1	U-235	0.097 +/- 0.055	0.051	0.1	LT
7440-61-1	U-238	1.6 +/- 0.33	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.500	3.92	pCi/g	87.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

KA 8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-1-3

Lab ID: 0812175-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.088	0.1	
15117-96-1	U-235	0.092 +/- 0.062	0.074	0.1	LT
7440-61-1	U-238	2.5 +/- 0.48	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	3.17	pCi/g	70.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

KA-8/8/12

Date Printed: Thursday, January 29, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-5-7

Lab ID: 0812175-9

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.47	0.090	0.1	
15117-96-1	U-235	0.072 +/- 0.055	0.063	0.1	LT
7440-61-1	U-238	2.5 +/- 0.51	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	3.04	pCi/g	67.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Date Printed: Thursday, January 29, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-0-1

Lab ID: 0812175-10

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.8 +/- 0.68	0.051	0.1	
15117-96-1	U-235	0.27 +/- 0.098	0.019	0.1	
7440-61-1	U-238	4.0 +/- 0.72	0.051	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.502	3.81	pCi/g	84.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

KA-8/8/12

Date Printed: Thursday, January 29, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-1-3

Lab ID: 0812175-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.46	0.048	0.1	
15117-96-1	U-235	0.13 +/- 0.063	0.035	0.1	
7440-61-1	U-238	2.6 +/- 0.48	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.506	4.23	pCi/g	94.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M04-1-2.5

Lab ID: 0812175-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.067	0.1	
15117-96-1	U-235	0.069 +/- 0.047	0.049	0.1	LT
7440-61-1	U-238	1.8 +/- 0.35	0.055	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.92	pCi/g	87.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-003-0-1

Lab ID: 0812175-13

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.49	0.072	0.1	
15117-96-1	U-235	0.14 +/- 0.069	0.043	0.1	
7440-61-1	U-238	2.7 +/- 0.52	0.075	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.56	pCi/g	79.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Date Printed: Thursday, January 29, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-003-1-3

Lab ID: 0812175-14

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.1 +/- 0.56	0.072	0.1	
15117-96-1	U-235	0.23 +/- 0.085	0.044	0.1	
7440-61-1	U-238	3.1 +/- 0.56	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.484	4.02	pCi/g	89.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

KA-8/8/12

Date Printed: Thursday, January 29, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M06-0-1	Sample Matrix: SOIL	Prep Batch: AS090114-1	Final Allquot: 1.01 g
Lab ID: 0812175-15	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090114-1-1	Prep Basis: Dry Weight
	Date Collected: 11-Jul-08	Run ID: AS090114-1A	Moisture(%): NA
	Date Prepared: 14-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.1 +/- 0.24	0.065	0.1	
15117-96-1	U-235	0.063 +/- 0.046	0.056	0.1	LT
7440-61-1	U-238	1.1 +/- 0.23	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.98	pCi/g	88.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Date Printed: Thursday, January 29, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-M06-1-3

Lab ID: 0812175-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.88 +/- 0.20	0.034	0.1	
15117-96-1	U-235	0.056 +/- 0.040	0.034	0.1	LT
7440-61-1	U-238	1.0 +/- 0.22	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.502	4.28	pCi/g	95.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Date Printed: Thursday, January 29, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-02-0-1

Lab ID: 0812175-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	12 +/- 2.0	0.017	0.1	
15117-96-1	U-235	0.74 +/- 0.19	0.046	0.1	
7440-61-1	U-238	12 +/- 2.0	0.017	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.518	3.78	pCi/g	83.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

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Date Printed: Thursday, January 29, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-N08-0-1
Lab ID:	0812175-18

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.043	0.1	
15117-96-1	U-235	0.089 +/- 0.053	0.037	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.518	3.97	pCi/g	88.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

1CA 8/8/12

Date Printed: Thursday, January 29, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-N08-1-3

Lab ID: 0812175-19

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 14-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1

QCBatchID: AS090114-1-1

Run ID: AS090114-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.9 +/- 0.70	0.050	0.1	
15117-96-1	U-235	0.20 +/- 0.082	0.036	0.1	
7440-61-1	U-238	4.0 +/- 0.71	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.509	3.90	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

Date Printed: Thursday, January 29, 2009

ALS Paragon

LIMS Version: 6.238A

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KA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-N08-5-7
Lab ID:	0812175-20

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 14-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: AS090114-1
QCBatchID: AS090114-1-1
Run ID: AS090114-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.0 +/- 0.72	0.058	0.1	
15117-96-1	U-235	0.18 +/- 0.079	0.038	0.1	
7440-61-1	U-238	4.3 +/- 0.78	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.489	3.68	pCi/g	81.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812175-1

KA-8/8/12

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: E-JS-01-1-3

Lab ID: 0812175-8

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 14-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.504 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 1.7	2.5	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	31600	ug	89.8	40 - 110 %	
YTTRIUM	8713	6210	ug	71.3	40 - 110 %	
Total				64.0	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812175-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812175

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-1-3

Lab ID: 0812175-11

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 14-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Allquot: 0.507 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.8 +/- 1.7	2.5	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	31900	ug	90.6	40 - 110 %	
YTTRIUM	8713	5840	ug	67.0	40 - 110 %	
Total				60.8	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812175-1

KA 3/8/12

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-03-0-1
Lab ID: 0812175-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.66	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

10A-8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-03-1-3
Lab ID: 0812175-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.60	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

KA-8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-03-5-7
Lab ID: 0812175-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.3 +/- 1.2	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: E-JS-02-0-1
Lab ID: 0812175-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.52	0.063	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

KN 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: E-JS-02-1-3	Sample Matrix: SOIL	Prep Batch: RE090203-3	Final Aliquot: 1.04 g
Lab ID: 0812175-6	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-3-1	Prep Basis: Dry Weight
	Date Collected: 14-Jul-08	Run ID: RE090203-3A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.8 +/- 1.1	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812175-1

KA-8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: E-JS-01-0-1
Lab ID: 0812175-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: RE090203-3
QCBatchID: RE090203-3-1
Run ID: RE090203-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.44	0.24	1	M1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

KA 8/8/12

Date Printed: Friday, March 06, 2009

ALS Paragon
LIMS Version: 6.249A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812175
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: E-JS-01-1-3	Sample Matrix: SOIL	Prep Batch: RE090203-3	Final Aliquot: 1.03 g
Lab ID: 0812175-8	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-3-1	Prep Basis: Dry Weight
	Date Collected: 14-Jul-08	Run ID: RE090203-3A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 27-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.54	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812175-1

ICA 8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5

Lab ID: 0812177-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 96.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090017d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.50	0.96	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0	Sample Matrix: SOIL	Prep Batch: GS090109-3	Final Aliquot: 202 g
Lab ID: 0812177-2	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-3-1	Prep Basis: Dry Weight
Library: Ra-226	Date Collected: 16-Jul-08	Run ID: GS090109-3A	Moisture(%): NA
	Date Prepared: 24-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 15-Jan-09	Report Basis: Dry Weight	File Name: 090077d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.39	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090077d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.57	0.78	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-0-1.5

Lab ID: 0812177-3

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 188 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.34	0.54	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA-8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-0-1.5
Lab ID: 0812177-3

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 16-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090088d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.58	1.0	1	M3, TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812177-1

VA 8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon
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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-1.5-3.0

Lab ID: 0812177-4

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090054d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.66	0.95	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide Identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-06-0-1.5
Lab ID:	0812177-5

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.44	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Date Printed: Thursday, February 05, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-0-1.5

Lab ID: 0812177-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.59	0.91	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Date Printed: Thursday, February 05, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-1.5-3.0

Lab ID: 0812177-6

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 208 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.49	0.51	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Date Printed: Thursday, February 05, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-1.5-3.0

Lab ID: 0812177-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 208 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.65	0.92	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-0-1.5

Lab ID: 0812177-7

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 186 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.46	0.54	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-0-1.5

Lab ID: 0812177-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 186 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.56	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-1.5-3.0

Lab ID: 0812177-8

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 109 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090060d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.62	0.96	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-0-1.5

Lab ID: 0812177-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 104 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090061d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.61	1.0	1	M3, TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-1.5-3.0

Lab ID: 0812177-10

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090090d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.42	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide Identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-1.5-3.0

Lab ID: 0812177-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090090d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.59	0.78	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-1-3

Lab ID: 0812177-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.8 +/- 0.78	1.3	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Date Printed: Thursday, February 05, 2009

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-0-1

Lab ID: 0812177-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090018d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.8 +/- 0.69	0.90	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Date Printed: Thursday, February 05, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-0-1.5

Lab ID: 0812177-14

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 85.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090055d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.81	1.6	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide Identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA-8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-1.5-3.0

Lab ID: 0812177-15

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 84.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090062d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.84	1.5	1	M3,G,TI TH,NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-Q09-1-3

Lab ID: 0812177-16

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090046d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.35	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA-8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-Q09-1-3

Lab ID: 0812177-16

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090046d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.54	0.69	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

VA 8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5

Lab ID: 0812177-17

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 88.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090080d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.59	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

KA 8/8/12

Date Printed: Thursday, February 05, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CD-SD-09-1.5-3.0

Lab ID: 0812177-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 109 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090019d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.45	0.79	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Date Printed: Thursday, February 05, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3

Lab ID: 0812177-19

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090056d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.0	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

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Date Printed: Thursday, February 05, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5

Lab ID: 0812177-20

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 101 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090023d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.62	0.85	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5

Lab ID: 0812177-1

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.031	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.036	0.1	
7440-61-1	U-238	1.5 +/- 0.31	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.418	3.58	pCi/g	81.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Date Printed: Monday, February 16, 2009

ALS Paragon

LIMS Version: 6.245A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-01-1.5-3.0
Lab ID:	0812177-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.030	0.1	
15117-96-1	U-235	0.14 +/- 0.067	0.042	0.1	
7440-61-1	U-238	2.2 +/- 0.42	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.447	3.63	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-0-1.5

Lab ID: 0812177-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.014	0.1	
15117-96-1	U-235	0.092 +/- 0.051	0.033	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.461	4.09	pCi/g	91.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-1.5-3.0

Lab ID: 0812177-4

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.27	0.046	0.1	
15117-96-1	U-235	0.043 +/- 0.039	0.023	0.1	LT
7440-61-1	U-238	1.2 +/- 0.27	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	2.81	pCi/g	62.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA-8/8/12

Date Printed: Monday, February 16, 2009

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LIMS Version: 6.245A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-0-1.5

Lab ID: 0812177-5

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.037	0.1	
15117-96-1	U-235	0.095 +/- 0.052	0.039	0.1	LT
7440-61-1	U-238	1.9 +/- 0.37	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.448	4.03	pCi/g	90.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-1.5-3.0

Lab ID: 0812177-6

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.034	0.1	
15117-96-1	U-235	0.11 +/- 0.056	0.034	0.1	
7440-61-1	U-238	1.9 +/- 0.36	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	4.04	pCi/g	89.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

LA 8/8/12

Date Printed: Monday, February 16, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-0-1.5

Lab ID: 0812177-7

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.40	0.050	0.1	
15117-96-1	U-235	0.15 +/- 0.068	0.035	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.466	3.80	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA-8/8/12

Date Printed: Monday, February 16, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-1.5-3.0

Lab ID: 0812177-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 0.507 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.49	0.10	0.1	
15117-96-1	U-235	0.098 +/- 0.076	0.038	0.1	LT
7440-61-1	U-238	1.9 +/- 0.44	0.11	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.913	7.30	pCi/g	82.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is In control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-03-0-1.5
Lab ID:	0812177-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.98 +/- 0.23	0.049	0.1	
15117-96-1	U-235	0.075 +/- 0.051	0.053	0.1	LT
7440-61-1	U-238	1.1 +/- 0.25	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.65	pCi/g	81.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-1.5-3.0

Lab ID: 0812177-10

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 0.514 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.42	0.13	0.1	M3
15117-96-1	U-235	0.097 +/- 0.080	0.097	0.1	U
7440-61-1	U-238	1.9 +/- 0.42	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.793	7.60	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

CA 8/8/12

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P07-1-3
Lab ID:	0812177-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.501 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.52	0.10	0.1	M3
15117-96-1	U-235	0.19 +/- 0.11	0.040	0.1	
7440-61-1	U-238	2.6 +/- 0.56	0.089	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.016	7.69	pCi/g	85.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P07-0-1
Lab ID: 0812177-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.508 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.49	0.11	0.1	M3
15117-96-1	U-235	0.21 +/- 0.12	0.040	0.1	
7440-61-1	U-238	2.9 +/- 0.62	0.079	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.902	7.19	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

VA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-5-7

Lab ID: 0812177-13

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 10-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 1000 minutes

Report Basis: Dry Weight

Final Aliquot: 0.262 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.36	0.10	0.1	M3
15117-96-1	U-235	0.074 +/- 0.068	0.098	0.1	U
7440-61-1	U-238	1.8 +/- 0.35	0.11	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	17.26	14.7	pCi/g	84.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-0-1.5

Lab ID: 0812177-14

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 09-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 0.500 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.42	0.059	0.1	
15117-96-1	U-235	0.097 +/- 0.075	0.069	0.1	LT
7440-61-1	U-238	2.1 +/- 0.46	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.034	7.72	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-1.5-3.0

Lab ID: 0812177-15

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.031	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.036	0.1	
7440-61-1	U-238	1.3 +/- 0.27	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.455	3.57	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-Q09-1-3

Lab ID: 0812177-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.26	0.036	0.1	
15117-96-1	U-235	0.020 +/- 0.025	0.018	0.1	LT
7440-61-1	U-238	1.2 +/- 0.25	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.505	3.63	pCi/g	80.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

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Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11
Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5

Lab ID: 0812177-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.40	0.041	0.1	
15117-96-1	U-235	0.098 +/- 0.055	0.043	0.1	LT
7440-61-1	U-238	2.4 +/- 0.46	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.480	3.72	pCi/g	83.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Date Printed: Monday, February 16, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CD-SD-09-1.5-3.0

Lab ID: 0812177-18

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.051	0.1	
15117-96-1	U-235	0.072 +/- 0.046	0.035	0.1	LT
7440-61-1	U-238	1.7 +/- 0.34	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.388	3.63	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3

Lab ID: 0812177-19

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.91 +/- 0.21	0.049	0.1	
15117-96-1	U-235	0.041 +/- 0.034	0.019	0.1	LT
7440-61-1	U-238	0.84 +/- 0.20	0.055	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.446	3.70	pCi/g	83.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/12

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ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5

Lab ID: 0812177-20

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 10-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 1000 minutes

Report Basis: Dry Weight

Final Aliquot: 0.252 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.16	0.1	M3
15117-96-1	U-235	0.060 +/- 0.058	0.080	0.1	U
7440-61-1	U-238	1.9 +/- 0.38	0.10	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	17.95	14.4	pCi/g	80.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

KA 8/8/09

Date Printed: Monday, February 16, 2009

ALS Paragon

LIMS Version: 6.245A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5
Lab ID: 0812177-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 16-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.61	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-1.5-3.0

Lab ID: 0812177-4

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 16-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.47	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA 8/8/12

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-05-1.5-3.0
Lab ID: 0812177-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 16-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.61	0.060	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-03-0-1.5
Lab ID: 0812177-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 16-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.79	0.094	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P07-1-3
Lab ID: 0812177-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.8 +/- 1.2	0.71	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-0-1
Lab ID: 0812177-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.69	0.30	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

CA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P07-5-7
Lab ID: 0812177-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.44	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

KH 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-0-1.5
Lab ID: 0812177-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.77 +/- 0.31	0.065	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

CA 8/8/12

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-1.5-3.0

Lab ID: 0812177-15

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 17-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.49	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA-8/8/12

Date Printed: Saturday, March 14, 2009

ALS Paragon

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5
Lab ID: 0812177-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.76	0.26	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CD-SD-09-1.5-3.0	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-18	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.55	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P12-1-3
Lab ID:	0812177-19

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 23-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.65	0.58	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

CA 8/8/12

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5
Lab ID: 0812177-20

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.61	0.58	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

KA 8/8/12

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-5-7

Lab ID: 0812177-13

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 17-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Allquot: 0.508 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 1.8	2.8	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	32900	ug	93.4	40 - 110 %	
YTTRIUM	8713	5480	ug	62.9	40 - 110 %	
Total				58.7	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812177-1

RA 8/8/12

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-02-1-3	Sample Matrix: SOIL	Prep Batch: GS090109-3	Final Aliquot: 175 g
Lab ID: 0812178-1	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-3-1	Prep Basis: Dry Weight
Library: Ra-226	Date Collected: 11-Jul-08	Run ID: GS090109-3A	Moisture(%): NA
	Date Prepared: 24-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 15-Jan-09	Report Basis: Dry Weight	File Name: 090080d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.28	0.42	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-02-1-3	Sample Matrix: SOIL	Prep Batch: GS090109-3	Final Aliquot: 175 g
Lab ID: 0812178-1	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 11-Jul-08	Run ID: GS090109-3A	Moisture(%): NA
	Date Prepared: 24-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 15-Jan-09	Report Basis: Dry Weight	File Name: 090080d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.63	1.1	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-009-1-3
Lab ID:	0812178-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 91.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090059d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.64	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-5-7

Lab ID: 0812178-4

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 95.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090050d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.77	1.4	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-10-12

Lab ID: 0812178-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 102 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090065d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.1	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-15-17	Sample Matrix: SOIL	Prep Batch: GS090106-4	Final Aliquot: 94.9 g
Lab ID: 0812178-6	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-4-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 11-Jul-08	Run ID: GS090106-4A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 13-Jan-09	Report Basis: Dry Weight	File Name: 090073d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.74	1.1	1	M3, TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

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ALS Paragon

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-01-1-3	Sample Matrix: SOIL	Prep Batch: GS090106-4	Final Aliquot: 101 g
Lab ID: 0812178-8	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-4-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 15-Jul-08	Run ID: GS090106-4A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 13-Jan-09	Report Basis: Dry Weight	File Name: 090087d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.64	0.98	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-01-5-7
Lab ID: 0812178-9

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 15-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 203 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090091d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.49	0.60	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-5-7

Lab ID: 0812178-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090091d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.57	0.77	1	TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P04-0-1
Lab ID: 0812178-10

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 15-Jul-08
Date Prepared: 30-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4
QCBatchID: GS090106-4-1
Run ID: GS090106-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Allquot: 88.5 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090064d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.70	0.88	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P04-1-3

Lab ID: 0812178-11

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 200 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090047d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.35	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P04-1-3

Lab ID: 0812178-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 200 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090047d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.57	0.91	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P05-0-1

Lab ID: 0812178-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 111 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090075d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.63	0.94	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P05-1-3
Lab ID:	0812178-13

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 199 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090081d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.39	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P05-1-3
Lab ID: 0812178-13

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 15-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090081d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.52	0.72	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

KA 8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-10-12

Lab ID: 0812178-14

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 15-Jul-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 98.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090066d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.68	0.96	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

ICA 8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EV-JS-01-5-7
Lab ID: 0812178-15

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 14-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 188 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090092d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.2 +/- 0.76	0.64	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

KA-8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-5-7

Lab ID: 0812178-15

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 188 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.69	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

KA 8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EV-JS-02-1-3
Lab ID: 0812178-16

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 14-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 193 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090048d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.43	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

KA 8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EV-JS-02-1-3
Lab ID: 0812178-16

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 14-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 193 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090048d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.51	0.77	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812178-1

1CA 8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EV-JS-02-0-1
Lab ID: 0812178-17

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 14-Jul-08
Date Prepared: 30-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4
QCBatchID: GS090106-4-1
Run ID: GS090106-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 92.6 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090063d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.56	0.84	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

CA 8/2/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EV-JS-02-5-7
Lab ID: 0812178-18

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 14-Jul-08
Date Prepared: 24-Dec-08
Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3
QCBatchID: GS090109-3-1
Run ID: GS090109-3A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Allquot: 171 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090096d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.48	0.59	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812178-1

KA 8/8/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-5-7
Lab ID: 0812178-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 14-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 171 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090096d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.58	0.95	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812178-1

KA-8/8/12

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-02-1-3
Lab ID: 0812178-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.84 +/- 0.19	0.034	0.1	BH
15117-96-1	U-235	0.081 +/- 0.048	0.033	0.1	LT
7440-61-1	U-238	1.0 +/- 0.22	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.405	3.87	pCi/g	87.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

KA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-0-1

Lab ID: 0812178-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.51	0.054	0.1	
15117-96-1	U-235	0.21 +/- 0.086	0.038	0.1	
7440-61-1	U-238	2.8 +/- 0.53	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.57	pCi/g	79.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Date Printed: Monday, February 16, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-1-3

Lab ID: 0812178-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.051	0.1	
15117-96-1	U-235	0.17 +/- 0.075	0.019	0.1	NG
7440-61-1	U-238	2.0 +/- 0.40	0.057	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.368	3.44	pCi/g	78.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

KA 8/8/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-1-3

Lab ID: 0812178-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.044	0.1	
15117-96-1	U-235	0.073 +/- 0.048	0.047	0.1	LT
7440-61-1	U-238	2.1 +/- 0.40	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.351	3.85	pCi/g	88.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

KA 8/8/12

Date Printed: Monday, February 16, 2009

ALS Paragon

LIMS Version: 6.245A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-5-7

Lab ID: 0812178-4

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.066	0.1	
15117-96-1	U-235	0.16 +/- 0.074	0.044	0.1	
7440-61-1	U-238	1.9 +/- 0.37	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.472	3.83	pCi/g	85.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-10-12

Lab ID: 0812178-5

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.37	0.050	0.1	
15117-96-1	U-235	0.10 +/- 0.057	0.019	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.99	pCi/g	89.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-15-17

Lab ID: 0812178-6

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.50	0.058	0.1	
15117-96-1	U-235	0.13 +/- 0.065	0.020	0.1	
7440-61-1	U-238	2.6 +/- 0.49	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.360	3.54	pCi/g	81.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-01-0-1
Lab ID:	0812178-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 15-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.27	0.034	0.1	
15117-96-1	U-235	0.039 +/- 0.039	0.055	0.1	U
7440-61-1	U-238	1.3 +/- 0.28	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	3.56	pCi/g	79.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-1-3

Lab ID: 0812178-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 15-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.47	0.073	0.1	
15117-96-1	U-235	0.19 +/- 0.084	0.053	0.1	
7440-61-1	U-238	2.7 +/- 0.52	0.060	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.363	3.26	pCi/g	74.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-5-7

Lab ID: 0812178-9

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 15-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.043	0.1	
15117-96-1	U-235	0.20 +/- 0.079	0.034	0.1	
7440-61-1	U-238	2.1 +/- 0.40	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.331	3.80	pCi/g	87.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P04-0-1
Lab ID:	0812178-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 15-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.48	0.016	0.1	
15117-96-1	U-235	0.17 +/- 0.075	0.019	0.1	
7440-61-1	U-238	2.5 +/- 0.47	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.419	3.45	pCi/g	78.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P04-1-3

Lab ID: 0812178-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 15-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.45	0.055	0.1	
15117-96-1	U-235	0.19 +/- 0.084	0.049	0.1	
7440-61-1	U-238	1.9 +/- 0.39	0.062	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.439	3.41	pCi/g	76.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P05-0-1	Sample Matrix: SOIL	Prep Batch: AS090130-1	Final Aliquot: 1.04 g
Lab ID: 0812178-12	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090130-1-1	Prep Basis: Dry Weight
	Date Collected: 15-Jul-08	Run ID: AS090130-1A	Moisture(%): NA
	Date Prepared: 30-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 05-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.54	0.038	0.1	
15117-96-1	U-235	0.27 +/- 0.10	0.045	0.1	
7440-61-1	U-238	3.0 +/- 0.57	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.344	3.36	pCi/g	77.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P05-1-3
Lab ID:	0812178-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 15-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.47	0.045	0.1	
15117-96-1	U-235	0.22 +/- 0.085	0.036	0.1	
7440-61-1	U-238	2.6 +/- 0.48	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.63	pCi/g	80.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-10-12	Sample Matrix: SOIL	Prep Batch: AS090130-1	Final Allquot: 1.02 g
Lab ID: 0812178-14	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090130-1-1	Prep Basis: Dry Weight
	Date Collected: 15-Jul-08	Run ID: AS090130-1A	Moisture(%): NA
	Date Prepared: 30-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 05-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.52	0.047	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.047	0.1	
7440-61-1	U-238	3.0 +/- 0.55	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.444	3.92	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-01-5-7

Lab ID: 0812178-15

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 0.531 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	6.1 +/- 1.1	0.031	0.1	
15117-96-1	U-235	0.40 +/- 0.16	0.036	0.1	
7440-61-1	U-238	6.6 +/- 1.2	0.071	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.516	7.26	pCi/g	85.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-1-3

Lab ID: 0812178-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.51	0.047	0.1	
15117-96-1	U-235	0.21 +/- 0.087	0.041	0.1	
7440-61-1	U-238	2.6 +/- 0.50	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.511	3.54	pCi/g	78.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-1-3

Lab ID: 0812178-16DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.45	0.037	0.1	
15117-96-1	U-235	0.14 +/- 0.067	0.019	0.1	
7440-61-1	U-238	2.7 +/- 0.50	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.436	3.91	pCi/g	88.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EV-JS-02-0-1

Lab ID: 0812178-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 14-Jul-08

Date Prepared: 30-Jan-09

Date Analyzed: 05-Feb-09

Prep Batch: AS090130-1

QCBatchID: AS090130-1-1

Run ID: AS090130-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.037	0.1	
15117-96-1	U-235	0.15 +/- 0.070	0.044	0.1	
7440-61-1	U-238	2.0 +/- 0.40	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.437	3.73	pCi/g	84.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

KA-8/8/12

Date Printed: Monday, February 16, 2009

ALS Paragon

LIMS Version: 6.245A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EV-JS-02-5-7
Lab ID:	0812178-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 14-Jul-08
Date Prepared: 30-Jan-09
Date Analyzed: 09-Feb-09

Prep Batch: AS090130-1
QCBatchID: AS090130-1-1
Run ID: AS090130-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.016	0.1	
15117-96-1	U-235	0.069 +/- 0.047	0.038	0.1	LT
7440-61-1	U-238	2.3 +/- 0.45	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.461	3.57	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812178-1

CA 8/8/12

Date Printed: Monday, February 16, 2009

ALS Paragon

LIMS Version: 6.245A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-009-0-1	Sample Matrix: SOIL	Prep Batch: RE090220-1	Final Allquot: 1.04 g
Lab ID: 0812178-2	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-1-1	Prep Basis: Dry Weight
	Date Collected: 11-Jul-08	Run ID: RE090220-1A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 11-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.42	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

KCA-8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-O09-1-3
Lab ID: 0812178-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.44	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

1CA 8/2/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-009-5-7
Lab ID:	0812178-4

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 11-Jul-08

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.54	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812178-1

KA 8/8/12

Date Printed: Saturday, March 14, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-009-10-12

Lab ID: 0812178-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.10 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.40 +/- 0.30	0.43	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812178-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-15-17

Lab ID: 0812178-6

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 11-Jul-08

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.08 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.60	0.51	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812178-1

KA-8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-01-0-1
Lab ID: 0812178-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.64 +/- 0.44	0.59	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

KA-8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-01-1-3
Lab ID: 0812178-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.54	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P04-0-1
Lab ID: 0812178-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.58	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

KA 8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P05-0-1
Lab ID: 0812178-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.38	0.28	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

KA-8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-01-10-12
Lab ID: 0812178-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 15-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.71	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

KA-8/8/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812178
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EV-JS-02-0-1
Lab ID: 0812178-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 14-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.43 +/- 0.30	0.35	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812178-1

CA 8/8/12

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-009-0-1

Lab ID: 0812178-2

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 11-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.505 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	7.6 +/- 2.9	3.4	5	NC

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	31600	ug	89.8	40 - 110 %	
YTTRIUM	8713	4790	ug	55.0	40 - 110 %	
Total				49.4	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812178-1

ICA 8/8/12

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812178

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-01-0-1

Lab ID: 0812178-7

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 15-Jul-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Allquot: 0.507 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.2 +/- 1.9	2.7	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36280	31800	ug	87.6	40 - 110 %	
YTTRIUM	8713	5070	ug	58.2	40 - 110 %	
Total				51.0	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812178-1

KA-8/8/17

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-04-0-1

Lab ID: 0812207-1

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 183 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090107d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.47	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/9/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-04-0-1
Lab ID:	0812207-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 183 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090107d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.64	0.97	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-04-1-2.5
Lab ID:	0812207-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 97.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090074d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.67	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Date Printed: Saturday, February 14, 2009

ALS Paragon

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-03-1-3
Lab ID:	0812207-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.73	1.1	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/2/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-05-1-3
Lab ID: 0812207-4

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 07-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4
QCBatchID: GS090106-4-1
Run ID: GS090106-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 96.3 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090052d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.1 +/- 0.84	1.5	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-0-1

Lab ID: 0812207-5

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 210 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090151d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.42	0.53	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-P24-0-1
Lab ID:	0812207-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 210 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090151d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.56	0.97	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-P24-S-7
Lab ID: 0812207-6

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 07-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4
QCBatchID: GS090106-4-1
Run ID: GS090106-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Allquot: 91.5 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090031d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.58	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is In control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812207-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-5-7	Sample Matrix: SOIL	Prep Batch: GS090106-4	Final Aliquot: 79.8 g
Lab ID: 0812207-8	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-4-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 07-Aug-08	Run ID: GS090106-4A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 13-Jan-09	Report Basis: Dry Weight	File Name: 090067d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.64	1.2	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5
Lab ID: 0812207-9

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4
QCBatchID: GS090109-4-1
Run ID: GS090109-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 158 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090118d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.47	0.59	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5

Lab ID: 0812207-9

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 158 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090118d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.65	1.0	1	M3,G,TI T4 NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0
Lab ID: 0812207-11

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4
QCBatchID: GS090109-4-1
Run ID: GS090109-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 155 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090119d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.44	0.65	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0
Lab ID: 0812207-11

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4
QCBatchID: GS090109-4-1
Run ID: GS090109-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 155 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090119d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.60	1.1	1	M3,G,TI TH,NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/9/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5
Lab ID: 0812207-12

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4
QCBatchID: GS090109-4-1
Run ID: GS090109-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 168 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090109d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.49	0.47	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/6/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5

Lab ID: 0812207-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 168 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090109d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.60	0.91	1	G, TI +4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/9/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-0-1.0

Lab ID: 0812207-14

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 130 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090120d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.4 +/- 0.62	0.85	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/1/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-0-1.0

Lab ID: 0812207-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 130 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090120d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.75	1.5	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/16/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3

Lab ID: 0812207-17

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 126 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.4 +/- 0.63	0.79	1	G <i>NI</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3

Lab ID: 0812207-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-4

QCBatchID: GS090109-4-1

Run ID: GS090109-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 126 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090110d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	14 +/- 2.2	1.6	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-1.5-3.0
Lab ID:	0812207-19

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 159 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090112d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.1 +/- 0.52	0.54	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/9/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1.5-3.0

Lab ID: 0812207-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 159 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090112d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.65	1.2	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812207-1

KA 8/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-04-0-1	Sample Matrix: SOIL	Prep Batch: AS090217-1	Final Aliquot: 1.00 g
Lab ID: 0812207-1	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090217-1-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: AS090217-1A	Moisture(%): NA
	Date Prepared: 17-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 20-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.30	0.041	0.1	
15117-96-1	U-235	0.079 +/- 0.049	0.036	0.1	LT B4
7440-61-1	U-238	1.6 +/- 0.32	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.509	3.80	pCi/g	84.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-04-1-2.5

Lab ID: 0812207-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.039	0.1	
15117-96-1	U-235	0.083 +/- 0.049	0.034	0.1	LT B4
7440-61-1	U-238	2.0 +/- 0.39	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.483	3.85	pCi/g	85.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA 8/9/12

Date Printed: Wednesday, February 25, 2009

ALS Paragon

LIMS Version: 6.247A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-03-1-3
Lab ID:	0812207-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.035	0.1	
15117-96-1	U-235	0.10 +/- 0.056	0.035	0.1	BY
7440-61-1	U-238	1.9 +/- 0.38	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.492	3.77	pCi/g	84.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-05-1-3
Lab ID: 0812207-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.7 +/- 0.66	0.027	0.1	
15117-96-1	U-235	0.12 +/- 0.056	0.017	0.1	84
7440-61-1	U-238	3.5 +/- 0.62	0.027	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.478	4.02	pCi/g	89.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-P24-0-1
Lab ID:	0812207-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.43	0.030	0.1	
15117-96-1	U-235	0.078 +/- 0.048	0.035	0.1	LT <i>BY</i>
7440-61-1	U-238	2.1 +/- 0.41	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	3.83	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-5-7

Lab ID: 0812207-6

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.042	0.1	
15117-96-1	U-235	0.12 +/- 0.059	0.040	0.1	84
7440-61-1	U-238	2.2 +/- 0.42	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.485	3.93	pCi/g	87.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA 8/1/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-0-1

Lab ID: 0812207-7

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.044	0.1	
15117-96-1	U-235	0.087 +/- 0.052	0.047	0.1	LT 84
7440-61-1	U-238	1.6 +/- 0.32	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	3.90	pCi/g	86.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-5-7
Lab ID: 0812207-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.3 +/- 0.59	0.059	0.1	
15117-96-1	U-235	0.16 +/- 0.071	0.050	0.1	84
7440-61-1	U-238	3.4 +/- 0.61	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.490	4.02	pCi/g	89.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA 8/19/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-0-1.5
Lab ID:	0812207-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.22	0.043	0.1	
15117-96-1	U-235	0.052 +/- 0.038	0.018	0.1	LT 84
7440-61-1	U-238	0.92 +/- 0.21	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.493	4.20	pCi/g	93.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA-8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0

Lab ID: 0812207-11

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.28	0.058	0.1	
15117-96-1	U-235	0.060 +/- 0.043	0.036	0.1	LT 84
7440-61-1	U-238	1.2 +/- 0.25	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	3.84	pCi/g	85.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

ICA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5

Lab ID: 0812207-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.44	0.047	0.1	
15117-96-1	U-235	0.091 +/- 0.052	0.035	0.1	LT BH
7440-61-1	U-238	2.3 +/- 0.44	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.515	4.24	pCi/g	93.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA-812/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-0-1.0

Lab ID: 0812207-14

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.051	0.1	
15117-96-1	U-235	0.082 +/- 0.053	0.047	0.1	LT 84
7440-61-1	U-238	2.1 +/- 0.43	0.034	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	3.49	pCi/g	77.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3	Sample Matrix: SOIL	Prep Batch: AS090217-1	Final Aliquot: 1.00 g
Lab ID: 0812207-17	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090217-1-1	Prep Basis: Dry Weight
	Date Collected: 11-Aug-08	Run ID: AS090217-1A	Moisture(%): NA
	Date Prepared: 17-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 20-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	5.3 +/- 0.96	0.054	0.1	
15117-96-1	U-235	0.17 +/- 0.082	0.051	0.1	B4
7440-61-1	U-238	5.2 +/- 0.93	0.019	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.502	3.28	pCi/g	72.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

KA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-01-1.5-3.0
Lab ID:	0812207-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 17-Feb-09
Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1
QCBatchID: AS090217-1-1
Run ID: AS090217-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.2 +/- 0.75	0.050	0.1	
15117-96-1	U-235	0.20 +/- 0.083	0.037	0.1	84
7440-61-1	U-238	3.9 +/- 0.71	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.505	3.92	pCi/g	86.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812207-1

RA 8/11/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-04-1-2.5	Sample Matrix: SOIL	Prep Batch: RE090220-1	Final Aliquot: 1.02 g
Lab ID: 0812207-2	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-1-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: RE090220-1A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.80	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield Is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

KA-8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-03-1-3
Lab ID: 0812207-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.84 +/- 0.36	0.43	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

KA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-05-1-3
Lab ID: 0812207-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1
QCBatchID: RE090220-1-1
Run ID: RE090220-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.8 +/- 0.95	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

VA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-P24-5-7	Sample Matrix: SOIL	Prep Batch: RE090220-2	Final Aliquot: 1.02 g
Lab ID: 0812207-6	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-2-1	Prep Basis: Dry Weight
	Date Collected: 07-Aug-08	Run ID: RE090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 02-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.73	0.23	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

KA-3/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-01-0-1
Lab ID: 0812207-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.61	0.66	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

KA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812207
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-01-5-7
Lab ID: 0812207-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.90 +/- 0.39	0.24	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812207-1

KA 8/1/12

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812207

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-0-1

Lab ID: 0812207-7

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 07-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.505 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 1.5	2.7	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36680	32600	ug	88.9	40 - 110 %	
YTTRIUM	8713	5460	ug	62.7	40 - 110 %	
Total				55.8	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812207-1

KA 8/9/12

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

Page 1 of 1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-5-7

Lab ID: 0812208-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 68.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.71	1.2	1	M3,G,TI TH,NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

KA 8/9/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-02-10-12
Lab ID: 0812208-3

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 151 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090113d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.45	0.49	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-02-10-12
Lab ID: 0812208-3

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 151 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090113d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.66	1.2	1	M3,G,TI T4/N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
 Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
 Y2 - Chemical Yield outside default limits.
 LT - Result is less than Requested MDC, greater than sample specific MDC.
 M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
 M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
 SI - Nuclide identification and/or quantitation is tentative.
 TI - Nuclide identification is tentative.
 R - Nuclide has exceeded 8 half-lives.
 G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
 MDC - Minimum Detectable Concentration (see PAI SOP 709)
 BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-15-17

Lab ID: 0812208-4

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 149 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090124d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.52	0.71	1	G <i>NI</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RP-JS-02-15-17
Lab ID:	0812208-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 149 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090124d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.71	1.2	1	M3,G,TI T4 N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-01-1-3
Lab ID: 0812208-5

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 145 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090114d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.47	0.55	1	G N

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-01-1-3
Lab ID: 0812208-5

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 145 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090114d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.64	1.2	1	M3,G,TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-01-5-7
Lab ID: 0812208-6

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4
QCBatchID: GS090106-4-1
Run ID: GS090106-4A
Count Time: 60 minutes
Report Basis: Dry Weight

Final Aliquot: 80.2 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090055d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.82 +/- 0.40	0.77	1	LT,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-0-1

Lab ID: 0812208-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 80.2 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090032d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.53	1.1	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-01-10-12
Lab ID: 0812208-8

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 154 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090125d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.53	0.69	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
 Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
 Y2 - Chemical Yield outside default limits.
 LT - Result is less than Requested MDC, greater than sample specific MDC.
 M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
 M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
 SI - Nuclide identification and/or quantitation is tentative.
 TI - Nuclide identification is tentative.
 R - Nuclide has exceeded 8 half-lives.
 G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
 MDC - Minimum Detectable Concentration (see PAI SOP 709)
 BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-10-12

Lab ID: 0812208-8

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 154 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090125d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.77	1.3	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-05-0-1

Lab ID: 0812208-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090068d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.83	1.5	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-01-15-17
Lab ID: 0812208-10

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 159 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090115d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.45	0.51	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-15-17
Lab ID: 0812208-10

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 159 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090115d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.0	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-1-3

Lab ID: 0812208-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 110 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.60	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1-3	Sample Matrix: SOIL	Prep Batch: GS090106-4	Final Aliquot: 63.8 g
Lab ID: 0812208-12	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-4-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 07-Aug-08	Run ID: GS090106-4A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 14-Jan-09	Report Basis: Dry Weight	File Name: 090093d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.84	1.4	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-03-0-1

Lab ID: 0812208-13

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 14-Jan-09

Prep Batch: GS090106-4

QCBatchID: GS090106-4-1

Run ID: GS090106-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090061d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.9 +/- 0.88	1.4	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide Identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

KA 8/9/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-10-11

Lab ID: 0812208-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090129d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.0 +/- 0.78	1.0	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Date Printed: Saturday, February 14, 2009

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3D	Sample Matrix: SOIL	Prep Batch: GS090106-5	Final Aliquot: 65.0 g
Lab ID: 0812208-15	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-5-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 12-Aug-08	Run ID: GS090106-5A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 19-Jan-09	Report Basis: Dry Weight	File Name: 090089d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.87	1.6	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-08-0-1
Lab ID:	0812208-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 99.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.63	0.87	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3D

Lab ID: 0812208-17

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090126d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.47	0.59	1	G N I

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Date Printed: Saturday, February 14, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3D

Lab ID: 0812208-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090126d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.1	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-JS-04-0-1
Lab ID:	0812208-18

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 96.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090131d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.62	0.99	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-1-3
Lab ID: 0812208-19

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 27-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Allquot: 193 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090116d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.41	0.51	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-1-3
Lab ID: 0812208-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 193 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090116d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.53	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-04-5-7
Lab ID: 0812208-21

Library: RA226.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 27-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 177 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090127d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.0 +/- 0.75	0.62	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-04-5-7
Lab ID: 0812208-21

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 27-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 177 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090127d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.67	1.1	1	M3,G <i>NI</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-10-12

Lab ID: 0812208-22

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 111 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090132d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.57	0.66	1	TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-20

Lab ID: 0812208-23

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 179 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090119d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.41	0.48	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

KA 8/9/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-20	Sample Matrix: SOIL	Prep Batch: GS090109-5	Final Aliquot: 179 g
Lab ID: 0812208-23	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-5-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 27-Aug-08	Run ID: GS090109-5A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 21-Jan-09	Report Basis: Dry Weight	File Name: 090119d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.53	0.77	1	G, TI TH, N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-03-0-1
Lab ID:	0812208-24

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.42	0.52	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

KA 8/9/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-03-0-1

Lab ID: 0812208-24

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 27-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.54	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

KA 8/9/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3
Lab ID: 0812208-25

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5
QCBatchID: GS090106-5-1
Run ID: GS090106-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 71.2 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090133d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.74	1.0	1	M3,G,TI T4/N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

KA 8/9/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3	Sample Matrix: SOIL	Prep Batch: GS090109-5	Final Aliquot: 177 g
Lab ID: 0812208-26	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-5-1	Prep Basis: Dry Weight
Library: RA226.LIB	Date Collected: 12-Aug-08	Run ID: GS090109-5A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 21-Jan-09	Report Basis: Dry Weight	File Name: 090073d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.49	0.52	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812208-1

KA-8/9/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3

Lab ID: 0812208-26

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 12-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 177 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090073d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.60	0.71	1	G, TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812208-1

KA-8/a/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-0-1	Sample Matrix: SOIL	Prep Batch: GS090106-5	Final Allquot: 93.6 g
Lab ID: 0812208-27	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-5-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 13-Aug-08	Run ID: GS090106-5A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 19-Jan-09	Report Basis: Dry Weight	File Name: 090134d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.58	0.92	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812208-1

VA 3/1/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-5-7

Lab ID: 0812208-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.27	0.084	0.1	
15117-96-1	U-235	0.075 +/- 0.049	0.048	0.1	LT BH
7440-61-1	U-238	1.4 +/- 0.28	0.060	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.480	3.71	pCi/g	82.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/6/12

Date Printed: Friday, February 27, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-10-12

Lab ID: 0812208-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.1 +/- 0.56	0.054	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.042	0.1	84
7440-61-1	U-238	3.2 +/- 0.59	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.502	3.97	pCi/g	88.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/19/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-15-17

Lab ID: 0812208-4

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.049	0.1	
15117-96-1	U-235	0.10 +/- 0.058	0.049	0.1	B4
7440-61-1	U-238	1.9 +/- 0.38	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.493	3.89	pCi/g	86.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-1-3

Lab ID: 0812208-5

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.041	0.1	
15117-96-1	U-235	0.084 +/- 0.051	0.043	0.1	LT 84
7440-61-1	U-238	1.2 +/- 0.26	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.508	4.00	pCi/g	88.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-5-7

Lab ID: 0812208-6

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.70 +/- 0.19	0.063	0.1	
15117-96-1	U-235	0.042 +/- 0.044	0.060	0.1	U B4
7440-61-1	U-238	0.80 +/- 0.21	0.057	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.499	2.84	pCi/g	63.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/9/12

Date Printed: Friday, February 27, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-0-1

Lab ID: 0812208-7

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 17-Feb-09

Date Analyzed: 20-Feb-09

Prep Batch: AS090217-1

QCBatchID: AS090217-1-1

Run ID: AS090217-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.28	0.043	0.1	
15117-96-1	U-235	0.18 +/- 0.077	0.019	0.1	84
7440-61-1	U-238	1.2 +/- 0.26	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.477	3.72	pCi/g	83.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/9/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-10-12

Lab ID: 0812208-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.09 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.21	0.016	0.1	
15117-96-1	U-235	0.057 +/- 0.027	0.0081	0.1	LT
7440-61-1	U-238	1.2 +/- 0.21	0.0069	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.129	3.57	pCi/g	86.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/2/12

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-05-0-1

Lab ID: 0812208-9

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.523 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.7 +/- 0.63	0.015	0.1	
15117-96-1	U-235	0.20 +/- 0.082	0.052	0.1	
7440-61-1	U-238	3.5 +/- 0.60	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.634	6.92	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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KA 8/9/12

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ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-01-15-17

Lab ID: 0812208-10

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.35	0.018	0.1	
15117-96-1	U-235	0.10 +/- 0.041	0.029	0.1	
7440-61-1	U-238	2.1 +/- 0.35	0.025	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.441	3.80	pCi/g	85.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-P24-1-3

Lab ID: 0812208-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.512 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.3 +/- 0.57	0.043	0.1	
15117-96-1	U-235	0.14 +/- 0.066	0.040	0.1	
7440-61-1	U-238	3.4 +/- 0.60	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.817	7.30	pCi/g	82.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1-3

Lab ID: 0812208-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Allquot: 0.500 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.56	0.025	0.1	
15117-96-1	U-235	0.21 +/- 0.11	0.086	0.1	
7440-61-1	U-238	3.2 +/- 0.62	0.073	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.029	4.66	pCi/g	51.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-03-0-1

Lab ID: 0812208-13

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 07-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.32	0.029	0.1	
15117-96-1	U-235	0.092 +/- 0.038	0.0092	0.1	LT
7440-61-1	U-238	1.8 +/- 0.31	0.0078	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.511	3.84	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-P24-10-11
Lab ID:	0812208-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 10-Feb-09
Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3
QCBatchID: AS090210-3-1
Run ID: AS090210-3A
Count Time: 600 minutes
Report Basis: Dry Weight

Final Aliquot: 0.517 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.38	0.048	0.1	
15117-96-1	U-235	0.12 +/- 0.064	0.062	0.1	
7440-61-1	U-238	2.2 +/- 0.41	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.742	7.71	pCi/g	88.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3D

Lab ID: 0812208-15

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 23-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.19	0.025	0.1	
15117-96-1	U-235	0.051 +/- 0.028	0.021	0.1	LT NA
7440-61-1	U-238	0.98 +/- 0.18	0.018	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.86	pCi/g	86.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-0-1

Lab ID: 0812208-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.510 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.25	0.034	0.1	
15117-96-1	U-235	0.055 +/- 0.042	0.049	0.1	LT
7440-61-1	U-238	1.2 +/- 0.25	0.072	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.854	8.36	pCi/g	94.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3D

Lab ID: 0812208-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.503 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.22	0.053	0.1	
15117-96-1	U-235	0.063 +/- 0.053	0.075	0.1	U
7440-61-1	U-238	0.96 +/- 0.21	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.977	7.98	pCi/g	89.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-0-1

Lab ID: 0812208-18

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.504 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.0 +/- 0.55	0.051	0.1	
15117-96-1	U-235	0.081 +/- 0.059	0.076	0.1	LT
7440-61-1	U-238	2.6 +/- 0.48	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.970	7.14	pCi/g	79.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-1-3

Lab ID: 0812208-19

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.501 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.45	0.073	0.1	
15117-96-1	U-235	0.14 +/- 0.083	0.086	0.1	
7440-61-1	U-238	2.2 +/- 0.45	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.022	5.77	pCi/g	63.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-5-7

Lab ID: 0812208-21

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Allquot: 0.517 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	6.4 +/- 1.1	0.087	0.1	
15117-96-1	U-235	0.27 +/- 0.11	0.085	0.1	
7440-61-1	U-238	6.3 +/- 1.1	0.11	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.734	5.41	pCi/g	61.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-10-12

Lab ID: 0812208-22

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.509 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.52	0.11	0.1	M3
15117-96-1	U-235	0.19 +/- 0.078	0.052	0.1	
7440-61-1	U-238	3.1 +/- 0.55	0.077	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.883	7.41	pCi/g	83.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-JS-04-20

Lab ID: 0812208-23

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.503 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.44	0.054	0.1	
15117-96-1	U-235	0.13 +/- 0.068	0.063	0.1	
7440-61-1	U-238	2.3 +/- 0.43	0.071	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.986	7.48	pCi/g	83.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/2/12

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ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-03-0-1

Lab ID: 0812208-24

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 27-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.527 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.0 +/- 0.53	0.037	0.1	
15117-96-1	U-235	0.16 +/- 0.072	0.044	0.1	
7440-61-1	U-238	3.0 +/- 0.54	0.053	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.580	7.08	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/2/12

Date Printed: Friday, February 27, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3

Lab ID: 0812208-25

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.19	0.033	0.1	
15117-96-1	U-235	0.046 +/- 0.027	0.0096	0.1	LT
7440-61-1	U-238	0.94 +/- 0.18	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.509	3.87	pCi/g	85.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

KA 8/9/12

Date Printed: Friday, February 27, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-1-3

Lab ID: 0812208-26

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.93 +/- 0.18	0.026	0.1	
15117-96-1	U-235	0.042 +/- 0.029	0.031	0.1	LT
7440-61-1	U-238	0.97 +/- 0.19	0.021	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.456	3.48	pCi/g	78.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Date Printed: Friday, February 27, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812208

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-0-1

Lab ID: 0812208-27

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 13-Aug-08

Date Prepared: 10-Feb-09

Date Analyzed: 17-Feb-09

Prep Batch: AS090210-3

QCBatchID: AS090210-3-1

Run ID: AS090210-3A

Count Time: 600 minutes

Report Basis: Dry Weight

Final Aliquot: 0.508 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.51	0.065	0.1	
15117-96-1	U-235	0.19 +/- 0.084	0.064	0.1	
7440-61-1	U-238	2.5 +/- 0.47	0.054	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.895	7.32	pCi/g	82.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812208-1

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Date Printed: Friday, February 27, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-02-5-7
Lab ID: 0812208-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.69	0.65	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-01-5-7	Sample Matrix: SOIL	Prep Batch: RE090220-2	Final Aliquot: 1.06 g
Lab ID: 0812208-6	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-2-1	Prep Basis: Dry Weight
	Date Collected: 12-Aug-08	Run ID: RE090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 02-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.54	0.32	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA-8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-01-0-1
Lab ID: 0812208-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.65	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA 8/6/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-05-0-1
Lab ID: 0812208-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.65	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA-8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-P24-1-3
Lab ID: 0812208-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.55	0.20	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-01-1-3
Lab ID: 0812208-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.61	0.20	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA 8/9/12

Date Printed: Thursday, March 12, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-03-0-1
Lab ID: 0812208-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.8 +/- 1.5	0.82	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-P24-10-11
Lab ID: 0812208-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.75	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3D
Lab ID: 0812208-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.71 +/- 0.40	0.51	1	LT <i>KA 8/9/12</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-08-0-1
Lab ID: 0812208-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.61	0.43	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-04-0-1
Lab ID: 0812208-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 27-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.69	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

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Date Printed: Thursday, March 12, 2009

ALS Paragon
LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-JS-04-10-12	Sample Matrix: SOIL	Prep Batch: RE090220-2	Final Aliquot: 1.04 g
Lab ID: 0812208-22	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-2-1	Prep Basis: Dry Weight
	Date Collected: 27-Aug-08	Run ID: RE090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 02-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.88 +/- 0.43	0.52	1	LT NG

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA 8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RP-JS-02-1-3
Lab ID: 0812208-25

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.79	0.43	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA-8/9/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812208
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-07-0-1
Lab ID: 0812208-27

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.6 +/- 1.1	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812208-1

KA-8 a/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-5-7
Lab ID: 0812210-1

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 05-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 19-Jan-09

Prep Batch: GS090106-5
QCBatchID: GS090106-5-1
Run ID: GS090106-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 95.3 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090135d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.64	0.73	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-10-12
Lab ID: 0812210-2

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 05-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5
QCBatchID: GS090106-5-1
Run ID: GS090106-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 83.9 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090137d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.77	1.2	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-15-16
Lab ID: 0812210-3

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 05-Aug-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 195 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090100d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.32	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-15-16
Lab ID: 0812210-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 195 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090100d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.53	0.84	1	TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-04-0-1
Lab ID: 0812210-4

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 06-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5
QCBatchID: GS090106-5-1
Run ID: GS090106-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 95.4 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090138d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.65	0.82	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-04-1-3
Lab ID: 0812210-5

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 06-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5
QCBatchID: GS090106-5-1
Run ID: GS090106-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 91.4 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090139d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.71	0.81	1	TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
 Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
 Y2 - Chemical Yield outside default limits.
 LT - Result is less than Requested MDC, greater than sample specific MDC.
 M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
 M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
 SI - Nuclide identification and/or quantitation is tentative.
 TI - Nuclide identification is tentative.
 R - Nuclide has exceeded 8 half-lives.
 G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
 MDC - Minimum Detectable Concentration (see PAI SOP 709)
 BDL - Below Detection Limit

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-04-5-7	Sample Matrix: SOIL	Prep Batch: GS090106-5	Final Aliquot: 93.3 g
Lab ID: 0812210-6	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-5-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 06-Aug-08	Run ID: GS090106-5A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 20-Jan-09	Report Basis: Dry Weight	File Name: 090094d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.62	1.2	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-X26-0-1	Sample Matrix: SOIL	Prep Batch: GS090106-5	Final Aliquot: 83.5 g
Lab ID: 0812210-7	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-5-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 06-Aug-08	Run ID: GS090106-5A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 20-Jan-09	Report Basis: Dry Weight	File Name: 090140d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.67	0.94	1	G, TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

CA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-0-1

Lab ID: 0812210-9

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 88.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090095d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.70	0.92	1	TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-1-3

Lab ID: 0812210-10

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 82.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090141d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.69	1.1	1	M3,G,TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-U25-5-5.5
Lab ID: 0812210-11

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 06-Aug-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 202 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090152d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.1 +/- 0.74	0.63	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-U25-5-5.5
Lab ID: 0812210-11

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 06-Aug-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 202 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090152d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 0.78	1.3	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-N29-1-3 Lab ID: 0812210-12	Sample Matrix: SOIL Prep SOP: PAI 739 Rev 9 Date Collected: 06-Aug-08 Date Prepared: 30-Dec-08 Date Analyzed: 20-Jan-09	Prep Batch: GS090106-5 QCBatchID: GS090106-5-1 Run ID: GS090106-5A Count Time: 30 minutes Report Basis: Dry Weight	Final Allquot: 86.9 g Prep Basis: Dry Weight Moisture(%): NA Result Units: pCi/g File Name: 090096d07
--	--	---	--

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.75	1.4	1	M3, TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
 Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
 Y2 - Chemical Yield outside default limits.
 LT - Result is less than Requested MDC, greater than sample specific MDC.
 M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
 M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
 SI - Nuclide identification and/or quantitation is tentative.
 TI - Nuclide identification is tentative.
 R - Nuclide has exceeded 8 half-lives.
 G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
 MDC - Minimum Detectable Concentration (see PAI SOP 709)
 BDL - Below Detection Limit

Data Package ID: GSS0812210-1

CA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0	Sample Matrix: SOIL	Prep Batch: GS090109-5	Final Aliquot: 162 g
Lab ID: 0812210-16	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-5-1	Prep Basis: Dry Weight
Library: RA226.LIB	Date Collected: 11-Aug-08	Run ID: GS090109-5A	Moisture(%): NA
	Date Prepared: 30-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 21-Jan-09	Report Basis: Dry Weight	File Name: 090120d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.42	0.51	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0
Lab ID: 0812210-16

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 30-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5
QCBatchID: GS090109-5-1
Run ID: GS090109-5A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 162 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090120d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.59	1.1	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812210-1

CA-8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-N29-0-1

Lab ID: 0812210-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 98.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090142d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.48	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-X26-5-7

Lab ID: 0812210-18

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 92.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090097d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.69	1.1	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

KA 8/10/12

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-G27-0-1

Lab ID: 0812210-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 88.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090143d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.77	0.95	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-G27-1-3

Lab ID: 0812210-20

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 07-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-5

QCBatchID: GS090106-5-1

Run ID: GS090106-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 84.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090098d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.90	1.6	1	M3,G,TI TH NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812210-1

KA 8/10/12

Date Printed: Saturday, February 14, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-5-7

Lab ID: 0812210-1

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.30	0.038	0.1	
15117-96-1	U-235	0.092 +/- 0.051	0.033	0.1	LT
7440-61-1	U-238	1.6 +/- 0.32	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	4.10	pCi/g	91.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-10-12

Lab ID: 0812210-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.0 +/- 0.55	0.034	0.1	
15117-96-1	U-235	0.15 +/- 0.067	0.033	0.1	
7440-61-1	U-238	3.1 +/- 0.56	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	3.99	pCi/g	88.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA-8/10/12

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-15-16

Lab ID: 0812210-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.037	0.1	
15117-96-1	U-235	0.087 +/- 0.051	0.036	0.1	LT
7440-61-1	U-238	1.9 +/- 0.37	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.513	3.69	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Date Printed: Friday, February 27, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-04-0-1

Lab ID: 0812210-4

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 06-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.027	0.1	
15117-96-1	U-235	0.14 +/- 0.063	0.016	0.1	
7440-61-1	U-238	1.8 +/- 0.35	0.027	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	4.16	pCi/g	92.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Date Printed: Friday, February 27, 2009

ALS Paragon

LIMS Version: 6.248A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-04-1-3
Lab ID: 0812210-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.027	0.1	
15117-96-1	U-235	0.096 +/- 0.051	0.032	0.1	LT
7440-61-1	U-238	1.8 +/- 0.35	0.033	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.483	4.13	pCi/g	92.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-04-5-7

Lab ID: 0812210-6

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 06-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 0.500 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.35	0.091	0.1	
15117-96-1	U-235	0.088 +/- 0.075	0.087	0.1	LT
7440-61-1	U-238	1.8 +/- 0.41	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.026	7.40	pCi/g	82.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-X26-0-1	Sample Matrix: SOIL	Prep Batch: AS0902 18-3	Final Aliquot: 1.00 g
Lab ID: 0812210-7	Prep SOP: PAI 778 Rev 12	QCBatchID: AS0902 18-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Aug-08	Run ID: AS0902 18-3C	Moisture(%): NA
	Date Prepared: 18-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 21-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.33	0.046	0.1	
15117-96-1	U-235	0.063 +/- 0.044	0.050	0.1	LT
7440-61-1	U-238	1.8 +/- 0.35	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	4.02	pCi/g	89.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

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ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-X26-1-3
Lab ID:	0812210-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12

Date Collected: 06-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.85 +/- 0.20	0.061	0.1	
15117-96-1	U-235	0.059 +/- 0.044	0.052	0.1	LT
7440-61-1	U-238	0.90 +/- 0.21	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.505	3.88	pCi/g	86.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-0-1	Sample Matrix: SOIL	Prep Batch: AS090218-3	Final Aliquot: 1.00 g
Lab ID: 0812210-9	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090218-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Aug-08	Run ID: AS090218-3C	Moisture(%): NA
	Date Prepared: 18-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 21-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.40	0.046	0.1	
15117-96-1	U-235	0.13 +/- 0.062	0.019	0.1	
7440-61-1	U-238	2.2 +/- 0.42	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.516	3.94	pCi/g	87.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-1-3

Lab ID: 0812210-10

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 06-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.072	0.1	
15117-96-1	U-235	0.11 +/- 0.065	0.045	0.1	
7440-61-1	U-238	1.8 +/- 0.37	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.12	pCi/g	69.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-U25-5-5.5

Lab ID: 0812210-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 06-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	5.4 +/- 1.0	0.070	0.1	
15117-96-1	U-235	0.26 +/- 0.11	0.051	0.1	
7440-61-1	U-238	6.1 +/- 1.1	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.491	2.86	pCi/g	63.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-N29-1-3

Lab ID: 0812210-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 06-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.27	0.048	0.1	
15117-96-1	U-235	0.078 +/- 0.050	0.038	0.1	LT
7440-61-1	U-238	1.3 +/- 0.28	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.508	3.72	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0

Lab ID: 0812210-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.36	0.050	0.1	
15117-96-1	U-235	0.061 +/- 0.044	0.037	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.476	3.87	pCi/g	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

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Date Printed: Friday, February 27, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-N29-0-1
Lab ID:	0812210-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 06-Aug-08

Date Prepared: 18-Feb-09

Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3

QCBatchID: AS090218-3-1

Run ID: AS090218-3C

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.084	0.1	
15117-96-1	U-235	0.056 +/- 0.043	0.050	0.1	LT
7440-61-1	U-238	1.4 +/- 0.29	0.061	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.514	3.67	pCi/g	81.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-X26-S-7
Lab ID:	0812210-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.49	0.11	0.1	M3
15117-96-1	U-235	0.084 +/- 0.072	0.083	0.1	LT
7440-61-1	U-238	2.2 +/- 0.50	0.087	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.517	2.03	pCi/g	45.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-G27-0-1
Lab ID:	0812210-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.54	0.052	0.1	
15117-96-1	U-235	0.18 +/- 0.078	0.052	0.1	
7440-61-1	U-238	2.7 +/- 0.51	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.509	3.72	pCi/g	82.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-G27-1-3
Lab ID:	0812210-20

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 07-Aug-08
Date Prepared: 18-Feb-09
Date Analyzed: 21-Feb-09

Prep Batch: AS090218-3
QCBatchID: AS090218-3-1
Run ID: AS090218-3C
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.043	0.1	
15117-96-1	U-235	0.074 +/- 0.049	0.045	0.1	LT
7440-61-1	U-238	1.7 +/- 0.34	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	3.83	pCi/g	85.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812210-1

LA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-5-7
Lab ID: 0812210-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.62	0.55	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-10-12
Lab ID: 0812210-2

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.1 +/- 1.0	0.86	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

LA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-04-0-1
Lab ID: 0812210-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Allquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.89 +/- 0.55	0.75	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-04-1-3
Lab ID: 0812210-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.56	0.50	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA-8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-04-5-7
Lab ID: 0812210-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: RE090220-2
QCBatchID: RE090220-2-1
Run ID: RE090220-2A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.51	0.31	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-X26-0-1	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.05 g
Lab ID: 0812210-7	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.5 +/- 0.91	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-X26-1-3	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.02 g
Lab ID: 0812210-8	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.72 +/- 0.47	0.63	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-U25-0-1
Lab ID: 0812210-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.67 +/- 0.31	0.30	1	LT NG

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-U25-1-3
Lab ID: 0812210-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.52	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-N29-1-3
Lab ID: 0812210-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.58	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-N29-0-1	Sample Matrix: SOIL	Prep Batch: RE090220-3	Final Aliquot: 1.06 g
Lab ID: 0812210-17	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-3-1	Prep Basis: Dry Weight
	Date Collected: 06-Aug-08	Run ID: RE090220-3A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.79 +/- 0.34	0.32	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-X26-5-7

Lab ID: 0812210-18

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 06-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.38	0.072	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Date Printed: Thursday, March 12, 2009

ALS Paragon

LIMS Version: 6.250A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-G27-0-1
Lab ID: 0812210-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.83	0.87	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

LA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812210
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-G27-1-3
Lab ID: 0812210-20

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 07-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.69	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812210-1

KA 8/10/12

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812210

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-X26-1-3
Lab ID:	0812210-8

Sample Matrix: SOIL
Prep SOP: PAI 746 Rev 8
Date Collected: 06-Aug-08
Date Prepared: 20-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2
QCBatchID: RA090120-2-1
Run ID: RA090120-2A
Count Time: 250 minutes
Report Basis: Dry Weight

Final Aliquot: 0.501 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 1.4	2.5	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35900	32500	ug	90.4	40 - 110 %	
YTTRIUM	8713	5770	ug	66.3	40 - 110 %	
Total				59.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812210-1

KA 8/10/12

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-5-7

Lab ID: 0812211-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090145d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.66	1.1	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Date Printed: Saturday, February 14, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
 Work Order Number: 0812211
 Client Name: Freeport McMoRan Sierrita
 ClientProject ID: FMI-VRP

Field ID: C-JS-03-10-12
 Lab ID: 0812211-2

Library: Ra-226

Sample Matrix: SOIL
 Prep SOP: PAI 739 Rev 9
 Date Collected: 04-Aug-08
 Date Prepared: 02-Jan-09
 Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
 QCBatchID: GS090109-6-1
 Run ID: GS090109-6A
 Count Time: 30 minutes
 Report Basis: Dry Weight

Final Aliquot: 164 g
 Prep Basis: Dry Weight
 Moisture(%): NA
 Result Units: pCi/g
 File Name: 090153d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.45	0.70	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
 Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
 Y2 - Chemical Yield outside default limits.
 LT - Result is less than Requested MDC, greater than sample specific MDC.
 M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
 M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
 SI - Nuclide identification and/or quantitation is tentative.
 TI - Nuclide identification is tentative.
 R - Nuclide has exceeded 8 half-lives.
 G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
 MDC - Minimum Detectable Concentration (see PAI SOP 709)
 BDL - Below Detection Limit

Data Package ID: GSS0812211-1

CA 8/10/12

Date Printed: Saturday, February 14, 2009

ALS Paragon
 LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-10-12

Lab ID: 0812211-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090153d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.74	0.99	1	G, TI <i>NI</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-15-17

Lab ID: 0812211-3

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 158 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090102d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.41	0.55	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-15-17

Lab ID: 0812211-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 158 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090102d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.67	1.0	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-1-3

Lab ID: 0812211-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 84.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090100d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.79	1.5	1	M3,G,TI TH,NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-01-5-7
Lab ID:	0812211-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090146d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.4 +/- 0.91	1.1	1	M3, TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

CA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-H22-5-7
Lab ID: 0812211-6

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 31-Jul-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 200 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090160d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.41	0.43	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-H22-5-7
Lab ID:	0812211-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 200 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090160d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.54	0.89	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-0-1

Lab ID: 0812211-7

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 199 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090103d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.35	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-0-1
Lab ID: 0812211-7

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 31-Jul-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 199 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090103d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.57	0.84	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-1-3

Lab ID: 0812211-8

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 209 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090104d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.37	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

Ti - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-1-3

Lab ID: 0812211-8

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 209 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090104d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.57	0.74	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-K24-5-7
Lab ID: 0812211-9

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 31-Jul-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 192 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090105d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.39	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-K24-5-7
Lab ID:	0812211-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Jul-08

Date Prepared: 02-Jan-09

Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6

QCBatchID: GS090109-6-1

Run ID: GS090109-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 192 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090105d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.59	0.70	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-01-10-12
Lab ID: 0812211-10

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 04-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 72.0 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090147d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.77	0.98	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-02-0-1
Lab ID: 0812211-11

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 04-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 82.4 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090148d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.74	0.94	1	G, TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-02-1-3
Lab ID: 0812211-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 103 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090149d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.53	0.73	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-02-5-7
Lab ID: 0812211-13

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 04-Aug-08
Date Prepared: 02-Jan-09
Date Analyzed: 23-Jan-09

Prep Batch: GS090109-6
QCBatchID: GS090109-6-1
Run ID: GS090109-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 185 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090156d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.38	0.61	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-02-5-7	Sample Matrix: SOIL	Prep Batch: GS090109-6	Final Aliquot: 185 g
Lab ID: 0812211-13	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-6-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 04-Aug-08	Run ID: GS090109-6A	Moisture(%): NA
	Date Prepared: 02-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 23-Jan-09	Report Basis: Dry Weight	File Name: 090156d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.63	0.77	1	TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-0-1

Lab ID: 0812211-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 20-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090150d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.64	1.0	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-1-3

Lab ID: 0812211-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 74.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090152d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.62	1.0	1	M3,G <i>N1</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA-8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-5-7
Lab ID: 0812211-16

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 05-Aug-08
Date Prepared: 31-Dec-08
Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6
QCBatchID: GS090106-6-1
Run ID: GS090106-6A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 92.1 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090104d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.4	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA-8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-10-12

Lab ID: 0812211-17

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 30-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090109-5

QCBatchID: GS090109-5-1

Run ID: GS090109-5A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 180 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090074d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.46	0.51	1	G N

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA-8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-1-3

Lab ID: 0812211-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Aug-08

Date Prepared: 31-Dec-08

Date Analyzed: 21-Jan-09

Prep Batch: GS090106-6

QCBatchID: GS090106-6-1

Run ID: GS090106-6A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 86.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090108d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.73	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-5-7
Lab ID:	0812211-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.029	0.1	
15117-96-1	U-235	0.10 +/- 0.055	0.018	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.448	3.87	pCi/g	87.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA-8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-03-10-12

Lab ID: 0812211-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.6 +/- 0.67	0.032	0.1	
15117-96-1	U-235	0.21 +/- 0.084	0.019	0.1	
7440-61-1	U-238	3.5 +/- 0.66	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.485	3.39	pCi/g	75.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

LA-8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-15-17
Lab ID:	0812211-3

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.7 +/- 0.68	0.037	0.1	
15117-96-1	U-235	0.16 +/- 0.071	0.019	0.1	
7440-61-1	U-238	4.2 +/- 0.77	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.462	3.67	pCi/g	82.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

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Date Printed: Saturday, March 07, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-1-3

Lab ID: 0812211-4

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.43	0.031	0.1	
15117-96-1	U-235	0.042 +/- 0.038	0.049	0.1	U
7440-61-1	U-238	2.0 +/- 0.39	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.377	3.43	pCi/g	78.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA-8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-5-7

Lab ID: 0812211-5

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.049	0.1	
15117-96-1	U-235	0.14 +/- 0.071	0.053	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.365	3.23	pCi/g	73.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

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Date Printed: Saturday, March 07, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-H22-5-7
Lab ID:	0812211-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 31-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.51	0.051	0.1	
15117-96-1	U-235	0.13 +/- 0.064	0.018	0.1	
7440-61-1	U-238	2.6 +/- 0.49	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.415	3.88	pCi/g	88.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-0-1

Lab ID: 0812211-7

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 31-Jul-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.052	0.1	
15117-96-1	U-235	0.12 +/- 0.063	0.052	0.1	
7440-61-1	U-238	1.7 +/- 0.34	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.69	pCi/g	82.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA-8/10/12

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-K24-1-3
Lab ID:	0812211-8

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 31-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.041	0.1	
15117-96-1	U-235	0.081 +/- 0.049	0.018	0.1	LT
7440-61-1	U-238	1.3 +/- 0.28	0.052	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.449	4.03	pCi/g	90.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

VA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-K24-5-7

Lab ID: 0812211-9

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 31-Jul-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.046	0.1	
15117-96-1	U-235	0.049 +/- 0.041	0.049	0.1	U
7440-61-1	U-238	1.6 +/- 0.32	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.471	3.91	pCi/g	87.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-01-10-12
Lab ID:	0812211-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basls: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.042	0.1	
15117-96-1	U-235	0.087 +/- 0.050	0.034	0.1	LT
7440-61-1	U-238	2.4 +/- 0.46	0.039	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.213	3.69	pCi/g	87.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

VA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-02-0-1

Lab ID: 0812211-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.32	0.042	0.1	
15117-96-1	U-235	0.056 +/- 0.046	0.062	0.1	U
7440-61-1	U-238	1.8 +/- 0.37	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.413	3.84	pCi/g	87.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-1-3
Lab ID:	0812211-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.45	0.066	0.1	
15117-96-1	U-235	0.11 +/- 0.059	0.054	0.1	
7440-61-1	U-238	2.5 +/- 0.47	0.056	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.351	3.73	pCi/g	85.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

VA 8/10/12

Date Printed: Saturday, March 07, 2009

ALS Paragon

LIMS Version: 6.249A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-5-7
Lab ID:	0812211-13

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.34	0.039	0.1	
15117-96-1	U-235	0.098 +/- 0.058	0.046	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.049	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.475	3.62	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-0-1

Lab ID: 0812211-14

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.042	0.1	
15117-96-1	U-235	0.077 +/- 0.050	0.049	0.1	LT
7440-61-1	U-238	1.8 +/- 0.37	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.458	3.86	pCi/g	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-1-3

Lab ID: 0812211-15

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.35	0.098	0.1	
15117-96-1	U-235	0.12 +/- 0.081	0.083	0.1	
7440-61-1	U-238	1.5 +/- 0.36	0.063	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.479	2.33	pCi/g	52.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-5-7

Lab ID: 0812211-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.3 +/- 0.27	0.016	0.1	
15117-96-1	U-235	0.071 +/- 0.047	0.043	0.1	LT
7440-61-1	U-238	1.4 +/- 0.29	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.415	3.89	pCi/g	88.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-10-12

Lab ID: 0812211-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.037	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.043	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.490	3.91	pCi/g	87.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-04-0-1
Lab ID:	0812211-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4
QCBatchID: AS090220-4-1
Run ID: AS090220-4A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.33	0.045	0.1	
15117-96-1	U-235	0.071 +/- 0.047	0.043	0.1	LT
7440-61-1	U-238	1.5 +/- 0.31	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.517	3.92	pCi/g	86.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-04-1-3
Lab ID:	0812211-19

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-4

QCBatchID: AS090220-4-1

Run ID: AS090220-4A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.056	0.1	
15117-96-1	U-235	0.19 +/- 0.084	0.061	0.1	
7440-61-1	U-238	2.1 +/- 0.42	0.064	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.41	pCi/g	77.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-03-5-7
Lab ID:	0812211-1

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.65	0.29	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-1-3

Lab ID: 0812211-4

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.53	0.28	1	M2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-01-5-7

Lab ID: 0812211-5

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 04-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.6 +/- 0.92	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-01-10-12
Lab ID: 0812211-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.64	0.61	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

✓ 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-02-0-1
Lab ID: 0812211-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.62	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-02-1-3
Lab ID: 0812211-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3
QCBatchID: RE090220-3-1
Run ID: RE090220-3A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.60	0.39	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-0-1

Lab ID: 0812211-14

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.65	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CS-JS-03-1-3

Lab ID: 0812211-15

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.09 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.92 +/- 0.54	0.76	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-03-5-7
Lab ID:	0812211-16

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 05-Aug-08

Date Prepared: 20-Feb-09

Date Analyzed: 04-Mar-09

Prep Batch: RE090220-3

QCBatchID: RE090220-3-1

Run ID: RE090220-3A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.69	0.67	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-0-1
Lab ID: 0812211-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.82 +/- 0.33	0.18	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812211
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-04-1-3
Lab ID: 0812211-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 04-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.6 +/- 0.85	0.53	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812211-1

KA 8/10/12

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812211

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-04-0-1
Lab ID: 0812211-18

Sample Matrix: SOIL
Prep SOP: PAI 746 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2
QCBatchID: RA090120-2-1
Run ID: RA090120-2A
Count Time: 250 minutes
Report Basis: Dry Weight

Final Aliquot: 0.506 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 1.5	2.6	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35230	32000	ug	90.8	40 - 110 %	
YTTRIUM	8713	5210	ug	59.8	40 - 110 %	
Total				54.3	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812211-1

KA 8/10/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 60-80
Lab ID: 0812251-1

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090127d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.48	0.51	1	G N I

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/11/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 60-80

Lab ID: 0812251-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090127d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.70	1.1	1	M3,G,TI <i>TH, NI</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 180-200

Lab ID: 0812251-2

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090128d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.43	0.52	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 180-200

Lab ID: 0812251-2

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090128d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.53	0.88	1	G, TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 40-60

Lab ID: 0812251-3

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 165 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090166d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.50	0.59	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 40-60

Lab ID: 0812251-3

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 165 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090166d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.69	1.2	1	M3,G,TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 100-120

Lab ID: 0812251-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 77.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.51	0.79	1	G, TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 120-140

Lab ID: 0812251-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090165d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.83	1.2	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 80-100
Lab ID: 0812251-6

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 24-Sep-08
Date Prepared: 07-Jan-09
Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2
QCBatchID: GS090108-2-1
Run ID: GS090108-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 72.5 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090114d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.68	1.3	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 160-180	Sample Matrix: SOIL	Prep Batch: GS090108-2	Final Aliquot: 64.4 g
Lab ID: 0812251-7	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-2-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 25-Sep-08	Run ID: GS090108-2A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 22-Jan-09	Report Basis: Dry Weight	File Name: 090141d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.88	1.2	1	M3,G,TI T4 N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 0-20

Lab ID: 0812251-8

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090129d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.47	0.48	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 0-20

Lab ID: 0812251-8

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 162 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090129d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.58	0.88	1	G, TI 74, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 80-100

Lab ID: 0812251-9

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 175 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090167d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.52	0.56	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 80-100

Lab ID: 0812251-9

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 175 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090167d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.62	1.1	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 200-210	Sample Matrix: SOIL	Prep Batch: GS090108-2	Final Aliquot: 68.8 g
Lab ID: 0812251-10	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-2-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 03-Oct-08	Run ID: GS090108-2A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 22-Jan-09	Report Basis: Dry Weight	File Name: 090090d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.68	1.1	1	M3,G,TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Date Printed: Tuesday, February 17, 2009

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 20-40

Lab ID: 0812251-11

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 05-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090166d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 1.0	1.3	1	M3,G,TI TH,NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 180-200

Lab ID: 0812251-12

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090115d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.91	1.2	1	M3,G,TI T4,N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 200-220

Lab ID: 0812251-13

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 178 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.44	0.47	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 200-220

Lab ID: 0812251-13

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 178 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090130d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.52	0.93	1	G, TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 20-40
Lab ID: 0812251-14

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090091d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.78	1.4	1	M3,G,TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 0-20

Lab ID: 0812251-15

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 21-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 79.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090127d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.57	1.1	1	M3,G,TI T4, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 140-160

Lab ID: 0812251-16

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 62.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090092d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.67	1.4	1	M3,G,TI T4, N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 60-80

Lab ID: 0812251-17

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 100 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090128d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.63	1.0	1	TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 80-100

Lab ID: 0812251-18

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 19-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090093d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.65	1.1	1	M3,G,TI <i>TH, NI</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 20-40
Lab ID:	0812251-19

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 64.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090129d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.99	1.2	1	M3,G,TI TY, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Date Printed: Tuesday, February 17, 2009

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 40-60

Lab ID: 0812251-20

Library: RA226.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 22-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 165 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090169d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.40	0.39	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KH 8/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 40-60
Lab ID:	0812251-20

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 22-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-7

QCBatchID: GS090109-7-1

Run ID: GS090109-7A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 165 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090169d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.53	0.84	1	G, TI TH, NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 60-80
Lab ID: 0812251-22

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 74.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090094d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.58	0.95	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

VA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 240-260
Lab ID: 0812251-23

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 25-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 60 minutes

Report Basis: Dry Weight

Final Aliquot: 76.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090132d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.45	0.88	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Date Printed: Tuesday, February 17, 2009

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-05-1.5-3.0
Lab ID: 0812251-24

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 79.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090095d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.2 +/- 0.77	1.2	1	M3,G N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-Q09-0-1
Lab ID:	0812251-25

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090171d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.66	1.2	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-01-1-3
Lab ID: 0812251-26

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 29-Jul-08
Date Prepared: 07-Jan-09
Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2
QCBatchID: GS090108-2-1
Run ID: GS090108-2A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 81.5 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090120d07

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.71	1.1	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-02-5-7
Lab ID:	0812251-27

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 29-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090096d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 0.84	1.3	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-10-1.5-3.0

Lab ID: 0812251-28

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 07-Jan-09

Date Analyzed: 22-Jan-09

Prep Batch: GS090108-2

QCBatchID: GS090108-2-1

Run ID: GS090108-2A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 94.1 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090172d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.66	0.93	1	Ti TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Date Printed: Thursday, April 02, 2009

ALS Paragon

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-C22-1-3	Sample Matrix: SOIL	Prep Batch: GS090108-4	Final Aliquot: 76.3 g
Lab ID: 0812251-29	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-4-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 29-Jul-08	Run ID: GS090108-4A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 21-Jan-09	Report Basis: Dry Weight	File Name: 090081d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.66	1.0	1	M3,G N1

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 60-80
Lab ID:	0812251-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.35	0.037	0.1	
15117-96-1	U-235	0.13 +/- 0.060	0.039	0.1	
7440-61-1	U-238	1.9 +/- 0.37	0.033	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.281	3.96	pCi/g	92.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 180-200

Lab ID: 0812251-2

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 25-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.045	0.1	
15117-96-1	U-235	0.20 +/- 0.085	0.039	0.1	
7440-61-1	U-238	1.6 +/- 0.34	0.017	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.488	3.47	pCi/g	77.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/17

Date Printed: Friday, March 20, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 40-60

Lab ID: 0812251-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.9 +/- 0.56	0.059	0.1	NG
15117-96-1	U-235	0.20 +/- 0.090	0.070	0.1	
7440-61-1	U-238	2.7 +/- 0.53	0.074	0.1	NG

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.356	3.30	pCi/g	75.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 40-60

Lab ID: 0812251-3DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.036	0.1	
15117-96-1	U-235	0.15 +/- 0.069	0.035	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.219	3.43	pCi/g	81.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

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Date Printed: Friday, March 20, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 100-120
Lab ID:	0812251-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12

Date Collected: 25-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.059	0.1	
15117-96-1	U-235	0.18 +/- 0.075	0.039	0.1	
7440-61-1	U-238	2.0 +/- 0.38	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.158	3.40	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

CA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 120-140
Lab ID:	0812251-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.46	0.065	0.1	
15117-96-1	U-235	0.11 +/- 0.069	0.065	0.1	
7440-61-1	U-238	2.3 +/- 0.48	0.055	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.354	2.74	pCi/g	62.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 80-100
Lab ID:	0812251-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.051	0.1	
15117-96-1	U-235	0.11 +/- 0.060	0.060	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.059	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.427	3.78	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

VA-8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 160-180
Lab ID:	0812251-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.041	0.1	BH
15117-96-1	U-235	0.12 +/- 0.061	0.043	0.1	
7440-61-1	U-238	1.5 +/- 0.30	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.379	3.76	pCi/g	85.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 0-20

Lab ID: 0812251-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.43	0.047	0.1	
15117-96-1	U-235	0.25 +/- 0.099	0.041	0.1	
7440-61-1	U-238	2.4 +/- 0.48	0.018	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.381	3.14	pCi/g	71.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 80-100
Lab ID:	0812251-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12

Date Collected: 05-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.054	0.1	
15117-96-1	U-235	0.17 +/- 0.078	0.063	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.067	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.324	3.60	pCi/g	83.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA-8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 200-210
Lab ID:	0812251-10

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.1 +/- 0.25	0.041	0.1	BH
15117-96-1	U-235	0.090 +/- 0.056	0.041	0.1	LT
7440-61-1	U-238	1.3 +/- 0.28	0.051	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.289	3.05	pCi/g	71.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 20-40

Lab ID: 0812251-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 05-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 26-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.08 g

Prep Basls: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.062	0.1	
15117-96-1	U-235	0.21 +/- 0.082	0.041	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.198	3.29	pCi/g	78.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB06 180-200
Lab ID:	0812251-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.34	0.046	0.1	
15117-96-1	U-235	0.095 +/- 0.060	0.064	0.1	LT
7440-61-1	U-238	1.7 +/- 0.35	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.381	3.43	pCi/g	78.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA-8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 200-220

Lab ID: 0812251-13

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.039	0.1	
15117-96-1	U-235	0.13 +/- 0.066	0.046	0.1	
7440-61-1	U-238	1.6 +/- 0.33	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.439	3.57	pCi/g	80.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ET-SB02 20-40
Lab ID:	0812251-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.042	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.043	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.411	3.81	pCi/g	86.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

VA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 0-20

Lab ID: 0812251-15

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 21-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.07 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.31	0.060	0.1	BH
15117-96-1	U-235	0.044 +/- 0.039	0.051	0.1	U
7440-61-1	U-238	1.5 +/- 0.31	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.233	3.39	pCi/g	80.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 140-160

Lab ID: 0812251-16

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 23-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.37	0.016	0.1	
15117-96-1	U-235	0.094 +/- 0.055	0.044	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.038	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.303	3.59	pCi/g	83.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 60-80

Lab ID: 0812251-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 19-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.93 +/- 0.22	0.034	0.1	BH
15117-96-1	U-235	0.026 +/- 0.031	0.048	0.1	U
7440-61-1	U-238	1.1 +/- 0.25	0.050	0.1	BH

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.303	3.26	pCi/g	75.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ET-SB02 80-100

Lab ID: 0812251-18

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 19-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.96 +/- 0.22	0.045	0.1	B4
15117-96-1	U-235	0.075 +/- 0.049	0.048	0.1	LT
7440-61-1	U-238	0.91 +/- 0.21	0.041	0.1	B4

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.487	3.92	pCi/g	87.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

ICA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 20-40
Lab ID:	0812251-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3
QCBatchID: AS090220-3-1
Run ID: as090220-3x
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.39	0.059	0.1	
15117-96-1	U-235	0.14 +/- 0.075	0.070	0.1	
7440-61-1	U-238	1.9 +/- 0.39	0.069	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.371	3.15	pCi/g	72.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA-8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 40-60

Lab ID: 0812251-20

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 22-Oct-08

Date Prepared: 20-Feb-09

Date Analyzed: 27-Feb-09

Prep Batch: AS090220-3

QCBatchID: AS090220-3-1

Run ID: as090220-3x

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.41	0.047	0.1	
15117-96-1	U-235	0.26 +/- 0.10	0.050	0.1	
7440-61-1	U-238	2.2 +/- 0.44	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.498	3.44	pCi/g	76.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-02-1-3
Lab ID:	0812251-21

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2
QCBatchID: AS090220-2-1
Run ID: AS090220-2A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.5 +/- 0.82	0.046	0.1	
15117-96-1	U-235	0.20 +/- 0.085	0.021	0.1	
7440-61-1	U-238	4.4 +/- 0.81	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.457	3.59	pCi/g	80.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 60-80

Lab ID: 0812251-22

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 24-Sep-08

Date Prepared: 20-Feb-09

Date Analyzed: 25-Feb-09

Prep Batch: AS090220-2

QCBatchID: AS090220-2-1

Run ID: AS090220-2A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.05 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.39	0.048	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.038	0.1	
7440-61-1	U-238	1.9 +/- 0.38	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.288	3.40	pCi/g	79.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB06 240-260	Sample Matrix: SOIL	Prep Batch: AS090220-2	Final Aliquot: 1.01 g
Lab ID: 0812251-23	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090220-2-1	Prep Basis: Dry Weight
	Date Collected: 25-Oct-08	Run ID: AS090220-2A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 25-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.40	0.016	0.1	
15117-96-1	U-235	0.20 +/- 0.081	0.018	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.482	3.74	pCi/g	83.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-05-1.5-3.0

Lab ID: 0812251-24

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jul-08

Date Prepared: 23-Feb-09

Date Analyzed: 02-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.1 +/- 0.60	0.049	0.1	
15117-96-1	U-235	0.23 +/- 0.096	0.043	0.1	
7440-61-1	U-238	3.0 +/- 0.59	0.019	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.444	3.08	pCi/g	69.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-Q09-0-1
Lab ID:	0812251-25

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 23-Feb-09
Date Analyzed: 02-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.40	0.095	0.1	
15117-96-1	U-235	0.14 +/- 0.090	0.099	0.1	
7440-61-1	U-238	1.5 +/- 0.37	0.12	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.504	2.33	pCi/g	51.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

CA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	OD-JS-01-1-3
Lab ID:	0812251-26

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jul-08

Date Prepared: 23-Feb-09

Date Analyzed: 02-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.47	0.050	0.1	
15117-96-1	U-235	0.17 +/- 0.084	0.049	0.1	
7440-61-1	U-238	2.0 +/- 0.42	0.062	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.499	2.78	pCi/g	61.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-JS-02-5-7

Lab ID: 0812251-27

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jul-08

Date Prepared: 23-Feb-09

Date Analyzed: 07-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 1000 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.7 +/- 0.57	0.026	0.1	Y2 NG
15117-96-1	U-235	0.12 +/- 0.084	0.083	0.1	Y2 NG
7440-61-1	U-238	3.0 +/- 0.63	0.10	0.1	Y2,M3 NG

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.423	0.644	pCi/g	14.6	30 - 110 %	Y2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-10-1.5-3.0

Lab ID: 0812251-28

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.27	0.079	0.1	
15117-96-1	U-235	0.054 +/- 0.045	0.060	0.1	U
7440-61-1	U-238	1.4 +/- 0.30	0.063	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.378	3.35	pCi/g	76.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Date Printed: Thursday, April 02, 2009

ALS Paragon

LIMS Version: 6.254A

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-C22-1-3
Lab ID:	0812251-29

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jul-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.06 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.48	0.052	0.1	
15117-96-1	U-235	0.12 +/- 0.073	0.061	0.1	
7440-61-1	U-238	2.4 +/- 0.50	0.064	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.247	2.47	pCi/g	58.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812251-1

KA 8/14/12

Date Printed: Thursday, April 02, 2009

ALS Paragon

LIMS Version: 6.254A

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 100-120
Lab ID: 0812251-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.69	0.71	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 120-140
Lab ID: 0812251-5

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.8 +/- 1.1	0.56	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA-8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 80-100
Lab ID: 0812251-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.50	0.34	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 160-180
Lab ID: 0812251-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.76 +/- 0.30	0.17	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB03 200-210
Lab ID: 0812251-10

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 03-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.55	0.64	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB04 20-40
Lab ID: 0812251-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.59	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 180-200
Lab ID: 0812251-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-4
QCBatchID: RE090220-4-1
Run ID: RE090220-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.47	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 3/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 20-40
Lab ID: 0812251-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.75	0.099	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 0-20
Lab ID: 0812251-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 21-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.69	0.40	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 140-160
Lab ID: 0812251-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.53	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 3/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 60-80
Lab ID: 0812251-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.38	0.30	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ET-SB02 80-100
Lab ID: 0812251-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 19-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.1 +/- 0.41	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 20-40
Lab ID: 0812251-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.54	0.30	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

VA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-02-1-3
Lab ID: 0812251-21

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 01-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.81	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA-8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 60-80
Lab ID: 0812251-22

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 24-Sep-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.66	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB06 240-260
Lab ID: 0812251-23

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 25-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 05-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.48	0.36	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-05-1.5-3.0
Lab ID: 0812251-24

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.68	0.77	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-Q09-0-1
Lab ID: 0812251-25

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.64 +/- 0.54	0.82	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-01-1-3
Lab ID: 0812251-26

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.46	0.37	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

VA 8/4/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-JS-02-5-7
Lab ID: 0812251-27

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 29-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.60	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

Ka 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-10-1.5-3.0
Lab ID: 0812251-28

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 20-Feb-09
Date Analyzed: 11-Mar-09

Prep Batch: RE090220-5
QCBatchID: RE090220-5-1
Run ID: RE090220-5A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.61 +/- 0.40	0.58	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812251
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-C22-1-3 Lab ID: 0812251-29	Sample Matrix: SOIL Prep SOP: PAI 783 Rev 8 Date Collected: 29-Jul-08 Date Prepared: 20-Feb-09 Date Analyzed: 11-Mar-09	Prep Batch: RE090220-5 QCBatchID: RE090220-5-1 Run ID: RE090220-5A Count Time: 15 minutes Report Basis: Dry Weight	Final Aliquot: 1.04 g Prep Basis: Dry Weight Moisture(%): NA Result Units: pCi/g File Name: Manual Entry
--	--	---	---

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.73	0.76	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812251-1

KA 8/14/12

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812251

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-02-1-3

Lab ID: 0812251-21

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 01-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.500 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.0 +/- 1.7	2.3	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36670	32100	ug	87.5	40 - 110 %	
YTTRIUM	8713	5990	ug	68.7	40 - 110 %	
Total				60.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812251-1

CA 8/14/12

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-5-7
Lab ID: 0812258-1

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 72.6 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090116d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.78	1.2	1	M3,G,TI N1, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

KA 8/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-0-1

Lab ID: 0812258-2

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 191 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090172d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.9 +/- 0.49	0.53	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

KA 8/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-0-1
Lab ID:	0812258-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 191 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090172d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.63	0.86	1	TI <i>TH</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

KA 8/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-06-1-3
Lab ID: 0812258-3

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 13-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4
QCBatchID: GS090108-4-1
Run ID: GS090108-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 87.8 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090082d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.49	0.80	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-1-3

Lab ID: 0812258-4

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.4 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090159d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.62	0.99	1	G, TI NI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

EA 8/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

LIMS Version: 6.245A

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-5-7
Lab ID: 0812258-5

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 85.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090083d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	0.93	1	TI <i>TH</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-06-10-11
Lab ID: 0812258-6

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 13-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4
QCBatchID: GS090108-4-1
Run ID: GS090108-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 66.4 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090118d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.6 +/- 1.2	1.4	1	M3,G,TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-10-11
Lab ID:	0812258-7

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 04-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 87.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090160d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.2 +/- 0.64	0.94	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-JS-02-0-1 D

Lab ID: 0812258-9

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 130 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090173d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.2 +/- 0.59	0.67	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-02-0-1 D
Lab ID: 0812258-9

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8
QCBatchID: GS090109-8-1
Run ID: GS090109-8A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 130 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090173d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.80	1.3	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0 D

Lab ID: 0812258-10

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 156 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090174d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.45	0.56	1	G <i>NI</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-1.5-3.0 D
Lab ID: 0812258-10

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 28-Jan-09

Prep Batch: GS090109-8
QCBatchID: GS090109-8-1
Run ID: GS090109-8A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 156 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090174d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.68	1.3	1	M3,G,TI NI, TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-1.5-3.0 D	Sample Matrix: SOIL	Prep Batch: GS090109-8	Final Aliquot: 139 g
Lab ID: 0812258-12	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-8-1	Prep Basis: Dry Weight
Library: Ra-226	Date Collected: 11-Aug-08	Run ID: GS090109-8A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: 090177d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.9 +/- 0.67	0.71	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-01-1.5-3.0 D
Lab ID:	0812258-12

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8
QCBatchID: GS090109-8-1
Run ID: GS090109-8A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 139 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090177d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.8 +/- 1.0	1.3	1	M3,G,TI N1 T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-15-16

Lab ID: 0812258-13

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090178d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.0 +/- 0.77	0.61	1	G <i>NI</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-15-16

Lab ID: 0812258-13

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 13-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090178d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.2 +/- 0.93	1.1	1	M3,G PI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-5-7
Lab ID: 0812258-14

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4
QCBatchID: GS090108-4-1
Run ID: GS090108-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 70.0 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090084d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.76	1.1	1	M3,G,TI N1, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-10-12
Lab ID: 0812258-15

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 12-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4
QCBatchID: GS090108-4-1
Run ID: GS090108-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 74.9 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090119d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.75	0.96	1	G, TI <i>N1, T4</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-10-12
Lab ID: 0812258-17

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 13-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4
QCBatchID: GS090108-4-1
Run ID: GS090108-4A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 89.4 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090161d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.66	0.99	1	TI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5D
Lab ID: 0812258-18

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 11-Aug-08
Date Prepared: 07-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8
QCBatchID: GS090109-8-1
Run ID: GS090109-8A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 169 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090137d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.42	0.48	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-02-0-1.5D
Lab ID: 0812258-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 11-Aug-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 169 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090137d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.50	0.67	1	G, TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 80-100
Lab ID: 0812258-19

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QC Batch ID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 180 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090179d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.42	0.46	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 80-100

Lab ID: 0812258-19

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 180 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090179d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.64	1.1	1	M3,G,TI PL14

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 120-140
Lab ID: 0812258-20

Library: RA228.LIB

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090085d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.3 +/- 0.56	1.0	1	M3,G,TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 180-200

Lab ID: 0812258-21

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 189 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090139d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.2 +/- 0.28	0.38	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

Client Project ID: FMI-VRP

Field ID: ST-SB03 180-200	Sample Matrix: SOIL	Prep Batch: GS090109-8	Final Aliquot: 189 g
Lab ID: 0812258-21	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-8-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 03-Oct-08	Run ID: GS090109-8A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: 090139d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.57	0.87	1	TI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 60-80

Lab ID: 0812258-22

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090180d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.44	0.56	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 60-80

Lab ID: 0812258-22

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 164 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090180d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.58	1.2	1	M3,G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 100-120

Lab ID: 0812258-23

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090140d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.2 +/- 0.52	0.44	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 100-120

Lab ID: 0812258-23

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 06-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 167 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090140d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.78	0.95	1	G, TI NI , T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Date Printed: Tuesday, February 17, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 100-120	Sample Matrix: SOIL	Prep Batch: GS090109-8	Final Aliquot: 155 g
Lab ID: 0812258-24	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-8-1	Prep Basis: Dry Weight
Library: Ra-226	Date Collected: 03-Oct-08	Run ID: GS090109-8A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: 090181d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.2 +/- 0.55	0.63	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 100-120	Sample Matrix: SOIL	Prep Batch: GS090109-8	Final Aliquot: 155 g
Lab ID: 0812258-24	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-8-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 03-Oct-08	Run ID: GS090109-8A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: 090181d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.6 +/- 0.92	1.2	1	M3,G,TI NI , TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812258-1

KA 7/14/12

Date Printed: Tuesday, February 17, 2009

ALS Paragon

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB03 20-40	Sample Matrix: SOIL	Prep Batch: GS090108-4	Final Aliquot: 65.8 g
Lab ID: 0812258-25	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090108-4-1	Prep Basis: Dry Weight
Library: RA228.LIB	Date Collected: 02-Oct-08	Run ID: GS090108-4B	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 45 minutes	Result Units: pCi/g
	Date Analyzed: 17-Feb-09	Report Basis: Dry Weight	File Name: 090296d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.62	1.2	1	M3,G,TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

KA 8/14/12

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 120-140

Lab ID: 0812258-26

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 176 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090141d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.44	0.49	1	G <i>PL</i>

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 120-140	Sample Matrix: SOIL	Prep Batch: GS090109-8	Final Aliquot: 176 g
Lab ID: 0812258-26	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-8-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 03-Oct-08	Run ID: GS090109-8A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: 090141d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.49	0.75	1	G, TI NI, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 160-180	Sample Matrix: SOIL	Prep Batch: GS090109-8	Final Aliquot: 168 g
Lab ID: 0812258-27	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-8-1	Prep Basis: Dry Weight
Library: Ra-226	Date Collected: 03-Oct-08	Run ID: GS090109-8A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: 090182d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.45	0.44	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Date Printed: Tuesday, February 17, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 160-180	Sample Matrix: SOIL	Prep Batch: GS090109-8	Final Aliquot: 168 g
Lab ID: 0812258-27	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-8-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 03-Oct-08	Run ID: GS090109-8A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: 090182d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.73	1.2	1	M3,G,TI NI T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Gamma Spectroscopy Results

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 40-60
Lab ID: 0812258-28

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 02-Oct-08
Date Prepared: 07-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8
QCBatchID: GS090109-8-1
Run ID: GS090109-8A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 161 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090142d04A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.44	0.53	1	G PI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 40-60

Lab ID: 0812258-28

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 02-Oct-08

Date Prepared: 07-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8

QCBatchID: GS090109-8-1

Run ID: GS090109-8A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 161 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090142d04

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.51	0.86	1	G, TI NI, TY

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 140-160
Lab ID: 0812258-29

Library: Ra-226

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 03-Oct-08
Date Prepared: 07-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: GS090109-8
QCBatchID: GS090109-8-1
Run ID: GS090109-8A
Count Time: 30 minutes
Report Basis: Dry Weight

Final Aliquot: 162 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090183d09A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.5 +/- 0.47	0.50	1	G NI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Date Printed: Tuesday, February 17, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 140-160	Sample Matrix: SOIL	Prep Batch: GS090109-8	Final Aliquot: 162 g
Lab ID: 0812258-29	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090109-8-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 03-Oct-08	Run ID: GS090109-8A	Moisture(%): NA
	Date Prepared: 07-Jan-09	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: 090183d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.1 +/- 0.78	1.1	1	M3,G,TI N1, T4

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Date Printed: Tuesday, February 17, 2009

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Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB01 140-160
Lab ID: 0812258-30

Library: RA228.LIB

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9

Date Collected: 25-Sep-08

Date Prepared: 07-Jan-09

Date Analyzed: 21-Jan-09

Prep Batch: GS090108-4

QCBatchID: GS090108-4-1

Run ID: GS090108-4A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Allquot: 73.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090162d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.7 +/- 0.79	1.2	1	M3,G,TI NI TH

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110% Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-5-7	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.02 g
Lab ID: 0812258-1	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 13-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.52	0.038	0.1	
15117-96-1	U-235	0.14 +/- 0.068	0.037	0.1	
7440-61-1	U-238	2.7 +/- 0.51	0.032	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.397	3.47	pCi/g	78.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-0-1
Lab ID:	0812258-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 13-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.39	0.031	0.1	
15117-96-1	U-235	0.094 +/- 0.054	0.036	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.365	3.48	pCi/g	79.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-06-1-3
Lab ID:	0812258-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 13-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	5.5 +/- 0.96	0.015	0.1	
15117-96-1	U-235	0.23 +/- 0.086	0.018	0.1	
7440-61-1	U-238	5.5 +/- 0.96	0.035	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.460	3.83	pCi/g	85.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

KA 8/14/12

Date Printed: Friday, March 20, 2009

ALS Paragon

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-1-3	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.02 g
Lab ID: 0812258-4	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 13-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.2 +/- 0.59	0.016	0.1	
15117-96-1	U-235	0.16 +/- 0.073	0.037	0.1	
7440-61-1	U-238	3.7 +/- 0.67	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.386	3.52	pCi/g	80.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Date Printed: Friday, March 20, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-5-7	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.02 g
Lab ID: 0812258-5	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 13-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.47	0.039	0.1	
15117-96-1	U-235	0.086 +/- 0.052	0.019	0.1	LT
7440-61-1	U-238	2.0 +/- 0.41	0.017	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.392	3.29	pCi/g	74.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-06-10-11	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.00 g
Lab ID: 0812258-6	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 13-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.4 +/- 0.79	0.016	0.1	
15117-96-1	U-235	0.19 +/- 0.079	0.049	0.1	
7440-61-1	U-238	5.0 +/- 0.89	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.456	3.66	pCi/g	82.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CS-JS-02-10-11
Lab ID:	0812258-7

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 04-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.5 +/- 0.48	0.015	0.1	
15117-96-1	U-235	0.093 +/- 0.052	0.018	0.1	LT
7440-61-1	U-238	2.7 +/- 0.51	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.374	3.65	pCi/g	83.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-1-3
Lab ID:	0812258-8

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.03 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.8 +/- 0.70	0.048	0.1	
15117-96-1	U-235	0.19 +/- 0.081	0.051	0.1	
7440-61-1	U-238	3.8 +/- 0.70	0.063	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.350	3.38	pCi/g	77.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-0-1 D
Lab ID:	0812258-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 11-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.40	0.043	0.1	
15117-96-1	U-235	0.16 +/- 0.078	0.057	0.1	
7440-61-1	U-238	2.0 +/- 0.40	0.043	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.18	pCi/g	72.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-1.5-3.0 D
Lab ID:	0812258-10

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.044	0.1	
15117-96-1	U-235	0.065 +/- 0.048	0.049	0.1	LT
7440-61-1	U-238	1.8 +/- 0.37	0.047	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.429	3.43	pCi/g	77.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5 D

Lab ID: 0812258-11

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.47	0.062	0.1	
15117-96-1	U-235	0.15 +/- 0.070	0.020	0.1	
7440-61-1	U-238	2.6 +/- 0.50	0.033	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.447	3.77	pCi/g	84.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Date Printed: Friday, March 20, 2009

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-01-1.5-3.0 D
Lab ID:	0812258-12

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	4.7 +/- 0.85	0.053	0.1	
15117-96-1	U-235	0.13 +/- 0.066	0.039	0.1	
7440-61-1	U-238	4.3 +/- 0.78	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.452	3.65	pCi/g	82.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-07-15-16	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.01 g
Lab ID: 0812258-13	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 13-Aug-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	12 +/- 2.1	0.056	0.1	
15117-96-1	U-235	0.47 +/- 0.15	0.023	0.1	
7440-61-1	U-238	13 +/- 2.2	0.019	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.401	3.12	pCi/g	70.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-5-7

Lab ID: 0812258-14

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.8 +/- 0.54	0.069	0.1	
15117-96-1	U-235	0.22 +/- 0.094	0.051	0.1	
7440-61-1	U-238	2.8 +/- 0.54	0.058	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.402	3.28	pCi/g	74.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: EM-JS-08-10-12

Lab ID: 0812258-15

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 12-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	12 +/- 2.1	0.095	0.1	
15117-96-1	U-235	0.57 +/- 0.17	0.068	0.1	
7440-61-1	U-238	12 +/- 2.1	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.464	3.16	pCi/g	70.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Date Printed: Friday, March 20, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	C-JS-05-1-3
Lab ID:	0812258-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 05-Aug-08
Date Prepared: 05-Mar-09
Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3
QCBatchID: AS090305-3-1
Run ID: AS090305-3A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.44	0.055	0.1	
15117-96-1	U-235	0.085 +/- 0.052	0.038	0.1	LT NG
7440-61-1	U-238	2.1 +/- 0.42	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.411	3.58	pCi/g	81.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Date Printed: Friday, March 20, 2009

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	EM-JS-07-10-12
Lab ID:	0812258-17

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 13-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Allquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.6 +/- 0.68	0.045	0.1	
15117-96-1	U-235	0.12 +/- 0.068	0.052	0.1	
7440-61-1	U-238	3.3 +/- 0.64	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.431	3.23	pCi/g	72.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-SD-02-0-1.5D
Lab ID:	0812258-18

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 11-Aug-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.0 +/- 0.24	0.017	0.1	
15117-96-1	U-235	0.024 +/- 0.032	0.056	0.1	U
7440-61-1	U-238	1.0 +/- 0.23	0.048	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.398	3.70	pCi/g	84.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 80-100	Sample Matrix: SOIL	Prep Batch: AS090305-3	Final Aliquot: 1.03 g
Lab ID: 0812258-19	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090305-3-1	Prep Basis: Dry Weight
	Date Collected: 02-Oct-08	Run ID: AS090305-3A	Moisture(%): NA
	Date Prepared: 05-Mar-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 12-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.39	0.050	0.1	
15117-96-1	U-235	0.058 +/- 0.044	0.040	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.345	3.34	pCi/g	76.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB04 120-140

Lab ID: 0812258-20

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 06-Oct-08

Date Prepared: 05-Mar-09

Date Analyzed: 12-Mar-09

Prep Batch: AS090305-3

QCBatchID: AS090305-3-1

Run ID: AS090305-3A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.69 +/- 0.17	0.037	0.1	
15117-96-1	U-235	0.065 +/- 0.046	0.044	0.1	LT
7440-61-1	U-238	0.75 +/- 0.18	0.042	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.463	3.86	pCi/g	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 180-200
Lab ID:	0812258-21

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 07-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 1000 minutes
Report Basis: Dry Weight

Final Allquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.21	0.019	0.1	
15117-96-1	U-235	0.045 +/- 0.022	0.0083	0.1	LT
7440-61-1	U-238	1.3 +/- 0.23	0.0054	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.297	2.98	pCi/g	69.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

Client Project ID: FMI-VRP

Field ID:	ST-SB03 60-80
Lab ID:	0812258-22

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 02-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Allquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.48	0.074	0.1	
15117-96-1	U-235	0.14 +/- 0.082	0.087	0.1	
7440-61-1	U-238	2.3 +/- 0.48	0.085	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.367	2.53	pCi/g	58.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB04 100-120
Lab ID:	0812258-23

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 06-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.38	0.042	0.1	
15117-96-1	U-235	0.26 +/- 0.096	0.043	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.037	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.326	3.64	pCi/g	84.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 100-120
Lab ID:	0812258-24

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.6 +/- 0.49	0.039	0.1	
15117-96-1	U-235	0.20 +/- 0.080	0.034	0.1	
7440-61-1	U-238	2.4 +/- 0.45	0.015	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.427	3.87	pCi/g	87.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 20-40

Lab ID: 0812258-25

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 02-Oct-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.04 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.43	0.058	0.1	
15117-96-1	U-235	0.10 +/- 0.062	0.068	0.1	LT
7440-61-1	U-238	1.9 +/- 0.40	0.072	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.326	3.36	pCi/g	77.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 120-140
Lab ID:	0812258-26

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 03-Oct-08
Date Prepared: 23-Feb-09
Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1
QCBatchID: AS090223-1-1
Run ID: AS090223-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.09 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.42	0.035	0.1	
15117-96-1	U-235	0.14 +/- 0.066	0.035	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.044	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.158	3.36	pCi/g	80.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB03 160-180	Sample Matrix: SOIL	Prep Batch: AS090223-1	Final Aliquot: 1.07 g
Lab ID: 0812258-27	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090223-1-1	Prep Basis: Dry Weight
	Date Collected: 03-Oct-08	Run ID: AS090223-1A	Moisture(%): NA
	Date Prepared: 23-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.33	0.065	0.1	
15117-96-1	U-235	0.22 +/- 0.088	0.049	0.1	
7440-61-1	U-238	1.8 +/- 0.36	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.223	3.15	pCi/g	74.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: UR0812258-1

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PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: ST-SB03 40-60	Sample Matrix: SOIL	Prep Batch: AS090223-1	Final Aliquot: 1.01 g
Lab ID: 0812258-28	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090223-1-1	Prep Basis: Dry Weight
	Date Collected: 02-Oct-08	Run ID: AS090223-1A	Moisture(%): NA
	Date Prepared: 23-Feb-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 03-Mar-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.040	0.1	
15117-96-1	U-235	0.078 +/- 0.052	0.047	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.050	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.484	3.58	pCi/g	79.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB03 140-160
Lab ID:	0812258-29

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 03-Oct-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.08 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.33	0.048	0.1	
15117-96-1	U-235	0.082 +/- 0.051	0.048	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.162	3.36	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Date Printed: Friday, March 20, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	ST-SB01 140-160
Lab ID:	0812258-30

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 25-Sep-08

Date Prepared: 23-Feb-09

Date Analyzed: 03-Mar-09

Prep Batch: AS090223-1

QCBatchID: AS090223-1-1

Run ID: AS090223-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.6 +/- 0.33	0.054	0.1	
15117-96-1	U-235	0.080 +/- 0.054	0.064	0.1	LT
7440-61-1	U-238	1.9 +/- 0.38	0.063	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.427	3.54	pCi/g	79.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812258-1

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Date Printed: Friday, March 20, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-07-5-7	Sample Matrix: SOIL	Prep Batch: RE090220-7	Final Aliquot: 1.06 g
Lab ID: 0812258-1	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-7-1	Prep Basis: Dry Weight
	Date Collected: 13-Aug-08	Run ID: RE090220-7A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 13-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.60	0.36	1	L2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-06-1-3
Lab ID: 0812258-3

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.40	0.28	1	L2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-07-1-3
Lab ID: 0812258-4

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.0 +/- 0.59	0.25	1	L2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-06-5-7	Sample Matrix: SOIL	Prep Batch: RE090220-7	Final Aliquot: 1.04 g
Lab ID: 0812258-5	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-7-1	Prep Basis: Dry Weight
	Date Collected: 13-Aug-08	Run ID: RE090220-7A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 13-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.54	0.44	1	L2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-06-10-11
Lab ID: 0812258-6

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.38	0.21	1	L2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CS-JS-02-10-11
Lab ID: 0812258-7

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 04-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.7 +/- 0.93	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-JS-02-1-3
Lab ID: 0812258-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.55	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5 D
Lab ID: 0812258-11

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 11-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 17-Mar-09

Prep Batch: RE090220-6
QCBatchID: RE090220-6-1
Run ID: RE090220-6A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.7 +/- 0.46	0.20	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-08-5-7
Lab ID: 0812258-14

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.0 +/- 0.41	0.34	1	LZ

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-08-10-12
Lab ID: 0812258-15

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 12-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.4 +/- 0.86	0.27	1	L2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: C-JS-05-1-3
Lab ID: 0812258-16

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 05-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	5.0 +/- 1.1	0.34	1	LZ

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: EM-JS-07-10-12
Lab ID: 0812258-17

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 13-Aug-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.49	0.40	1	L2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB04 120-140
Lab ID: 0812258-20

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 06-Oct-08
Date Prepared: 20-Feb-09
Date Analyzed: 13-Mar-09

Prep Batch: RE090220-7
QCBatchID: RE090220-7-1
Run ID: RE090220-7A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.07 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.4 +/- 0.72	0.52	1	L2

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8
Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812258
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: ST-SB01 140-160	Sample Matrix: SOIL	Prep Batch: RE090220-7	Final Aliquot: 1.04 g
Lab ID: 0812258-30	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-7-1	Prep Basis: Dry Weight
	Date Collected: 25-Sep-08	Run ID: RE090220-7A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 16-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.52	0.33	1	LZ

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812258-1

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Date Printed: Friday, March 27, 2009

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	RA-JS-02-1-3
Lab ID:	0812258-8

Sample Matrix: SOIL
Prep SOP: PAI 746 Rev 8
Date Collected: 11-Aug-08
Date Prepared: 20-Jan-09
Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2
QCBatchID: RA090120-2-1
Run ID: RA090120-2A
Count Time: 250 minutes
Report Basis: Dry Weight

Final Aliquot: 0.502 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	8.9 +/- 3.1	2.7	5	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35840	32500	ug	90.8	40 - 110 %	
YTTRIUM	8713	5310	ug	61.0	40 - 110 %	
Total				55.4	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812258-1

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Date Printed: Friday, February 13, 2009

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: RA-SD-01-0-1.5 D

Lab ID: 0812258-11

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 11-Aug-08

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Report Basis: Dry Weight

Final Aliquot: 0.504 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 1.3	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36970	33500	ug	90.7	40 - 110 %	
YTTRIUM	8713	5920	ug	67.9	40 - 110 %	
Total				61.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812258-1

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Date Printed: Friday, February 13, 2009

ALS Paragon

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Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812258

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: C-JS-05-1-3	Sample Matrix: SOIL	Prep Batch: RA090120-2	Final Aliquot: 0.503 g
Lab ID: 0812258-16	Prep SOP: PAI 746 Rev 8	QCBatchID: RA090120-2-1	Prep Basis: Dry Weight
	Date Collected: 05-Aug-08	Run ID: RA090120-2A	Moisture(%): NA
	Date Prepared: 20-Jan-09	Count Time: 250 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	4.6 +/- 2.0	2.7	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36450	33300	ug	91.3	40 - 110 %	
YTTRIUM	8713	5130	ug	58.9	40 - 110 %	
Total				53.7	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812258-1

KA 8/14/12

Date Printed: Friday, February 13, 2009

ALS Paragon

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LIMS Version: 6.244A

Former C Pond and C Pond Spoils

Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
Former C Pond																							
C-JS01-0-1	0	1		8/1/2008	0.4	5.3	79.2	0.6	<2	9	NA	7	677	56.6	338	<0.2	135	7	0.33	94.2	<0.19	3.39	149
C-JS01-1-3	1	3		8/1/2008	0.5	4.5	136	0.7	0.6	8	NA	8	763	46.3	329	0.04	194	6	0.4	92.5	<0.18	4.1	188
C-JS02-0-1	0	1		8/1/2008	0.2	3.4	116	1.3	1.7	8	NA	14	794	30.5	551	<0.2	99	9	0.39	92.9	<0.19	4.64	362
C-JS02-1-3	1	3		8/1/2008	<1	1.8	64.9	0.5	<2	6	NA	5	399	10	170	<0.2	18	6	0.18	94.6	<0.12	4.34	180
C-JS02-5-7	5	7		8/1/2008	<1 UJ	1.6	143	0.7	1	4	NA	9	442	37.3 J	373	<0.2	5	7	0.07	89.9	<0.19	9.38	1070
C-JS03-0-1	0	1		8/4/2008	0.5	6.6	82.5	1.4	<2	11	NA	12	1020	74.8	573	<0.2	199	10	<0.69	94.1	0.2	6.11	256
C-JS03-1-3	1	3		8/4/2008	<1	3.3	136	0.7	0.7	8	NA	8	485	53.2	351	<0.2	37	6	<0.29	93.7	0.22	3.7	442
C-JS03-5-7	5	7		8/4/2008	<1	2.7	88.1	0.6	<2	12	NA	6	371	45.9	256	<0.2	18	6	<0.23	89	0.15	3.15	255
C-JS03-10-12	10	12		8/4/2008	<1	2.2	85.8	0.7	<2	8	NA	4	365	89.3	211	<0.2	7	4	<0.41	86	0.18	13	178
C-JS03-15-17	15	17		8/4/2008	<1	2.8	95.6	0.8	<2	10	NA	6	442	66.6	270	<0.2	14	5	<0.42	81.9	0.2	15.3	207
C-JS04-0-1	0	1		8/5/2008	0.4	8.9	73	1.2	<2	23	NA	12	671	44.4	664	<0.2	98	11	0.3	90.7	0.18	4.05	245
C-JS04-1-3	1	3		8/5/2008	<1	1.4	137	0.5	<2	6	NA	7	491	15.1	333	<0.2	16	6	0.15	95.4	0.28	3.28	45
C-JS04-5-7	5	7		8/5/2008	<1	2.3	152	0.6	<2	11	NA	11	420	56.1	388	<0.2	38	8	0.26	93.3	0.27	3.23	106
C-JS04-10-12	10	12		8/5/2008	0.7	4.7	88.1	0.4	2.1	9	NA	11	2780	41.4	187	<0.2	537	6	2.39	84.4	0.22	7.23	135
C-JS04-15-16	15	16		8/5/2008	0.7	3.9	103	0.5	<2	7	NA	7	1150	54.8	155	<0.2	276	4	1.02	85	0.12	4.43	65
C-JS05-0-1	0	1		8/5/2008	0.2 J	4.2	120	0.9	1.2	16	NA	10	481	477	838	<0.2	74	7	<1	92.7	0.18	5.66	315
C-JS05-1-3	1	3		8/5/2008	0.3	11.2	104 J	<1	0.6	3	NA	1	185	3740	78.1 J	<0.2	18	<5	<5	94.5	0.62	4.19	156 J
C Pond Spoils																							
CS-JS01-0-1	0	1		8/4/2008	0.5	8.7	82.3	0.6	<2	14	<4	7	423	65.1	386	<0.2	142	6	<0.62	96.3	0.22	3.67	124
CS-JS01-1-3	1	3		8/4/2008	<1	2.2	121	0.6	<2	37	NA	8	432	90.5	546	<0.2	54	6	<0.26	95.5	0.2	4.66	172
CS-JS01-5-7	5	7		8/4/2008	0.3	3.6	146	0.7	<2	5	NA	10	602	343	486	<0.2	134	5	<0.48	94	0.23	6.09	302
CS-JS01-10-12	10	12		8/4/2008	1	5.8	123	0.7	<2	9	NA	12	4580	47.9	392	<0.2	735	5	<3.37	77.9	0.27	6.9	150
CS-JS02-0-1	0	1		8/4/2008	0.3	4	157	0.6	<2	8	NA	9	640	126	348	<0.2	81	6	<0.41	93.9	0.32	3.77	218
CS-JS02-1-3	1	3		8/4/2008	0.2	3.3	85.6	0.7	<2	7	NA	7	448	25.7	269	<0.2	28	5	<0.32	95.8	0.26	3.28	269
CS-JS02-5-7	5	7		8/4/2008	<1	1.6	366	0.5	<2	5	NA	11	131	20.3	430	<0.2	5	9	<0.19	95.8	0.38	3	1140
CS-JS02-10-11	10	11		8/4/2008	0.7 J	5.3	138	0.6	8.3	5	NA	12	448	376	717	<0.2	15	8	<0.24	95.6	0.4	7.77	3630
CS-JS03-0-1	0	1		8/5/2008	0.3	3.8	95.4	0.4	<2	8	NA	17	562	57.2	279	<0.2	51	5	0.28	94.6	0.17	11	129
CS-JS03-1-3	1	3		8/5/2008	0.3	3.5	123	0.6	<2	8	NA	8	802	48.8	273	<0.2	66	6	0.37	95.2	0.23	3.24	154
CS-JS03-5-7	5	7		8/5/2008	0.2	2.9	142	0.6	<2	13	NA	10	770	88.7	478	<0.2	46	10	0.3	95	0.31	3.01	217
CS-JS03-10-12	10	12		8/5/2008	0.3	3.3	201	0.4	<2	8	NA	11	641	71.4	371	0.04	98	9	0.34	93.4	0.35	3	456
CS-JS04-0-1	0	1		8/6/2008	0.4	3.2	111	0.4	<2	7	NA	8	557	131	375	<0.2	281	6	0.49	90.7	0.31	2.94	207
CS-JS04-1-3	1	3		8/6/2008	0.6 J	4.3	101	0.4	<2	17	NA	8	658	18.2	209	<0.2	822	5	0.88	93.1	0.19	3.42	76
CS-JS04-5-7	5	7		8/6/2008	<1	1.6	216	0.6	1.4	6	NA	14	425	16.3	495	<0.2	8	9	0.1	95.1	0.4	3.29	451
CS-JS05-0-1	0	1		8/27/2008	0.2	3.9	294	0.5	<2	5	NA	12	116	38.1	515	<0.2	19	11	0.16	97.8	0.36	5.08	134
CS-JS05-1-3	1	3		8/27/2008	0.5	14.6	103	0.6	1.7	4	NA	6	148	280	538	<0.2	17	6	0.39	95.9	0.17	8.01	502
CS-JS05-1-3D	1	3 Duplicate		8/27/2008	0.4	14.5	147	0.6	1.7	5	NA	7	120	212	495	<0.2	13	7	0.37	94.9	0.23	8.81	417
CS-JS06-0-1	0	1		8/27/2008	0.2	1.6	213	0.4	<2	5	NA	16	175	30.5	501	<0.2	7	12	0.14	97.4	0.49	3.15	168
CS-JS06-1-3	1	3		8/27/2008	0.2 J	1.2	168	0.5	1	5	NA	11	149	3.5	373	<0.2	3	9	0.13	96.9	0.5	2.88	257
U25-0-1	0	1		8/6/2008	0.4	3.2	265	0.6	0.6	7	NA	10	728	100	398	<0.2	113	7	0.32	94.2	0.25	3.65	234
U25-1-3	1	3		8/6/2008	0.4	4.6	156	0.7	<2	8	NA	11	1210	136	366	<0.2	292	7	0.72	94.5	0.23	3.89	233
U25-5-5.5	5	5.5		8/6/2008	0.3	8.6	88.7	0.6	0.6	7	NA	9	204	433	693	0.05	57	6	0.26	96.8	0.15	14.1	971

Old D Pond

Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
OD-JS01-0-1	0	1		7/29/2008	0.3	3.6	121	0.3	<2	15	NA	9	1770	17.7	231	<0.2	95	6	1.1	89.8	0.25	5.3	99
OD-JS01-1-3	1	3		7/29/2008	<1	1.8	149	<1	<2	9	NA	10	121	2.1	328	<0.2	8	7	0.11	95.9	0.28	2.54	42
OD-JS02-0-1	0	1		7/29/2008	0.4	3.4	96.8	<1	<2	8	NA	7	1840	13.8	250	<0.2	304	6	1.44	96.6	0.28	2.92	83
OD-JS02-1-3	1	3		7/29/2008	<1	1.4	170	0.5	<2	9	NA	13	1310	4.43	391	<0.2	9	9	0.11	95.9	0.32	3.68	89
OD-JS02-5-7	5	7		7/29/2008	<1	0.8	139	0.5	<2	9	NA	11	110	2.12	378	<0.2	8	9	0.71	96.5	0.35	7.34	45
OD-JS03-0-1	0	1		8/27/2008	0.6	10.6	118	0.3	<2	8	NA	8	1470	19.3	236	<0.2	97	7	0.85	86.4	0.23	4.32	111
OD-JS03-1-3	1	3		8/27/2008	0.4	6.4	114	<1	<2	5	NA	6	1510	10.6	203	<0.2	74	6	0.72	84.1	0.23	3.31	71
OD-JS03-1-3D	1	3	Duplicate	8/27/2008	0.3	2.9	87.4	<1	<2	7	NA	9	1800	14.9	186	<0.2	74	6	0.78	89.9	0.22	3.89	76
OD-SD01-0-1.5	0	1.5		7/28/2008	0.3	2	184	0.4	<2	13	NA	11	361	5.32	332	<0.2	87	30	0.23	96	0.29	3.11	51
OD-SD01-1.5-3	1.5	3		7/28/2008	<1	1.2	185	<1	<2	14	NA	10	125	2.59	346	<0.2	6	29	0.08	96.4	0.28	7.42	43
OD-SD02-0-1.5	0	1.5		7/28/2008	0.2	2.2	173	0.5	<2	13	NA	12	376	7.63	390	<0.2	107	32	0.42	95.1	0.3	4.66	60
OD-SD02-1.5-3	1.5	3		7/28/2008	<1	0.9	173	0.2	<2	9	NA	9	27	1.89	320	<0.2	3	26	0.07	97.8	0.32	3.37	41
OD-SD03-0-1.5	0	1.5		7/28/2008	0.3	2.7	158	0.4	<2	18	NA	11	2350	46.7	316	<0.2	100	31	0.41	95.7	0.28	7.57	147
OD-SD03-1.5-3	1.5	3		7/28/2008	<2	2.8	87.9 J	0.3	0.5	13	NA	8	4390	253	173	0.05	145	30	0.4	95.7	0.2	7.8	201
OD-SD04-0-1.5	0	1.5		7/28/2008	0.3	3.1	118	0.4	<2	11	NA	11	1640	8.86	262	<0.2	128	29	0.53	95.9	0.3	4.25	68
OD-SD04-1.5-3	1.5	3		7/28/2008	<1	2.1	133	0.3	<2	9	NA	9	671	2.2	258	<0.2	25	27	0.19	97.9	0.26	2.18	48
OD-SD05-0-1.5	0	1.5		7/29/2008	0.8	6.2	141 J	0.6	1.1	22	NA	13	3960	102	365	0.05	230	8	1.04	93.5	0.39	5.57	179
OD-SD05-1.5-3	1.5	3		7/29/2008	0.3	4.6	169	0.5	<2	13	NA	12	916	35.3	402	<0.2	63	7	0.47	93.8	0.28	10.3	105
OD-SD06-0-1.5	0	1.5		7/29/2008	0.5	5.3	109	0.5	<2	13	NA	11	2590	29.3	334	<0.2	115	7	1.04	91.7	0.3	4.33	198
OD-SD06-1.5-3	1.5	3		7/29/2008	<1	3.2	122	0.5	<2	12	NA	14	1130	7.26	552	<0.2	9	11	0.23	97.5	0.23	6.42	218

Former E Pond

Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
E-JS01-0-1		0	1	7/14/2008	0.3	2.9	146	<1	0.8	5	NA	10	2650	22.9	369	<0.2	104	11	0.78	95.2	0.17	3.11	197
E-JS01-1-3		1	3	7/14/2008	0.2	2.5	122	<1	<2	3	NA	8	1810	19.1	327	<0.2	79	10	0.59	94.8	0.13	3.04	165
E-JS01-5-7		5	7	7/14/2008	<1	2	203	0.3	<2	4	NA	6	1510	6.62	182	<0.2	246	9	0.42	90.8	0.12	2.9	134
E-JS02-0-1		0	1	7/14/2008	0.3	3	183	0.3	0.5	7	NA	10	1160	83.5	408	<0.2	138	15	0.57	96.3	0.21	3.62	98
E-JS02-1-3		1	3	7/14/2008	<1	4	75.1	0.5	<2	6	NA	8	1290	10.2	719	<0.2	98	12	0.67	97.6	<0.3	9.68	87

Former CLEAR Plant

Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
CP-JS01-0-1	0	1		7/15/2008	0.4	7.3	654	1.3	<2	8	NA	8	1390	5.93	297	0.06	15	8	0.28	81.1	0.3	2.36	45
CP-JS01-1-3	1	3		7/15/2008	0.4 J	12.3	336	0.8	<2	7	NA	12	781	7.4	379	<0.2	53	8	0.69	94.9	<0.3	4.29	39
CP-JS01-5-7	5	7		7/15/2008	5.9	32.8	130	0.7	<2	7	NA	12	822	44.3	482	<0.2	34	7	0.24	96.3	0.39	5.11	42
CP-JS01-10-12	10	12		7/15/2008	0.7	28.1	159	<5	<8	3	NA	18	506	8.98	1240	<0.2	200	14	1.68	94.4	0.36	7.77	65
CP-JS02-0-1	0	1		7/11/2008	1	6.3	36.8	0.8	<2	3	NA	12	2690	39.7	345	0.07	618	2	3.15	93.4	0.12	6.34	114
CP-JS02-1-3	1	3		7/11/2008	0.2	2.8	77.4	0.8	<2	7	NA	5	174	7.39	122	<0.2	27	4	0.17	94.6	<0.3	0.93	34
CP-JS03-0-1	0	1		7/14/2008	<1	3.3	164 J	0.3	0.7	7	NA	11	1700	24.5	456	<0.2	75 J	15	<0.67	94.9	0.29	4.29	158
CP-JS03-1-3	1	3		7/14/2008	<1 UJ	2	189	0.2	<2	9	NA	12	888	13	456	<0.2	20	15	<0.31	97.4	0.22	3.96	129
CP-JS03-5-7	5	7		7/14/2008	<1	2	205	0.4	<2	8	NA	11	1680	5.98	496	<0.2	26	13	0.44	95.6	0.49	5.27	78
CP-JS04-0-1	0	1		8/27/2008	0.4	4.5	165 J	0.5	<2	5 J	NA	13	1710	14.3	396	<0.2	223	8	1.26	95.6	0.35	4.96	82
CP-JS04-1-3	1	3		8/27/2008	0.2	1.6	172	0.4	<2	5 J	NA	12	684	4.55	469	<0.2	24	8	0.26 J	95.6	0.28 J	5.03 J	77
CP-JS04-5-7	5	7		8/27/2008	0.4	8.7	183	0.4	<2	5	NA	11	1400	10.9	343	<0.2	202	7	0.76	93.9	0.36	16	63
CP-JS04-10-12	10	12		8/27/2008	<1	2.3	106	0.4	<2	5	NA	9	1080	5.36	347	<0.2	34	7	0.56	94.4	0.26	8.72	71
CP-JS04-15-17	15	17		8/27/2008	0.2	2.1	108	0.5	<2	5	NA	8	1760	7.04	374	<0.2	51	7	0.48	95.2	0.22	7.39	59
CP-JS04-20	20	20		8/27/2008	<1	2.2	169	0.4	<2	7	NA	10	582	4.12	350	<0.2	24	8	0.29	95.5	0.27	6.96	29
CP-SD01-0-1.5	0	1.5		7/16/2008	<1	2.1	145	0.4	<2	6	NA	10	979	5.49	342	<0.2	121	8	0.37	95.9	0.23	4.04	49
CP-SD01-1.5-3	1.5	3		7/16/2008	<1	1	140	0.4	<2	6	NA	9	253	1.72	314	<0.2	4	8	0.08	97.3	0.25	2.34	30
CP-SD10-0-1.5	0	1.5		7/28/2008	0.2	3.6	161	0.5	<2	11	NA	9	570	6.23	278	<0.2	84	29	0.34	97.5	0.25	4.13	47
CP-SD10-1.5-3	1.5	3		7/28/2008	<1	1.2	193	0.4	<2	13	NA	12	269	1.81	332	<0.2	3	31	<0.3	97.6	0.32	4.41	53
CP-SD02-0-1.5	0	1.5		7/16/2008	<1	1.1	117	<1	<2	3	NA	6	451	4	207	<0.2	32	6	0.31	95.8	0.18	2.5	31
CP-SD02-1.5-3	1.5	3		7/16/2008	<1	1.5	41.1	0.3	<2	2	NA	3	780	3.78	148	<0.2	18	2	0.21	93.1	<0.3	2.82	30
CP-SD03-0-1.5	0	1.5		7/16/2008	<1	2.9	95.3	0.7	<2	5	NA	7	995	9.49	257	<0.2	114	5	0.36	97	0.13	4.05	48
CP-SD03-1.5-3	1.5	3		7/16/2008	<1	1.9	112	0.5	<2	4	NA	7	335	5.32	302	<0.2	44	6	0.2	97.5	0.14	3.86	34
CP-SD04-0-1.5	0	1.5		7/17/2008	<1	1.8	166	0.6	<2	7	NA	11	1180	4.25	403	<0.2	40	10	0.36	96.7	0.43	4.05	57
CP-SD04-1.5-3	1.5	3		7/17/2008	<1	1	170	0.4	<2	7	NA	11	512	2.14	448	<0.2	7	10	0.12	97.6	0.35	4.76	46
CP-SD05-0-1.5	0	1.5		7/16/2008	<1	5.4	123	0.6	<2	6	NA	11	561	8.74	343	<0.2	126	7	0.51	96.3	0.13	3.61	43
CP-SD05-1.5-3	1.5	3		7/16/2008	<1	3.6	181	0.5	<2	6	NA	11	283	4.91	359	<0.2	24	8	0.31	97.1	0.17	2.86	42
CP-SD06-0-1.5	0	1.5		7/16/2008	<1	3.7	177	0.7	<2	6	NA	17	976	4.17	447	<0.2	43	10	0.46	96.6	0.29	5.54	86
CP-SD06-1.5-3	1.5	3		7/16/2008	<1	4	174	0.5	<2	6	NA	11	729	3.75	375	<0.2	37	8	0.26	97.5	0.28	3.81	39
CP-SD07-0-1.5	0	1.5		7/23/2008	0.2	2.9	136	0.9	<2	14	NA	9	439	7.05	298	<0.2	42	33	0.34	94.6	0.27	3.45	45
CP-SD07-1.5-3	1.5	3		7/23/2008	0.2	0.8	166	0.5	<2	9	NA	11	180	2.49	344	<0.2	2	31	<0.3	97.8	0.3	2.19	47
CP-SD08-0-1.5	0	1.5		7/28/2008	0.2	2	135	0.5	<2	12	NA	10	599	6.87	283	<0.2	86	31	0.27	96	0.25	5.96	50
CP-SD08-1.5-3	1.5	3		7/28/2008	<1	1.2	164	0.5	<2	11	NA	11	142	3.69	300	<0.2	9	27	0.09	96.4	0.33	3.99	52
CP-SD09-0-1.5	0	1.5		7/28/2008	0.3	1.9	139	0.4	<2	11	NA	10	1100	11.3	312	<0.2	157	29	0.3	94.2	0.21	2.44	75
CP-SD09-1.5-3	1.5	3		7/28/2008	<1	0.7	131	0.2	<2	11	NA	9	380	26.6	239	<0.2	25	28	<0.3	95.8	0.25	2.46	52
M04-0-1	0	1		7/11/2008	2.3	12.6	130	0.5	0.7	9	NA	9	9390	48.1	333	0.15	704	7	3.09	91.6	0.24	5.55	272
M04-1-2.5	1	2.5		7/11/2008	1.1	7.5	142	0.4	0.6	26	NA	5	3900	48.1	319	0.16	206	7	1.29	90.9	0.12	3.01	212
M04-5-5.4	5	5.4		7/11/2008	<1	1.5	197	0.5	<2	6	NA	11	1720	6.55	374	<0.2	48	7	0.87	95.6	0.41	9.05	45
M06-0-1	0	1		7/11/2008	<1	2.6	67.1	0.5	<2	6	NA	4	207	7.76	159	<0.2	23	3	0.23	92.1	0.11	1.45	26
M06-1-3	1	3		7/11/2008	0.2	3	92.4	0.7	<2	7	NA	4	200	8.17	157	<0.2	14	4	0.35	95.3	0.14	1.35	27
N08-0-1	0	1		7/11/2008	<1 UJ	4.1	169	0.4	<2	5	NA	11	1070	10.1	504	<0.2	27	8	0.42	92.5	0.27	4.77	94
N08-1-3	1	3		7/11/2008	0.6	7.5	188 J	0.4 J	<2 UJ	7 J	NA	12 J	2420	16.3	294	0.04	149 J	9 J	0.85	95.4	0.53	8.99	161 J
N08-5-7	5	7		7/11/2008	0.5	7.7	186	0.4	<2	11	NA	11	1100	9.56	365	<0.2	77	9	0.54	96.5	0.41	9.35	66
N08-10-11	10	11		7/11/2008	2.9	41.9	213	0.6	<2	14	NA	9	1190	9.66	271	0.1	106	9	1.58	95.3	0.34	9.05	73
O03-0-1	0	1		7/11/2008	<1	2.3	251	0.5	<2	8	NA	14	1700	5.35	386	<0.2	102	11	0.45	98	0.4	4.91	119
O03-1-3	1	3		7/11/2008	<1	1.2	212	<1	<2	5	NA	13	298	1.72	440	<0.2	2	11	0.81	99.2	0.31	7.25	77
O09-0-1	0	1		7/11/2008	<1	3.5	142	0.5	<2	5	NA	11	913	11.2	469	<0.2	69	8	0.39	93.5	0.32	4.91	106
O09-1-3	1	3		7/11/2008	<1	3.4	187	0.5	<2	7	NA	13	1500	26.7	442	<0.2	43	10	0.45	95.7	0.35	5.66	146
O09-5-7	5	7		7/11/2008	<1	2.6	158	0.4	<2	12	NA	9	2480	18.6	317	<0.2	36	9	0.39	95.5	0.29	3.4	78
O09-10-12	10	12		7/11/2008	0.4	3.7	155	0.4	1.1	25	NA	11	1670	46.1	343	<0.2	73	11	0.84	94.6	0.31	3.45	123
O09-15-17	15	17		7/11/2008	<1	1.4	155	0.3	<2	7	NA	10	666	6.56	326	<0.2	16	9	0.23	95.2	0.36	2.62	147
P04-0-1	0	1		7/15/2008	<1	1.6	206	0.4	<2	8	NA	7	626	4.87	275	<0.2	33	7	0.48	95.2	0.37	3.77	34
P04-1-3	1	3		7/15/2008	<1	1	154	<1	<2	3	NA	8	518	1.2	295	<0.2	4	6	0.07	95.4	0.29	2.41	39
P05-0-1	0	1		7/15/2008	<1	1.6	115	0.4	<2	5	NA	9	973	7.41	330	<0.2	72	7	0.34	95.5	0.22	4.75	55
P05-1-3	1	3		7/15/2008	<1	1.1	197	0.4	<2	4	NA	7	289	2.05	307	<0.2	3	6	0.07	95.3	0.22	3.16	29
P07-0-1	0	1		7/17/2008	<1	1.5	99.5	0.4	<2	6	NA	8	538	9.36	293	<0.2	26	7	0.36	94.3	0.15	3.24	44
P07-1-3	1	3		7/17/2008	<1	1.1	80.4	0.3	<2	5	NA	7	210	3.38	276	<0.2	31	6	0.24	96.7	0.14	3.79	39
P07-5-7	5	7		7/17/2008	<1	1.4	101	<1	<2	13	NA	8	333	3.79	283	<0.2	53	8	0.5	97.8	0.16	4.03	88
P12-0-1	0	1		7/23/2008	0.9	5.5	81.4	0.7	<2	13	NA	6	1680	39	167	<0.2	239	31	1.48	93.4	0.26	3.15	96
P12-1-3	1	3		7/23/2008	0.3	3.4	49.9	0.8	<2	10	NA	3	337	7.98	85	<0.2	9	31	0.19	94.2	0.18	1.3	27
Q09-0-1	0	1		7/23/2008	0.3 J	2.3	120	0.6	<2	12													

Former Esperanza Mill

Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
EM-JS01-0-1	0	1		8/1/2008	0.5	4.3	103	0.6	<2	7	NA	8	840	24	238	<0.2	143	7	0.46	94.5	<0.28	2.9	88
EM-JS01-1-3	1	3		8/1/2008	<1	3.1	228	0.8	0.8	11	NA	10	543	9.8	388	<0.2	8	13	0.12	91.2	<0.26	3.64	187
C22-0-1	0	1		7/29/2008	2	13.9	82.7	0.5	0.8	19	NA	16	5480	85.2	323	0.2	4800	5	7.25	95	0.21	4.74	332
C22-1-3	1	3		7/29/2008	0.5	5.1	161	0.5	<2	13	NA	13	1120	12.1	378	<0.2	270	9	0.28	96.6	0.25	3.37	122
C22-5-7	5	7		7/29/2008	<1	2.2	234	0.5	<2	10	NA	14	739	5.13	370	<0.2	5	8	0.15	95	0.26	2.45	85
E24-0-1	0	1		7/29/2008	0.6	5	149	0.8	<2	10	NA	9	2270	26.5	364	0.04	234	2	1.65	95	0.18	4.05	132
E24-1-3	1	3		7/29/2008	1	7.6	116	0.9	<2	11	NA	10	2470	47.9	369	<0.2	362	3	2.42	94.1	0.22	5.32	159
E24-5-7	5	7		7/29/2008	0.2	2.2	198	0.6	<2	12	NA	14	364	13.1	434	<0.2	57	10	0.32	96.4	0.38	4.07	68
G27-0-1	0	1		8/7/2008	0.3	3.5	81.2	0.5	<2	6	NA	7	2750	30.9	233	<0.2	403	5	0.8	93.4	0.2	2.8	90
G27-1-3	1	3		8/7/2008	<1	1.2	126	0.4	<2	4	NA	11	933	3.92	399	<0.2	3	7	0.07	97.1	0.29	3.7	57
H22-0-1	0	1		7/30/2008	3.7	11.7	115	0.5	1.6	8	NA	10	10000	91.3	294	0.05	821	7	4.53	92.7	0.42	3.34	293
H22-1-3	1	3		7/30/2008	0.4	3.7	70.4	0.3	1	5	NA	5	2330	15	188	<0.2	118	7	1.07	95.2	0.24	2.3	181
H22-5-7	5	7		7/31/2008	<1	1.1	199	0.5	1.7	6	NA	14	1740	3.75	594	<0.2	10	14	0.06	94.8	0.51	3.75	464
K24-0-1	0	1		7/31/2008	<1	3	78.7	0.8	<2	7	NA	8	629	15.9	175	<0.2	66	6	0.52	95.7	0.28	2.5	46
K24-1-3	1	3		7/31/2008	0.2	2.5	79.4	0.6	<2	8	NA	5	530	13.1	124	<0.2	19	6	0.21	95.4	0.26	3.16	47
K24-5-7	5	7		7/31/2008	<1	2.4	152	0.6	<2	6	NA	8	486	12.3	241	<0.2	24	7	0.27	94.8	0.25	2.89	45
M26-0-1	0	1		8/1/2008	<1	2.6	126	<1	<2	7	NA	5	358	21.9	146	<0.2	66	5	0.35	94.3	<0.18	3.13	57
M26-1-3	1	3		8/1/2008	0.3	3.7	48.4	0.4	<2	8	NA	4	469	20.3	109	<0.2	23	5	0.28	93	<0.16	5.3	97
M26-5-7	5	7		8/1/2008	0.2	4.6	67.5	0.7	0.5	10	NA	6	536	19.5	144	<0.2	44	7	0.16	91.9	<0.19	5.57	142
N29-0-1	0	1		8/6/2008	0.4	5.2	56	0.9	<2	9	NA	6	495	25.8	194	<0.2	124	3	0.5	96.8	0.13	1.96	78
N29-1-3	1	3		8/6/2008	0.6	7.5	65.9	1.1	<2	6	NA	17	805	41.8	429	<0.2	94	3	0.79	97.3	0.13	2.7	59
P24-0-1	0	1		8/7/2008	<1	2.3	104	0.7	<2	5	NA	10	719	15	379	<0.2	60	7	0.36	98.1	0.24	4.54	82
P24-1-3	1	3		8/7/2008	<1	2.6	79.9	0.5	<2	6	NA	5	483	14.6	146	<0.2	260	4	0.48	93.5	0.17	5.44	64
P24-5-7	5	7		8/7/2008	<1	2.3	86.5	0.4	<2	8	NA	6	540	24.6	230	<0.2	106	5	0.27	95.7	0.16	3.97	89
P24-10-11	10	11		8/7/2008	<1	2.1	132	0.9	<2	3	NA	8	348	104	293	<0.2	9	8	0.14	89.1	0.28	6.46	550
X26-0-1	0	1		8/6/2008	0.4	3.2	94.8	0.6	<2	6	NA	10	1390	12.8	356	<0.2	154	5	0.52	92.5	0.3	3.78	67
X26-1-3	1	3		8/6/2008	<1	1.7	52.8	0.2	<2	5	NA	7	424	6.02	199	<0.2	51	3	0.27	98	0.14	2.38	37
X26-5-7	5	7		8/6/2008	0.5	4.5	101	0.5	<2	5	NA	7	1030	75.2	232	0.06	307	5	0.63	94.3	0.24	5.86	77

Former Evaporation Pond																							
Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
EV-JS01-0-1	0	1		7/14/2008	1.1	9.9	122	0.2	0.6	6	NA	7	3380	196	208	<0.2	547	11	3.43	92.2	0.4	4.26	100
EV-JS01-1-3	1	3		7/14/2008	0.4	5.7	213	0.4	1.6	9	NA	15	5440	73.8	402	<0.2	258	18	1.85	92.7	0.44	7.05	224
EV-JS01-5-7	5	7		7/14/2008	<1	5.5	169	0.6	6	7	NA	12	1550	12	342	<0.2	77	14	1.69	90.6	0.1	8.51	407
EV-JS02-0-1	0	1		7/14/2008	0.3	2.8	105	0.2	<2	4	NA	9	2020	19.1	330	<0.2	67	14	0.47	93.2	0.1	2.87	124
EV-JS02-1-3	1	3		7/14/2008	<1	1.1	96.2	<1	<2	7	NA	10	583	1.59	357	<0.2	11	13	1.02	96.9	0.12	4.14	54
EV-JS02-5-7	5	7		7/14/2008	<1	3.5	142	<1	<2	20	NA	9	890	11.3	394	<0.2	37	17	0.46	94.4	0.14	5.53	77

Former Laydown Yard

Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
EM-JS02-0-1	0	1		8/1/2008	0.4	5.1	115	0.7	0.9	7	NA	9	2160	187	566	0.11	382	9	0.55	96.2	<0.22	6.85	531
EM-JS02-1-3	1	3		8/1/2008	<1	3.4	89.6	0.5	1.5	5	NA	6	722	576	684	<0.2	8	5	0.23	97.4	<0.17	10.2	640
EM-JS06-0-1	0	1		8/13/2008	1.5	10.3	45	0.7	<2	9	NA	18	4090	86.1	448	0.06	1180	4	3.01	93.6	0.21	6.63	161
EM-JS06-1-3	1	3		8/13/2008	1	6.5	40.2	0.4	<2	6	NA	14	1900	33.5	288	<0.2	472	2	2.58	95.9	0.19	4.13	53
EM-JS06-5-7	5	7		8/13/2008	0.9	8.1	39.2	0.5	<2	14	NA	17	2650	157	371	<0.2	309	4	2.53	92.9	0.21	5.12	110
EM-JS06-10-11	10	11		8/13/2008	2.1	15.8	142	0.9	1	22	NA	16	5870	93.3	579	0.05	481	19	1.85	90.1	0.25	18.1	283
EM-JS07-0-1	0	1		8/13/2008	1.4	11.7	96.2	0.2	0.6	12	NA	19	3770	96.4	382	0.09	6830	<5	3.68	94.2	0.27	6.01	122
EM-JS07-1-3	1	3		8/13/2008	2.3	10.7	77.8	0.7	0.7	13	NA	17	4840	151	556	0.05	1000	10	2.77	93.3	0.21	8.97	238
EM-JS07-5-7	5	7		8/13/2008	1.2	9.1	75.8	0.7	0.9	10	NA	17	3840	144	590	0.07	343	11	2.13	91.9	0.26	6.49	274
EM-JS07-10-12	10	12		8/13/2008	2.6	16.1	62.6	0.5	2	36	<4	25	5150	147	645	0.23	5610	16	3.96	94.6	0.26	9.21	393
EM-JS07-15-16	15	16		8/13/2008	2.8	17.8	118	2.1	6	45	<5	19	6910	120	475	0.13	1050	12	2.45	79.6	0.35 J	36.9 J	386
EM-JS08-0-1	0	1		8/12/2008	1.1	11.9 J	55.7	<1	<2	5	NA	4	2040	57	166	0.08	1240	<5	3.24	93.9	0.12	2.41	39
EM-JS08-1-3	1	3		8/12/2008	0.4	7.7 J	47.3	<1	<2	2	NA	5	1800	152	190	0.09	315	<5	3.38	91.5	0.2	1.17	39
EM-JS08-1-3D	1	3 Duplicate		8/12/2008	0.6	8.2 J	69.5	<1	<2	3	NA	5	1430	51.9	193	0.07	342	<5	2.85	91.4	0.17	1.29	43
EM-JS08-5-7	5	7		8/12/2008	13.6	64.8 J	150	<1	5	36 J	<9	42	26800	999	932	0.6	6470	33	7.85	88.9	0.22	5.2	1550
EM-JS08-10-12	10	12		8/12/2008	2 J	16	77.6	0.9	5.3	193	4 R	23	4120	303	683	0.4	2220	29	2.86	90.1	0.17	7.78	741

Former Raffinate Pond

Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
RA-JS01-0-1	0	1		8/7/2008	0.6	9.7	67.3	0.9	<2	5	NA	7	3550	64.7	401	0.07	955	4	1.9	83.1	0.22	4.42	133
RA-JS01-1-3	1	3		8/7/2008	0.8	16.8	99.1	2.1	<2	8	NA	13	4020	120	566	0.08	767	7	2.17	76.9	0.28	13.4	173
RA-JS01-5-7	5	7		8/7/2008	0.9	13.5	83.7	0.8	<2	6	NA	16	7520	78.6	276	<0.2	525	7	2.43	90.8	0.19	6.59	125
RA-JS02-0-1	0	1		8/11/2008	8	<35.4	74.1	<5	1.5	10	NA	17	30200	137	384	0.36	1430	2	<11.1	69.5	0.35	5.63	281
RA-JS02-0-1D	0	1	Duplicate	8/11/2008	18.1	81.6	70	<10	<20	<50	NA	30	88000	326	223	0.09	3430	10	26.3	75	0.3	3.4	540
RA-JS02-1-3	1	3		8/11/2008	17.4	<89.7	68.9	<5	2.5	18	NA	22	27800	349	327	0.28	3430	2	<9.76	65.9	0.36	8.62	466
RA-JS02-1-3D	1	3	Duplicate	8/11/2008	5.2	44.9	73.7	0.8	1.4	9	NA	14	10600	134	383	0.22	1950	6	4.77	70.6	0.35	10.5	426
RA-JS02-5-7	5	7		8/11/2008	9.6	<60	78.1	6.2	1.8	35	<8 UJ	26	19600	199	382	0.32	1950	8	<6.25	53	0.39	29.9	629
RA-JS02-5-7D	5	7	Duplicate	8/11/2008	9.2	<76	81.1	5	2	32	<7 UJ	25	18000	185	415	0.57	1960	9	<7.83	60	0.52	32.2	589
RA-JS03-0-1	0	1		8/7/2008	<1	1.7	163	0.3	<2	5	NA	7	113	4.99	239	<0.2	26	6	0.13	86.6	0.32	3.7	75
RA-JS03-1-3	1	3		8/7/2008	<1	1.1	127	<1	<2	4	NA	6	62	2.81	228	<0.2	12	6	0.05	90.4	0.26	3.33	63
RA-JS04-0-1	0	1		8/7/2008	<1	1.4	121	<1	<2	4	NA	6	201	10.8	232	<0.2	13	5	0.09	96	0.34	2.75	60
RA-JS04-1-2.5	1	2.5		8/7/2008	<1	1	98.9	<1	<2	3	NA	5	136	3	220	<0.2	<5	4	0.06	96.5	0.22	3.4	51
RA-JS05-0-1	0	1		8/7/2008	0.4	5.2	52.2	0.4	<2	2	NA	4	380	24.5	169	<0.2	157	3	0.33	88.2	0.14	6.88	82
RA-JS05-1-3	1	3		8/7/2008	0.6	3.1	53.5	<1	<2	2	NA	5	284	8.63	210	<0.2	25	3	0.15	92.2	0.15	8.31	87
RA-SD01-0-1.5	0	1.5		8/11/2008	1.3	<10.1	73.1	0.7	<2	11	NA	6	7630	86.9	277	0.09	998	2	2.61	72.8	0.2	7.72	91
RA-SD01-0-1.5D	0	1.5	Duplicate	8/11/2008	0.8	10.9	87.2	0.7	<2	11	NA	5	3410	57.3	344	<0.3	1160	5	3.66	73.7	0.3	4.32	110
RA-SD01-1.5-3	1.5	3		8/11/2008	4	<24.7	81.7	0.7	0.8	14	NA	10	6960	114	226	0.11	1590	2	3.46	68.5	0.31	10.9	186
RA-SD01-1.5-3D	1.5	3	Duplicate	8/11/2008	3.2	21.5	77.3	0.8	<2	13	NA	6	6150	95.5	255	0.09	1090	4	3.99	68.1	0.28	9.04	150
RA-SD02-0-1.5	0	1.5		8/11/2008	5.8	<32.4	52.4	<1	<2	7	NA	4	4210	106	108	0.13	530	<5	3.13	90.3	0.18	2.12	51
RA-SD02-0-1.5D	0	1.5	Duplicate	8/11/2008	4.3	26.6	56.6	0.3	<2	4	NA	3	4240	137	115	0.09	550	2	4.12	89.2	0.31	1.63	44
RA-SD02-1.5-3	1.5	3		8/11/2008	7.4	<39.1	57.4	0.5	<2	8	NA	5	4180	91.3	181	0.13	1000	2	3.02	80.9	0.25	3.98	77
RA-SD02-1.5-3D	1.5	3	Duplicate	8/11/2008	9.4 J	55.1 J	99.6	0.7	<2	7	NA	4	4790	87.8 J	175	0.1	1430	4	4.73	80	0.29	3.58	86

Former Rhenium Ponds

Sample ID	Top depth	Bottom depth	Duplicate	Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium, Hexavalent (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Solids, Percent (%)	Thallium (mg/kg)	Uranium (mg/kg)	Zinc (mg/kg)
RP-JS01-0-1	0	1		8/12/2008	<1	3.5 J	127	0.6	<2	4	NA	5	124	11.4	271	0.07	51	2	0.91	91.2	0.15	2.64	40
RP-JS01-1-3	1	3		8/12/2008	<1	3.1 J	46.1	0.2	<2	4	NA	5	183	12.7	244	<0.2	86	2	0.8	87.8	0.13	2.44	43
RP-JS01-1-3D	1	3	Duplicate	8/12/2008	<1	3.1 J	41.8	<1	<2	4	NA	5	181	13.4	239	<0.2	66	1	0.8	89.2	0.14	2.35	42
RP-JS01-5-7	5	7		8/12/2008	<1	1.9 J	49	<1	<2	2	NA	5	137	6.43	231	<0.2	33	2	0.6	90.9	0.08	1.26	36
RP-JS01-10-12	10	12		8/12/2008	<1	2.6 J	50.8	0.3	<2	2	NA	5	466	9.69	207	0.06	126	2	1.04	85.8	0.09	2.25	48
RP-JS01-15-17	15	17		8/12/2008	0.3	3.6 J	56.8	0.3	<2	2	NA	6	254	11.3	368	<0.2	67	2	0.93	83.4	0.15	4.6	84
RP-JS02-0-1	0	1		8/12/2008	0.2	3.5 J	303	1.6	<2	7	NA	10	63	10.8	975	0.04	6	6	0.34	93.3	0.25	2.11	51
RP-JS02-1-3	1	3		8/12/2008	<1	3.5 J	47.3	<1	<2	3	NA	2	74	8.5	160	<0.2	121	<5	0.74	87.8	0.11	1.07	23
RP-JS02-1-3D	1	3	Duplicate	8/12/2008	<1	3.7 J	49.3	<1	<2	3	NA	2	81	9.53	169	0.05	109	<5	0.89	86.7	0.12	1.25	26
RP-JS02-5-7	5	7		8/12/2008	<1	5.2 J	188	0.8	<2	4	NA	10	123	7.69	1250	<0.2	32	4	0.7	86.3	0.17	2.12	71
RP-JS02-10-12	10	12		8/12/2008	0.3	3.3 J	50.9	0.5	<2	2	NA	16	323	14.5	713	0.07	93	5	0.93	88.4	0.12	9.12	139
RP-JS02-15-17	15	17		8/12/2008	0.2	3.1 J	47.5	0.2	<2	2	NA	7	289	14.7	386	<0.2	51	2	0.84	83.2	0.15	4.35	64



RESUBMISSION

Gamma Spectroscopy

Case Narrative

Freeport McMoRan Sierrita

FMI-VRP

Work Order Number: 0812177


1. The following report consists of analytical results and supporting documentation for 19 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedure SOP739R9. Samples 0812177-2, -2DUP, -3, -5, -6, -7, -10, and -16 were sealed in steel cans on 12/24/08 and stored for at least 21 days to allow ^{222}Rn to approach equilibrium with its progeny. The degree of in-growth achieved prior to analysis on 01/15/09 is at least 97.8%. Conservatively assuming a radon emanation efficiency of approximately 50%, the effective radon progeny in-growth for these samples would be greater than 98.9%. The remaining samples in the work order were packed in standard 100 gram geometry and analyzed for ^{228}Ra only.
3. The samples were analyzed for the presence of gamma emitting radionuclides according to procedure SOP713R10. The analyses were completed on 01/15/09.
4. The results for these samples are reported on a "Dry Weight" basis in units of pCi/gram.
5. Sample volumes were insufficient to allow preparation of duplicates. A duplicate analysis of sample 0812177-2 was performed in lieu of a prepared duplicate.
6. ALS Paragon has observed a reproducible low bias in ^{226}Ra results (about -30% for the geometry in question) when using a mixed gamma source for the calibration of HPGe detectors for solid samples. This bias is eliminated by calibration using a NIST traceable ^{226}Ra source in the same geometry and configuration as the samples.
7. The library used for calibration and analysis for samples 0812177-2, -2DUP, -3, -5, -6, -7, -10, and -16 employs multiple peaks for the ^{226}Ra progeny, ^{214}Pb (352 and 295 keV) and ^{214}Bi (609 and 1120 keV). Using these peaks avoids the use of the problematic ^{226}Ra photo-peak at 186 keV, which suffers from poorly resolvable interference from ^{235}U at the same energy. Final activity results for ^{226}Ra are calculated, using the uncertainty-weighted mean of the activities for the four photo-peaks, by the Seeker gamma spectroscopy software assuming secular



equilibrium.

8. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above the critical level, or the minimum library peak abundance must be attained. Nuclides not meeting these requirements have been flagged with a "T1" qualifier.
9. There are cases where the sample density is less than the associated calibration standard density. Cases that exceed the limit of +/- 15% of the density of the calibration standard are flagged with a 'G', denoting a significant density difference between the sample and calibration standard. Consequently, the results may be biased high for the flagged results in this work order. If requested, ALS Paragon can perform a transmission spike in order to estimate a magnitude of this bias. The results are reported without further qualification.
10. Due to the nature of electronics involved in gamma spectroscopy, any detector acquiring data with the same multi-channel buffer (MCB) is affected by all other detector inputs in that same MCB. A high activity calibration source was counting in detector 4, which is in the same MCB as detector 3. GS090106-3LCS was counted in detector 3 on 01/13/09. Thus, the observed dead time for this sample count was greater than 10% at 10.63%. Analyst review of the data does not indicate a problem with the spectral acquisition for this sample. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. Results are submitted without further qualification. Please refer to QASS 360430.
11. The requested detection limit of 1 pCi/gram for ^{228}Ra was not met for samples 0812177-3, -7, -9, -11, -14, -15, and -17, as identified with an "M3" qualifier on the final reports. The reported activity for these samples is greater than the achieved detection limit. Results are submitted without further qualification.
1. No further problems were encountered with either the client samples or the associated quality control samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Jean Anderson
Radiochemistry Primary Data Reviewer

12/04/12
Date


Radiochemistry Final Data Reviewer

12-4-12
Date



Section 1

CHAIN OF CUSTODY

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812177

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-SD-01-0-1.5	0812177-1		SOIL	16-Jul-08	8:30
CP-SD-01-1.5-3.0	0812177-2		SOIL	16-Jul-08	8:30
CP-SD-02-0-1.5	0812177-3		SOIL	16-Jul-08	9:08
CP-SD-02-1.5-3.0	0812177-4		SOIL	16-Jul-08	9:08
CP-SD-06-0-1.5	0812177-5		SOIL	16-Jul-08	9:26
CP-SD-06-1.5-3.0	0812177-6		SOIL	16-Jul-08	9:26
CP-SD-05-0-1.5	0812177-7		SOIL	16-Jul-08	9:45
CP-SD-05-1.5-3.0	0812177-8		SOIL	16-Jul-08	9:45
CP-SD-03-0-1.5	0812177-9		SOIL	16-Jul-08	9:54
CP-SD-03-1.5-3.0	0812177-10		SOIL	16-Jul-08	9:54
CP-P07-1-3	0812177-11		SOIL	17-Jul-08	14:04
CP-P07-0-1	0812177-12		SOIL	17-Jul-08	14:04
CP-P07-5-7	0812177-13		SOIL	17-Jul-08	14:11
CP-SD-04-0-1.5	0812177-14		SOIL	17-Jul-08	14:52
CP-SD-04-1.5-3.0	0812177-15		SOIL	17-Jul-08	14:52
CP-Q09-1-3	0812177-16		SOIL	23-Jul-08	10:15
CP-SD-09-0-1.5	0812177-17		SOIL	28-Jul-08	10:39
CD-SD-09-1.5-3.0	0812177-18		SOIL	28-Jul-08	10:39
CP-P12-1-3	0812177-19		SOIL	23-Jul-08	11:03
OD-SD-02-0-1.5	0812177-20		SOIL	28-Jul-08	11:11



**PARAGON
ANALYTICS**

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 1 of 2

Project Name/No.: FMI-VIRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: Date 12/15/08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: Steven.Vaughn@paragoncorp.com

Company: Freeport McMoran

Address: Green Valley, AZ 85614

6200 W Duval Ave Rd.

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-SD-01-0-1.5	7/16/08	830	①	S	n/a	1
CP-SD-01-1.5-3.0	7/16/08	830	②	S	n/a	1
CP-SD-02-0-1.5	7/16/08	908	③	S	n/a	1
CP-SD-02-1.5-3.0	7/16/08	908	④	S	n/a	1
CP-SD-06-0-1.5	7/16/08	926	⑤	S	n/a	1
CP-SD-06-1.5-3.0	7/16/08	926	⑥	S	n/a	1
CP-SD-05-0-1.5	7/16/08	945	⑦	S	n/a	1
CP-SD-05-1.5-3.0	7/16/08	945	⑧	S	n/a	1
CP-SD-03-0-1.5	7/16/08	954	⑨	S	n/a	1
CP-SD-03-1.5-3.0	7/16/08	954	⑩	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter		Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K. Walsh</u>		Signature _____		Signature _____	
Printed Name <u>Kevin Walsh</u>		Printed Name _____		Printed Name _____	
Date <u>12/15/08</u>		Date _____		Date _____	
Time <u>1600</u>		Time _____		Time _____	
Company <u>URS</u>		Company _____		Company _____	
Received By: <u>Cheryl Trimble</u>		Received By: _____		Received By: _____	
Signature _____		Signature _____		Signature _____	
Printed Name <u>Cheryl Trimble</u>		Printed Name _____		Printed Name _____	
Date <u>12-17-08</u>		Date _____		Date _____	
Time <u>1045</u>		Time _____		Time _____	
Company <u>ALS Paragon</u>		Company _____		Company _____	

Order No. 0548 VT

Trk # 7971 87199884



PARAGON
ANALYTICS

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

225 Commerce Drive Fort Collins, CO 80524
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LAB ID 0812177

Date: 12/15/08 Page 2 of 2

Project Name/No.: FMI-VRP		Sampler(s): K. Walsh		Turnaround (circle one): <u>Standard</u> or Rush (Due _____)		Dispose Date <u>60 day</u> or Return to Client _____	
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: _____ E-mail: Steven.Vaughn@urscorp.com Company: Freeport Mc Moran Address: 6200 W David (near Rd.) Green Valley, AZ 85614							
Circle method (right); provide additional information as needed (comments).							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers	
CP-P07-1-3	7/17/08	1404	11	S	N/A	1	
CP-P07-0-1	7/17/08	1404	13	S	N/A	1	
CP-P07-5-7	7/17/08	1411	13	S	N/A	1	
CP-SD-04-0-1.5	7/17/08	1452	14	S	N/A	1	
CP-SD-04-1.5-3.0	7/17/08	1452	15	S	N/A	1	
CP-C09-1-3	7/23/08	1015	16	S	N/A	1	
CP-SD-09-0-1.5	7/23/08	1034	17	S	N/A	1	
CP-SD-09-1.5-3.0	7/23/08	1039	18	S	N/A	1	
CP-P12-1-3	7/23/08	1103	19	S	N/A	1	
OD-SD-02-0-1.5	7/23/08	1111	20	S	N/A	1	
* Time Zone: EST CST MST PST		Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter					
Comments:							
Order No. 0508VT							
Trk # 7971 87199884							
Relinquished By: <u>K. Walsh</u>		Signature _____		Printed Name _____		Date _____ Time _____	
(1)		Company _____		Company _____		Company _____	
Relinquished By: <u>Cheryl Trimble</u>		Signature _____		Printed Name _____		Date _____ Time _____	
(1)		Company _____		Company _____		Company _____	
Relinquished By: <u>Cheryl Trimble</u>		Signature _____		Printed Name _____		Date _____ Time _____	
(1)		Company _____		Company _____		Company _____	
Form 2026.xls (6/16/06)							

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812177Project Manager: JEInitials: COTDate: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO / NA (If no. see Form 008.)		

DOT
Survey/
Acceptance
Information

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO ☒ NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE 12/20/08

*IR Gun #2: Oakton, SN 29922500201-0066

IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/20/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

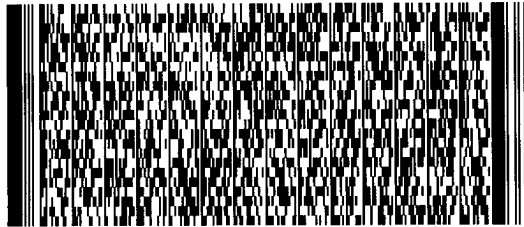
Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #



LL1E180

1-7/1

4 of 4 WED - 17DEC AA
STANDARD OVERNIGHT

MPS# 7971 8719 9884

0263

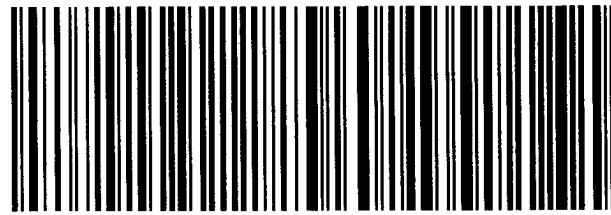
Mstr# 7971 8719 9690 0201

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Section 2



SAMPLE RESULTS SUMMARY



Due to the nature of gamma spectroscopy data, a summary report is not provided.

Please refer to the individual sample results in Section 4.



Section 3

QC RESULTS SUMMARY



Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 45 minutes

Final Aliquot: 94.1 g

Result Units: pCi/g

File Name: 090060d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	0.20 +/- 0.34	0.59	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3MB

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 195 g

Result Units: pCi/g

File Name: 090052d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.093 +/- 0.20	0.34	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3MB

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 195 g

Result Units: pCi/g

File Name: 090052d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-0.17 +/- 0.37	0.76	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 half-lives.
M - Requested MDC not met.
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090106-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 31-Dec-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Final Aliquot: 100 g

Result Units: pCi/g

File Name: 090067d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	1020 +/- 120	14.2	986	103	85 - 115	P
10198-40-0	Co-60	454 +/- 53.2	1.41	457	99.3	85 - 115	P
10045-97-3	Cs-137	404 +/- 47.4	1.87	374	108	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812177-1

Date Printed: Thursday, February 05, 2009

ALS Paragon

LIMS Version: 6.242A

Page 1 of 3

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3ALCS

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090086d02

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	451 +/- 52.9	2.97	470	96.0	85 - 115	P,M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: GS090109-3LCS

Library: ANALYTICAL

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 24-Dec-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Final Aliquot: 215 g

Result Units: pCi/g

File Name: 090097d03

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
14596-10-2	Am-241	486 +/- 58.1	12.4	462	105	85 - 115	P
10198-40-0	Co-60	213 +/- 25.0	0.839	214	99.3	85 - 115	P
10045-97-3	Cs-137	177 +/- 20.8	1.22	175	101	85 - 115	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090045d08A

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.2 +/- 0.39	2.3 +/- 0.41	0.23	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090045d08

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	2.4 +/- 0.57	2.5 +/- 0.58	0.10	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3
Lab ID: 0812177-19DUP

Library: Ra-228

Sample Matrix: SOIL
Prep SOP: PAI 739 Rev 9
Date Collected: 23-Jul-08
Date Prepared: 31-Dec-08
Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3
QCBatchID: GS090106-3-1
Run ID: GS090106-3A
Count Time: 45 minutes
Report Basis: Dry Weight

Final Aliquot: 91.5 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: 090066d03

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
15262-20-1	Ra-228	1.9 +/- 0.67	1.2 +/- 0.45	0.80	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1



Section 4

INDIVIDUAL SAMPLE RESULTS

4

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5

Lab ID: 0812177-1

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 96.0 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090017d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.50	0.96	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090077d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.2 +/- 0.39	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090077d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.4 +/- 0.57	0.78	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090045d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.41	0.47	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 202 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090045d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.5 +/- 0.58	0.67	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-02-0-1.5
Lab ID:	0812177-3

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 188 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.34	0.54	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-0-1.5

Lab ID: 0812177-3

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 188 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090088d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.58	1.0	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-02-1.5-3.0

Lab ID: 0812177-4

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090054d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.66	0.95	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-0-1.5

Lab ID: 0812177-5

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.44	0.49	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-0-1.5

Lab ID: 0812177-5

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090078d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.59	0.91	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-06-1.5-3.0
Lab ID:	0812177-6

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 208 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.49	0.51	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-06-1.5-3.0

Lab ID: 0812177-6

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 208 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090089d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.6 +/- 0.65	0.92	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-0-1.5

Lab ID: 0812177-7

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 186 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d02A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.7 +/- 0.46	0.54	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-0-1.5

Lab ID: 0812177-7

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 186 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d02

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.56	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-1.5-3.0

Lab ID: 0812177-8

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 109 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090060d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.1 +/- 0.62	0.96	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-0-1.5

Lab ID: 0812177-9

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 104 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090061d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.5 +/- 0.61	1.0	1	M3,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-1.5-3.0

Lab ID: 0812177-10

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090090d03A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.42	0.45	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-1.5-3.0

Lab ID: 0812177-10

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 16-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 207 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090090d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.59	0.78	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-1-3

Lab ID: 0812177-11

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 81.9 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090079d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.8 +/- 0.78	1.3	1	M3,G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-0-1

Lab ID: 0812177-12

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 83.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090018d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.8 +/- 0.69	0.90	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-0-1.5

Lab ID: 0812177-14

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 85.3 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090055d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.81	1.6	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-04-1.5-3.0

Lab ID: 0812177-15

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 17-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 84.8 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090062d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.3 +/- 0.84	1.5	1	M3,G,TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-Q09-1-3

Lab ID: 0812177-16

Library: Ra-226

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090046d08A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.35	0.44	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-Q09-1-3

Lab ID: 0812177-16

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 24-Dec-08

Date Analyzed: 15-Jan-09

Prep Batch: GS090109-3

QCBatchID: GS090109-3-1

Run ID: GS090109-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 203 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090046d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.8 +/- 0.54	0.69	1	TI

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5	Sample Matrix: SOIL	Prep Batch: GS090106-3	Final Aliquot: 88.5 g
Lab ID: 0812177-17	Prep SOP: PAI 739 Rev 9	QCBatchID: GS090106-3-1	Prep Basis: Dry Weight
Library: Ra-228	Date Collected: 28-Jul-08	Run ID: GS090106-3A	Moisture(%): NA
	Date Prepared: 31-Dec-08	Count Time: 30 minutes	Result Units: pCi/g
	Date Analyzed: 12-Jan-09	Report Basis: Dry Weight	File Name: 090080d06

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.0 +/- 0.59	1.0	1	M3

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CD-SD-09-1.5-3.0

Lab ID: 0812177-18

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 109 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090019d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.4 +/- 0.45	0.79	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3

Lab ID: 0812177-19

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 12-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 78.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090056d09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.9 +/- 0.67	1.0	1	G

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P12-1-3

Lab ID: 0812177-19DUP

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 23-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 45 minutes

Report Basis: Dry Weight

Final Aliquot: 91.5 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090066d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	1.2 +/- 0.45	0.83	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halfives.

G - Sample density differs by more than 15% of LCS density.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: GSS0812177-1

Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5

Lab ID: 0812177-20

Library: Ra-228

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 28-Jul-08

Date Prepared: 31-Dec-08

Date Analyzed: 13-Jan-09

Prep Batch: GS090106-3

QCBatchID: GS090106-3-1

Run ID: GS090106-3A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 101 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 090023d08

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	2.7 +/- 0.62	0.85	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 half-lives.

G - Sample density differs by more than 15% of LCS density.

Data Package ID: GSS0812177-1



Section 5

RAW DATA

5

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-1 GS090106-3

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Sampling Start:   07/16/2008 12:00:00 | Counting Start:   01/12/2009 14:37:09
Sampling Stop:    07/16/2008 12:00:00 | Decay Time. . . . . 4.32E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 9.60E+001 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090017D08.SPC
-----

```

Detector #: 8 (Detector 8)

Energy(keV)= -1.42 + 0.500*Ch + 1.93E-07*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.61	96.06	32	22	16	56	0.62	a
2	63.36	129.56	39	22	15	57	0.41	a
3	74.94	152.72	126	31	18	72	0.69	a
4	77.22	157.27	203	36	18	72	0.65	b
5	87.25	177.33	62	29	21	78	1.00	a
6	90.12	183.07	45	28	21	78	1.01	b
7	93.00	188.83	83	33	23	91	1.12	c
8	129.19	261.19	19	14	9	22	0.43	a
9	186.13	375.03	44	27	19	57	1.26	a
10	238.66	480.06	192	35	18	66	0.74	a
11	270.16	543.03	29	20	14	34	0.95	a
12	295.23	593.17	59	20	11	23	0.84	a
13	338.46	679.58	38	17	10	19	0.77	a
14	351.97	706.57	125	27	13	29	1.04	a
15	510.93	1024.27	40	19	12	24	1.49	a
16	583.57	1169.44	65	21	12	23	1.59	a
17	609.39	1221.02	71	23	13	29	1.30	a
18	911.26	1824.04	36	16	9	15	1.53	a
19	968.84	1939.02	18	12	7	13	1.03	a
20	1461.03	2921.55	173	26	3	2	1.71	a

090017D08.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.61	32	22	16	20	23	17	
2	63.36	39	22	15	25	23	17	
3	74.94	126	31	18	117	32	19	
4	77.22	203	36	18	197	36	19	
5	87.25	62	29	21	59	30	21	
7	93.00	83	33	23	57	34	25	
9	186.13	44	27	19	33	27	20	
10	238.66	192	35	18	183	36	19	
12	295.23	59	20	11	57	20	11	
14	351.97	125	27	13	120	27	13	
15	510.93	40	19	12	-8	20	17	NET<CL
16	583.57	65	21	12	61	22	12	
17	609.39	71	23	13	68	23	13	
18	911.26	36	16	9	34	16	9	
19	968.84	18	12	7	16	12	8	
20	1461.03	173	26	3	167	27	5	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-1 GS090106-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/12/2009 14:37:09
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.32e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 9.60e+001 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090017D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh11).EFF (Geo 11 Eff Cal)

Eff=10[^][-7.60E+00 +6.54E+00*L + -1.66E+00*L[^]2 +0.00E+00*L[^]3] 10/07/2008
 Eff.=10[^][-2.70E+00 +2.85E+00*L + -1.33E+00*L[^]2 +1.56E-01*L[^]3] Above 180.00 keV

Library File: RA228.LIB (Ra-228)

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	1.54E+00 +- 4.64E-01	. . . . .	. . . . .	5.04E+04
	338.40	1.62E+00 +- 7.30E-01	9.56E-01	4.20E-01	5.04E+04
	911.07	1.59E+00 +- 7.56E-01	9.95E-01	4.35E-01	5.04E+04
	968.90	1.31E+00 +- 9.88E-01	1.45E+00	6.17E-01	5.04E+04

MEASURED TOTAL: 1.54E+00 +- 4.64E-01 pCi/g

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UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.61	96.06	20	23	17	56	0.62	Unknown
2	63.36	129.55	25	23	17	57	0.41	Unknown
3	74.94	152.72	117	32	19	72	0.69	Unknown
4	77.22	157.27	197	36	19	72	0.65	Unknown
5	87.25	177.33	59	30	21	78	1.00	Unknown
6	90.12	183.07	45	28	21	78	1.01	Unknown
7	93.00	188.83	57	34	25	91	1.12	Unknown
8	129.19	261.19	19	14	9	22	0.43	Unknown
9	186.13	375.03	33	27	20	57	1.26	Unknown
10	238.66	480.06	183	36	19	66	0.74	Unknown
11	270.16	543.03	29	20	14	34	0.95	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	295.23	593.17	57	20	11	23	0.84	Unknown
14	351.97	706.57	120	27	13	29	1.04	Unknown
15	510.93	1024.27	-8	20	17	24	1.49	Deleted
16	583.58	1169.44	61	22	12	23	1.59	Unknown
17	609.39	1221.02	68	23	13	29	1.30	Unknown
20	1461.03	2921.55	167	27	5	2	1.71	Unknown

c:\SEEKER\BIN\090017d08.res Analysis Results Saved.

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-2 GS090109-3

 Sampling Start: 07/16/2008 12:00:00 Counting Start: 01/15/2009 07:36:34
 Sampling Stop: 07/16/2008 12:00:00 Decay Time. 4.39E+003 Hrs
 Buildup Time. 0.00E+000 Hrs Live Time 1800 Sec
 Sample Size 2.03E+002 g Real Time 1802 Sec
 Collection Efficiency 1.0000 Spc. File 090077D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -0.62 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009
 FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.81	150.74	73	27	17	67	0.73	a
2	76.98	155.06	125	33	20	84	0.78	b
3	87.14	175.37	44	28	20	89	0.69	a
4	129.09	259.22	26	32	25	107	1.15	a
5	185.94	372.81	44	28	20	76	0.97	a
6	238.58	478.02	357	44	19	65	1.01	a
7	241.69	484.24	63	35	26	98	1.48	b
8	295.17	591.11	112	28	15	41	1.17	a
9	327.90	656.51	17	14	10	21	0.66	a
10	338.17	677.04	70	24	14	35	1.20	a
11	351.85	704.36	166	30	13	29	1.06	a
12	462.97	926.43	19	15	10	21	0.75	a
13	511.23	1022.87	93	31	20	51	2.48	a Wide Pk
14	583.15	1166.61	100	24	10	18	1.54	a
15	609.46	1219.17	113	26	13	26	1.74	a
16	911.29	1822.36	67	20	9	17	1.78	a
17	969.27	1938.22	37	17	10	22	1.59	a
18	1460.77	2920.43	227	31	6	7	2.59	a

090077D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET020109.BKG (090109-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.81	73	27	17	63	29	20	
2	76.98	125	33	20	118	34	21	
5	185.94	44	28	20	37	28	21	
6	238.58	357	44	19	348	44	20	
7	241.69	63	35	26	61	35	26	
8	295.17	112	28	15	108	29	16	
10	338.17	70	24	14	69	24	15	
11	351.85	166	30	13	159	30	14	
13	511.23	93	31	20	46	32	24	
14	583.15	100	24	10	96	24	11	
15	609.46	113	26	13	109	27	14	
16	911.29	67	20	9	65	20	10	
18	1460.77	227	31	6	221	31	8	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-2 GS090109-3

 Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 07:36:34
 Sampling Stop: 07/16/2008 12:00:00 | Decay Time: 4.39e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 2.03e+002 g | Real Time 1802 Sec
 Collection Efficiency 1.0000 | Spectrum File 090077D02.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02) (Sh17).EFF (Geo 17 Eff Cal)

Eff.=1/[1.07E-03*En^-4.23E+00 + 1.25E+02*En^7.56E-01] 05/21/2008

 Library File: RA228.LIB (Ra-228)
 =====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average: x	2.41E+00 +- 5.00E-01	. . . . .	. . . . .	5.04E+04
	338.40	2.66E+00 +- 9.39E-01	1.24E+00	5.66E-01	5.04E+04
	911.07	2.32E+00 +- 7.09E-01	7.80E-01	3.42E-01	5.04E+04
	968.90	2.27E+00 +- 1.06E+00	1.43E+00	6.32E-01	5.04E+04

MEASURED TOTAL: 2.41E+00 +- 5.00E-01 pCi/g

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UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.81	150.74	63	29	20	67	0.73	Unknown
2	76.98	155.06 <i>Pb-214</i>	118	34	21	84	0.78	Unknown
3	87.14	175.37	44	28	20	89	0.69	Unknown
4	129.09	259.22	26	32	25	107	1.15	Unknown
5	185.94	372.81	37	28	21	76	0.97	Unknown
6	238.58	478.02 <i>Pb-212</i>	348	44	20	65	1.01	Unknown
7	241.69	484.24	61	35	26	98	1.48	Unknown
8	295.17	591.11	108	29	16	41	1.17	Unknown
9	327.90	656.51	17	14	10	21	0.66	Unknown
11	351.85	704.36 <i>Pb-214</i>	159	30	14	29	1.06	Unknown
12	462.97	926.43	19	15	10	21	0.75	Unknown
13	511.23	1022.87	46	32	24	51	2.48	Unknown

090077D02.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	583.15	1166.61 <i>Tl-208</i>	96	24	11	18	1.54	Unknown
15	609.46	1219.17 <i>Bi-214</i>	109	27	14	26	1.74	Unknown
18	1460.77	2920.43 <i>K-40</i>	221	31	8	7	2.59	Unknown

c:\SEEKER\BIN\090077d02.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 17/26

Sample ID: 0812177-2 GS090109-3

Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 07:36:34
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. 4.39E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
Sample Size 2.03E+002 g | Real Time 1802 Sec
Collection Efficiency 1.0000 | Spc. File 090077D02.SPC

Detector #: 2 (Detector 2)

Energy(keV) = -0.62 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.81	150.74	73	27	17	67	0.73	a
2	76.98	155.06	125	33	20	84	0.78	b
3	87.14	175.37	44	28	20	89	0.69	a
4	129.09	259.22	26	32	25	107	1.15	a
5	185.94	372.81	44	28	20	76	0.97	a
6	238.58	478.02	357	44	19	65	1.01	a
7	241.69	484.24	63	35	26	98	1.48	b
8	295.17	591.11	112	28	15	41	1.17	a
9	327.90	656.51	17	14	10	21	0.66	a
10	338.17	677.04	70	24	14	35	1.20	a
11	351.85	704.36	166	30	13	29	1.06	a
12	462.97	926.43	19	15	10	21	0.75	a
13	511.23	1022.87	93	31	20	51	2.48	a Wide Pk
14	583.15	1166.61	100	24	10	18	1.54	a
15	609.46	1219.17	113	26	13	26	1.74	a
16	911.29	1822.36	67	20	9	17	1.78	a
17	969.27	1938.22	37	17	10	22	1.59	a
18	1460.77	2920.43	227	31	6	7	2.59	a

090077D02.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET020109.BKG (090109-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.81	73	27	17	63	29	20	
2	76.98	125	33	20	118	34	21	
5	185.94	44	28	20	37	28	21	
6	238.58	357	44	19	348	44	20	
7	241.69	63	35	26	61	35	26	
8	295.17	112	28	15	108	29	16	
10	338.17	70	24	14	69	24	15	
11	351.85	166	30	13	159	30	14	
13	511.23	93	31	20	46	32	24	
14	583.15	100	24	10	96	24	11	
15	609.46	113	26	13	109	27	14	
16	911.29	67	20	9	65	20	10	
18	1460.77	227	31	6	221	31	8	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-2 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 07:36:34
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.03e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090077D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 2 (Detector 2)

Efficiency File: (D02) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 05/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-226	Average: x	2.19E+00 +- 2.88E-01	. . . . .	. . . . .	1.40E+07
	295.21	2.54E+00 +- 6.72E-01	8.26E-01	3.81E-01	1.40E+07
	351.92	2.20E+00 +- 4.19E-01	4.22E-01	1.92E-01	1.40E+07
	609.31	2.00E+00 +- 4.89E-01	5.52E-01	2.51E-01	1.40E+07

MEASURED TOTAL: 2.19E+00 +- 2.88E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.81	150.74	63	29	20	67	0.73	Unknown
2	76.98	155.06	118	34	21	84	0.78	Unknown
3	87.14	175.37	44	28	20	89	0.69	Unknown
4	129.09	259.22	26	32	25	107	1.15	Unknown
5	185.94	372.81	37	28	21	76	0.97	Unknown
6	238.58	478.02	348	44	20	65	1.01	Unknown
7	241.69	484.24	61	35	26	98	1.48	Unknown
9	327.90	656.51	17	14	10	21	0.66	Unknown
10	338.17	677.04	69	24	15	35	1.20	Unknown
12	462.97	926.43	19	15	10	21	0.75	Unknown
13	511.23	1022.87	46	32	24	51	2.48	Unknown
14	583.15	1166.61	96	24	11	18	1.54	Unknown

090077D02.SPC Analyzed by

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UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
16	911.29	1822.36	65	20	10	17	1.78	Unknown
17	969.27	1938.22	37	17	10	22	1.59	Unknown
18	1460.77	2920.43	221	31	8	7	2.59	Unknown

c:\SEEKER\BIN\090077d02A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-2D GS090109-3

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Sampling Start:   07/16/2008 12:00:00 | Counting Start:   01/15/2009 08:41:34
Sampling Stop:    07/16/2008 12:00:00 | Decay Time. . . . . 4.39E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.03E+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090045D08.SPC
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Detector #: 8 (Detector 8)

Energy(keV) = -1.55 + 0.500*Ch + 1.69E-07*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.28	95.67	30	19	12	38	0.53	a
2	63.34	129.80	40	30	22	99	0.83	a
3	74.74	152.60	169	39	24	117	0.79	a
4	77.08	157.29	218	42	24	117	0.82	b
5	87.31	177.74	50	30	22	96	0.75	a Wide Pk
6	89.90	182.93	31	29	22	96	0.82	b
7	93.04	189.20	64	41	31	153	1.24	c
8	186.02	375.18	58	30	22	73	1.24	a
9	209.12	421.37	44	25	18	57	0.97	a
10	238.59	480.30	314	42	18	59	1.04	a
11	241.43	485.98	80	35	24	89	1.50	b
12	295.18	593.45	90	27	15	41	1.14	a
13	299.94	602.98	20	19	14	35	0.99	b
14	327.92	658.92	22	20	15	39	0.91	a
15	338.24	679.55	49	22	14	35	1.17	a
16	351.87	706.82	165	30	13	33	0.98	a
17	510.79	1024.54	55	26	18	51	1.67	a
18	583.24	1169.35	95	24	11	24	1.34	a
19	609.33	1221.49	116	27	14	34	1.48	a
20	727.48	1457.63	14	10	6	8	0.71	a
21	911.08	1824.49	77	19	7	9	1.30	a
22	969.05	1940.30	37	15	8	14	1.04	a
23	1460.74	2922.26	196	28	4	3	1.94	a

090045D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.28	30	19	12	17	19	14	
2	63.34	40	30	22	26	30	23	
3	74.74	169	39	24	160	39	25	
4	77.08	218	42	24	212	42	25	
5	87.31	50	30	22	47	30	22	
7	93.04	64	41	31	37	41	33	
8	186.02	58	30	22	47	31	23	
10	238.59	314	42	18	304	42	19	
11	241.43	80	35	24	79	35	25	
12	295.18	90	27	15	88	27	16	
14	327.92	22	20	15	21	20	15	
16	351.87	165	30	13	161	31	14	
17	510.79	55	26	18	7	27	22	NET<CL
18	583.24	95	24	11	92	24	12	
19	609.33	116	27	14	113	28	14	
21	911.08	77	19	7	76	19	7	
22	969.05	37	15	8	36	16	8	
23	1460.74	196	28	4	190	29	6	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-2D GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:34
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.03e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090045D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 8 (Detector 8)

Efficiency File: (D08) (Sh17).EFF (Geo 17 Eff Cal)

Eff=10^{[-9.46E+00 +7.81E+00*L + -1.91E+00*L² +0.00E+00*L³] 12/10/2008}

Eff.=10^{[4.36E-01 + -9.02E-01*L +1.54E-02*L² + -2.81E-04*L³] Above 180.00 keV}

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	2.49E+00 +- 5.02E-01	. . . . .	. . . . .	5.04E+04
	338.40	1.92E+00 +- 8.78E-01	1.24E+00	5.65E-01	5.04E+04
	911.07	2.95E+00 +- 7.57E-01	6.73E-01	2.84E-01	5.04E+04
	968.90	2.43E+00 +- 1.04E+00	1.28E+00	5.51E-01	5.04E+04

MEASURED TOTAL: 2.49E+00 +- 5.02E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.28	95.67	17	19	14	38	0.53	Unknown
2	63.34	129.80	26	30	23	99	0.83	Unknown
3	74.74	152.60 <i>152.60</i>	160	39	25	117	0.79	Unknown
4	77.08	157.29 <i>157.29</i>	212	42	25	117	0.82	Unknown
5	87.31	177.74	47	30	22	96	0.75	Unknown
6	89.90	182.93	31	29	22	96	0.82	Unknown
7	93.04	189.20	37	41	33	153	1.24	Unknown
8	186.02	375.18	47	31	23	73	1.24	Unknown
9	209.12	421.37	44	25	18	57	0.97	Unknown
10	238.59	480.30 <i>480.30</i>	304	42	19	59	1.04	Unknown
11	241.43	485.98	79	35	25	89	1.50	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	295.18	593.45 <i>Pb-214</i>	88	27	16	41	1.14	Unknown
13	299.94	602.98	20	19	14	35	0.99	Unknown
14	327.92	658.92	21	20	15	39	0.91	Unknown
16	351.87	706.82	161	31	14	33	0.98	Unknown
17	510.79	1024.54	7	27	22	51	1.67	Deleted
18	583.24	1169.35	92	24	12	24	1.34	Unknown
19	609.33	1221.49	113	28	14	34	1.48	Unknown
20	727.48	1457.63	14	10	6	8	0.71	Unknown
23	1460.74	2922.26	190	29	6	3	1.94	Unknown

c:\SEEKER\BIN\090045d08.res Analysis Results Saved.

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-2D GS090109-3

 Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:34
 Sampling Stop: 07/16/2008 12:00:00 | Decay Time. 4.39E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
 Sample Size 2.03E+002 g | Real Time 1802 Sec
 Collection Efficiency 1.0000 | Spc. File 090045D08.SPC

Detector #: 8 (Detector 8)

Energy(keV)= -1.55 + 0.500*Ch + 1.69E-07*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

=====

PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.28	95.67	30	19	12	38	0.53	a
2	63.34	129.80	40	30	22	99	0.83	a
3	74.74	152.60	169	39	24	117	0.79	a
4	77.08	157.29	218	42	24	117	0.82	b
5	87.31	177.74	50	30	22	96	0.75	a Wide Pk
6	89.90	182.93	31	29	22	96	0.82	b
7	93.04	189.20	64	41	31	153	1.24	c
8	186.02	375.18	58	30	22	73	1.24	a
9	209.12	421.37	44	25	18	57	0.97	a
10	238.59	480.30	314	42	18	59	1.04	a
11	241.43	485.98	80	35	24	89	1.50	b
12	295.18	593.45	90	27	15	41	1.14	a
13	299.94	602.98	20	19	14	35	0.99	b
14	327.92	658.92	22	20	15	39	0.91	a
15	338.24	679.55	49	22	14	35	1.17	a
16	351.87	706.82	165	30	13	33	0.98	a
17	510.79	1024.54	55	26	18	51	1.67	a
18	583.24	1169.35	95	24	11	24	1.34	a
19	609.33	1221.49	116	27	14	34	1.48	a
20	727.48	1457.63	14	10	6	8	0.71	a
21	911.08	1824.49	77	19	7	9	1.30	a
22	969.05	1940.30	37	15	8	14	1.04	a
23	1460.74	2922.26	196	28	4	3	1.94	a

090045D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.28	30	19	12	17	19	14	
2	63.34	40	30	22	26	30	23	
3	74.74	169	39	24	160	39	25	
4	77.08	218	42	24	212	42	25	
5	87.31	50	30	22	47	30	22	
7	93.04	64	41	31	37	41	33	
8	186.02	58	30	22	47	31	23	
10	238.59	314	42	18	304	42	19	
11	241.43	80	35	24	79	35	25	
12	295.18	90	27	15	88	27	16	
14	327.92	22	20	15	21	20	15	
16	351.87	165	30	13	161	31	14	
17	510.79	55	26	18	7	27	22	NET<CL
18	583.24	95	24	11	92	24	12	
19	609.33	116	27	14	113	28	14	
21	911.08	77	19	7	76	19	7	
22	969.05	37	15	8	36	16	8	
23	1460.74	196	28	4	190	29	6	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-2D GS090109-3

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-----
Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:34
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.03e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090045D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 8 (Detector 8)

Efficiency File: (D08) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 07/21/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average: x	2.32E+00 +- 3.13E-01	. . . . .	. . . . .	1.40E+07
	295.21	2.19E+00 +- 6.69E-01	8.59E-01	3.96E-01	1.40E+07
	351.92	2.44E+00 +- 4.63E-01	4.68E-01	2.14E-01	1.40E+07
	609.31	2.26E+00 +- 5.51E-01	6.32E-01	2.89E-01	1.40E+07

MEASURED TOTAL: 2.32E+00 +- 3.13E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.28	95.67	17	19	14	38	0.53	Unknown
2	63.34	129.80	26	30	23	99	0.83	Unknown
3	74.74	152.60	160	39	25	117	0.79	Unknown
4	77.08	157.29	212	42	25	117	0.82	Unknown
5	87.31	177.74	47	30	22	96	0.75	Unknown
6	89.90	182.93	31	29	22	96	0.82	Unknown
7	93.04	189.20	37	41	33	153	1.24	Unknown
8	186.02	375.18	47	31	23	73	1.24	Unknown
9	209.12	421.37	44	25	18	57	0.97	Unknown
10	238.59	480.30	304	42	19	59	1.04	Unknown
11	241.43	485.98	79	35	25	89	1.50	Unknown
13	299.94	602.98	20	19	14	35	0.99	Unknown

090045D08.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	327.92	658.92	21	20	15	39	0.91	Unknown
15	338.24	679.55	49	22	14	35	1.17	Unknown
17	510.79	1024.54	7	27	22	51	1.67	Deleted
18	583.24	1169.35	92	24	12	24	1.34	Unknown
20	727.48	1457.63	14	10	6	8	0.71	Unknown
21	911.08	1824.49	76	19	7	9	1.30	Unknown
22	969.05	1940.30	36	16	8	14	1.04	Unknown
23	1460.74	2922.26	190	29	6	3	1.94	Unknown

c:\SEEKER\BIN\090045d08A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-3 GS090109-3

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-----
Sampling Start:   07/16/2008 12:00:00 | Counting Start:   01/15/2009 07:36:37
Sampling Stop:    07/16/2008 12:00:00 | Decay Time. . . . . 4.39E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.88E+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090088D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV) = -1.29 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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=====
PK.   ENERGY   ADDRESS   NET/MDA   UN-      C.L.      BKG      FWHM
#     (keV)     CHANNEL   COUNTS   CERTAINTY COUNTS    COUNTS   (keV)   FLAG
-----
 1     76.92     156.15       46        28        21        86     0.77 a
 2     86.98     176.25       23        26        20        79     0.76 a
 3    186.06     374.06       37        21        14        44     0.95 a
 4    238.66     479.08      167        32        16        49     1.24 a
 5    241.89     485.52       39        25        18        55     1.41 b
 6    295.09     591.74       37        19        13        33     1.02 a
 7    338.46     678.33       27        16        10        23     0.77 a
 8    351.93     705.24      108        26        14        34     1.38 a
 9    510.93    1022.67       50        22        14        30     1.96 a
10    582.96    1166.49       57        20        11        21     1.69 a
11    609.42    1219.31       76        25        15        40     1.76 a
12    911.38    1822.20       43        20        12        22     2.22 a
13   1120.73    2240.17       18        11         6         9     0.99 a
14   1461.03    2919.61      230        32         8        11     2.46 a

```

090088D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	76.92	46	28	21	42	29	21	
3	186.06	37	21	14	29	22	15	
4	238.66	167	33	16	157	33	17	
5	241.89	39	25	18	37	25	18	
6	295.09	37	19	13	34	20	13	
7	338.46	27	16	10	25	16	10	
8	351.93	108	26	14	102	27	15	
9	510.93	50	22	14	5	23	19	NET<CL
10	582.96	57	20	11	52	20	12	
11	609.42	76	25	15	72	25	16	
12	911.38	43	20	12	41	20	12	
14	1461.03	230	32	8	225	32	9	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-3 GS090109-3

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-----
Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 07:36:37
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.88e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090088D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh17).EFF (Geo 17 Eff Cal)

Eff=10^[-3.12E+01 +2.79E+01*L + -6.55E+00*L² +0.00E+00*L³] 06/03/2008
 Eff.=1/[1.62E+00*En^{-6.17E-01} + 1.43E+02*En^{8.67E-01}] Above 180.00 keV

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:	1.40E+00 +- 5.53E-01			5.04E+04
	338.40	1.13E+00 +- 7.17E-01	1.05E+00	4.64E-01	5.04E+04
	911.07	1.80E+00 +- 8.67E-01	1.21E+00	5.43E-01	5.04E+04

MEASURED TOTAL: 1.40E+00 +- 5.53E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.92	156.15	42	29	21	86	0.77	Unknown
2	86.98	176.25	23	26	20	79	0.76	Unknown
3	186.06	374.06	29	22	15	44	0.95	Unknown
4	238.66	479.08	157	33	17	49	1.24	Unknown
5	241.89	485.52	37	25	18	55	1.41	Unknown
6	295.09	591.74	34	20	13	33	1.02	Unknown
8	351.93	705.24	102	27	15	34	1.38	Unknown
9	510.93	1022.67	5	23	19	30	1.96	Deleted
10	582.96	1166.49	52	20	12	21	1.69	Unknown
11	609.42	1219.31	72	25	16	40	1.76	Unknown
13	1120.73	2240.17	18	11	6	9	0.99	Unknown
14	1461.03	2919.61	225	32	9	11	2.46	Unknown

090088D03.SPC Analyzed by

c:\SEEKER\BIN\090088d03.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 17/26

Sample ID: 0812177-3 GS090109-3

Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 07:36:37
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. 4.39E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
Sample Size 1.88E+002 g | Real Time 1802 Sec
Collection Efficiency 1.0000 | Spc. File 090088D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.29 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.92	156.15	46	28	21	86	0.77	a
2	86.98	176.25	23	26	20	79	0.76	a
3	186.06	374.06	37	21	14	44	0.95	a
4	238.66	479.08	167	32	16	49	1.24	a
5	241.89	485.52	39	25	18	55	1.41	b
6	295.09	591.74	37	19	13	33	1.02	a
7	338.46	678.33	27	16	10	23	0.77	a
8	351.93	705.24	108	26	14	34	1.38	a
9	510.93	1022.67	50	22	14	30	1.96	a
10	582.96	1166.49	57	20	11	21	1.69	a
11	609.42	1219.31	76	25	15	40	1.76	a
12	911.38	1822.20	43	20	12	22	2.22	a
13	1120.73	2240.17	18	11	6	9	0.99	a
14	1461.03	2919.61	230	32	8	11	2.46	a

090088D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	76.92	46	28	21	42	29	21	
3	186.06	37	21	14	29	22	15	
4	238.66	167	33	16	157	33	17	
5	241.89	39	25	18	37	25	18	
6	295.09	37	19	13	34	20	13	
7	338.46	27	16	10	25	16	10	
8	351.93	108	26	14	102	27	15	
9	510.93	50	22	14	5	23	19	NET<CL
10	582.96	57	20	11	52	20	12	
11	609.42	76	25	15	72	25	16	
12	911.38	43	20	12	41	20	12	
14	1461.03	230	32	8	225	32	9	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-3 GS090109-3

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-----
Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 07:36:37
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.88e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090088D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 07/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-226	Average: x	1.51E+00 +- 2.93E-01	. . . . .	. . . . .	1.40E+07
	295.21	9.73E-01 +- 5.67E-01	8.35E-01	3.79E-01	1.40E+07
	351.92	1.74E+00 +- 4.58E-01	5.45E-01	2.49E-01	1.40E+07
	609.31	1.61E+00 +- 5.68E-01	7.58E-01	3.49E-01	1.40E+07
	1120.29	1.90E+00 +- 1.18E+00	1.55E+00	6.32E-01	1.40E+07

MEASURED TOTAL: 1.51E+00 +- 2.93E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	76.92	156.15	42	29	21	86	0.77	Unknown
2	86.98	176.25	23	26	20	79	0.76	Unknown
3	186.06	374.06	29	22	15	44	0.95	Unknown
4	238.66	479.08	157	33	17	49	1.24	Unknown
5	241.89	485.52	37	25	18	55	1.41	Unknown
7	338.46	678.33	25	16	10	23	0.77	Unknown
9	510.93	1022.67	5	23	19	30	1.96	Deleted
10	582.96	1166.49	52	20	12	21	1.69	Unknown
12	911.38	1822.20	41	20	12	22	2.22	Unknown
14	1461.03	2919.61	225	32	9	11	2.46	Unknown

090088D03.SPC Analyzed by
c:\SEEKER\BIN\090088d03A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-4 GS090106-3

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Sampling Start:   07/16/2008 12:00:00 | Counting Start:   01/12/2009 14:37:12
Sampling Stop:    07/16/2008 12:00:00 | Decay Time. . . . . 4.32E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 9.37E+001 g | Real Time . . . . . 1801 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090054D09.SPC
-----

```

Detector #: 9 (Detector 9)

Energy(keV) = 1.25 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 0.46 + 0.026*En + 4.17E-04*En^2 + 0.00E+00*En^3 01/14/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.18	123.97	41	25	17	61	0.78	a
2	74.80	147.23	93	27	16	58	0.68	a
3	77.18	151.99	141	33	19	73	0.84	b
4	84.04	165.73	26	24	18	65	0.77	a
5	87.28	172.21	21	24	18	65	0.84	b
6	92.91	183.48	38	33	25	97	1.29	a Wide Pk
7	185.93	369.66	43	20	13	30	0.90	a
8	238.69	475.28	145	28	12	27	0.78	a
9	241.92	481.75	33	20	13	32	0.94	b
10	295.26	588.50	73	22	12	20	1.65	a
11	351.98	702.04	75	22	11	23	0.86	a
12	510.99	1020.33	41	20	13	28	1.42	a
13	583.31	1165.07	35	16	9	18	0.97	a
14	609.42	1217.33	58	18	7	11	1.11	a
15	911.26	1821.52	23	12	6	7	0.93	a
16	969.03	1937.14	19	12	6	10	0.98	a
17	1461.03	2921.95	131	24	6	6	1.87	a

090054D09.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET090109.BKG (090109-9 WEEKLY BKG)

Bkg.File Detector #: 9

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.18	41	25	17	29	25	19	
2	74.80	93	27	16	89	28	17	
3	77.18	141	33	19	138	33	19	
4	84.04	26	24	18	23	24	19	
5	87.28	21	24	18	19	24	18	
6	92.91	38	33	25	21	33	26	NET<CL
7	185.93	43	20	13	37	21	14	
8	238.69	145	28	12	139	28	12	
10	295.26	73	22	12	71	23	13	
11	351.98	75	22	11	73	22	11	
12	510.99	41	20	13	7	21	17	NET<CL
13	583.31	35	16	9	34	16	10	
14	609.42	58	18	7	55	18	8	
15	911.26	23	12	6	22	12	6	
17	1461.03	131	24	6	128	24	7	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-4 GS090106-3

 Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/12/2009 14:37:12
 Sampling Stop: 07/16/2008 12:00:00 | Decay Time. 4.32e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 9.37e+001 g | Real Time 1801 Sec
 Collection Efficiency 1.0000 | Spectrum File 090054D09.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 9 (Detector 9)

Efficiency File: (D09) (Sh11).EFF (Geo 11 Eff Cal)

Eff=10^{[-7.00E+00 +6.03E+00*L + -1.56E+00*L² +0.00E+00*L³] 01/15/2008}

Eff.= EXP[1.49E+00 + -8.33E-01 * En + -7.65E-03 * En²] Above 180.00 keV

 Library File: RA228.LIB (Ra-228)
 =====

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	1.53E+00 +- 6.39E-01	. . . . .	. . . . .	5.04E+04
	911.07	1.34E+00 +- 7.45E-01	9.49E-01	3.91E-01	5.04E+04
	968.90	2.07E+00 +- 1.24E+00	1.67E+00	6.91E-01	5.04E+04

MEASURED TOTAL: 1.53E+00 +- 6.39E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.18	123.97	29	25	19	61	0.78	Unknown
2	74.80	147.23	89	28	17	58	0.68	Unknown
3	77.18	151.99	138	33	19	73	0.84	Unknown
4	84.04	165.73	23	24	19	65	0.77	Unknown
5	87.28	172.21	19	24	18	65	0.84	Unknown
6	92.91	183.48	21	33	26	97	1.29	Deleted
7	185.93	369.66	37	21	14	30	0.90	Unknown
8	238.69	475.28	139	28	12	27	0.78	Unknown
9	241.92	481.75	33	20	13	32	0.94	Unknown
10	295.26	588.50	71	23	13	20	1.65	Unknown
11	351.98	702.04	73	22	11	23	0.86	Unknown
12	510.99	1020.33	7	21	17	28	1.42	Deleted

090054D09.SPC Analyzed by

UNKNOWN,SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	583.31	1165.07	34	16	10	18	0.97	Unknown
14	609.42	1217.33	55	18	8	11	1.11	Unknown
17	1461.03	2921.95	128	24	7	6	1.87	Unknown

c:\SEEKER\BIN\090054d09.res Analysis Results Saved.

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-5 GS090109-3

 Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:26
 Sampling Stop: 07/16/2008 12:00:00 | Decay Time. 4.39E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
 Sample Size 2.03E+002 g | Real Time 1802 Sec
 Collection Efficiency 1.0000 | Spc. File 090078D02.SPC

Detector #: 2 (Detector 2)

Energy(keV) = -0.62 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.88	150.87	55	30	22	95	0.76	a
2	77.06	155.22	122	31	19	76	0.66	b
3	87.20	175.48	47	38	29	133	1.24	a
4	89.90	180.89	42	28	20	83	0.78	b
5	92.94	186.97	71	30	20	83	0.88	c
6	129.17	259.37	22	25	19	73	0.83	a
7	185.88	372.69	63	27	18	59	1.05	a
8	238.53	477.90	316	43	20	71	1.12	a
9	241.61	484.06	75	37	27	102	1.66	b
10	295.15	591.07	128	29	15	41	1.18	a
11	338.08	676.86	63	27	18	52	1.38	a
12	351.82	704.32	208	34	15	36	1.24	a
13	462.60	925.69	19	15	10	25	0.89	a
14	510.66	1021.73	62	26	17	47	1.78	a
15	583.13	1166.57	139	28	13	26	1.77	a
16	609.35	1218.96	143	28	12	24	1.48	a
17	911.11	1822.00	68	21	11	23	1.96	a
18	968.63	1936.95	23	17	12	27	1.83	a
19	1120.49	2240.43	24	16	11	21	2.17	a
20	1460.76	2920.41	189	29	8	9	3.00	a

090078D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET020109.BKG (090109-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.88	55	30	22	45	32	24	
2	77.06	122	31	19	115	32	19	
5	92.94	71	30	20	60	30	21	
7	185.88	63	27	18	56	27	19	
8	238.53	316	43	20	307	44	21	
9	241.61	75	37	27	73	38	28	
10	295.15	128	29	15	123	30	16	
11	338.08	63	27	18	62	27	18	
12	351.82	208	34	15	201	34	16	
14	510.66	62	26	17	15	27	22	NET<CL
15	583.13	139	28	13	136	29	14	
16	609.35	143	28	12	140	28	12	
17	911.11	68	21	11	67	21	11	
20	1460.76	189	29	8	184	29	9	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-5 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:26
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.03e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090078D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 2 (Detector 2)

Efficiency File: (D02) (Sh17).EFF (Geo 17 Eff Cal)

Eff.=1/[1.07E-03*En^-4.23E+00 + 1.25E+02*En^7.56E-01] 05/21/2008

Library File: RA228.LIB (Ra-228)

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-228	Average:	x	2.13E+00 +- 5.32E-01	. . . . .	. . . . .	5.04E+04
	338.40		2.39E+00 +- 1.05E+00	1.52E+00	7.09E-01	5.04E+04
	911.07		2.38E+00 +- 7.63E-01	9.11E-01	4.07E-01	5.04E+04
	968.90		1.40E+00 +- 1.04E+00	1.59E+00	7.15E-01	5.04E+04

MEASURED TOTAL: 2.13E+00 +- 5.32E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.88	150.87	45	32	24	95	0.76	Unknown
2	77.06	155.22	115	32	19	76	0.66	Unknown
3	87.20	175.48	47	38	29	133	1.24	Unknown
4	89.90	180.89	42	28	20	83	0.78	Unknown
5	92.94	186.97	60	30	21	83	0.88	Unknown
6	129.17	259.37	22	25	19	73	0.83	Unknown
7	185.88	372.69	56	27	19	59	1.05	Unknown
8	238.53	477.90	307	44	21	71	1.12	Unknown
9	241.61	484.06	73	38	28	102	1.66	Unknown
10	295.15	591.07	123	30	16	41	1.18	Unknown
12	351.82	704.32	201	34	16	36	1.24	Unknown
13	462.60	925.69	19	15	10	25	0.89	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	510.66	1021.73	15	27	22	47	1.78	Deleted
15	583.13	1166.57	136	29	14	26	1.77	Unknown
16	609.35	1218.96	140	28	12	24	1.48	Unknown
19	1120.49	2240.43	24	16	11	21	2.17	Unknown
20	1460.76	2920.41	184	29	9	9	3.00	Unknown

c:\SEEKER\BIN\090078d02.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 17/26

Sample ID: 0812177-5 GS090109-3

Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:26
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. 4.39E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
Sample Size 2.03E+002 g | Real Time 1802 Sec
Collection Efficiency 1.0000 | Spc. File 090078D02.SPC

Detector #: 2 (Detector 2)

Energy(keV)= -0.62 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.88	150.87	55	30	22	95	0.76	a
2	77.06	155.22	122	31	19	76	0.66	b
3	87.20	175.48	47	38	29	133	1.24	a
4	89.90	180.89	42	28	20	83	0.78	b
5	92.94	186.97	71	30	20	83	0.88	c
6	129.17	259.37	22	25	19	73	0.83	a
7	185.88	372.69	63	27	18	59	1.05	a
8	238.53	477.90	316	43	20	71	1.12	a
9	241.61	484.06	75	37	27	102	1.66	b
10	295.15	591.07	128	29	15	41	1.18	a
11	338.08	676.86	63	27	18	52	1.38	a
12	351.82	704.32	208	34	15	36	1.24	a
13	462.60	925.69	19	15	10	25	0.89	a
14	510.66	1021.73	62	26	17	47	1.78	a
15	583.13	1166.57	139	28	13	26	1.77	a
16	609.35	1218.96	143	28	12	24	1.48	a
17	911.11	1822.00	68	21	11	23	1.96	a
18	968.63	1936.95	23	17	12	27	1.83	a
19	1120.49	2240.43	24	16	11	21	2.17	a
20	1460.76	2920.41	189	29	8	9	3.00	a

090078D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET020109.BKG (090109-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.88	55	30	22	45	32	24	
2	77.06	122	31	19	115	32	19	
5	92.94	71	30	20	60	30	21	
7	185.88	63	27	18	56	27	19	
8	238.53	316	43	20	307	44	21	
9	241.61	75	37	27	73	38	28	
10	295.15	128	29	15	123	30	16	
11	338.08	63	27	18	62	27	18	
12	351.82	208	34	15	201	34	16	
14	510.66	62	26	17	15	27	22	NET<CL
15	583.13	139	28	13	136	29	14	
16	609.35	143	28	12	140	28	12	
17	911.11	68	21	11	67	21	11	
20	1460.76	189	29	8	184	29	9	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-5 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:26
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.03e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090078D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 2 (Detector 2)

Efficiency File: (D02) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 05/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:	x	2.69E+00 +- 3.05E-01	. . . . .	. . . . .	1.40E+07
	295.21		2.89E+00 +- 6.96E-01	8.24E-01	3.80E-01	1.40E+07
	351.92		2.78E+00 +- 4.76E-01	4.86E-01	2.24E-01	1.40E+07
	609.31		2.56E+00 +- 5.14E-01	5.06E-01	2.28E-01	1.40E+07
	1120.29		2.11E+00 +- 1.41E+00	2.10E+00	9.34E-01	1.40E+07

MEASURED TOTAL: 2.69E+00 +- 3.05E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.88	150.87	45	32	24	95	0.76	Unknown
2	77.06	155.22	115	32	19	76	0.66	Unknown
3	87.20	175.48	47	38	29	133	1.24	Unknown
4	89.90	180.89	42	28	20	83	0.78	Unknown
5	92.94	186.97	60	30	21	83	0.88	Unknown
6	129.17	259.37	22	25	19	73	0.83	Unknown
7	185.88	372.69	56	27	19	59	1.05	Unknown
8	238.53	477.90	307	44	21	71	1.12	Unknown
9	241.61	484.06	73	38	28	102	1.66	Unknown
11	338.08	676.86	62	27	18	52	1.38	Unknown
13	462.60	925.69	19	15	10	25	0.89	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	510.66	1021.73	15	27	22	47	1.78	Deleted
15	583.13	1166.57	136	29	14	26	1.77	Unknown
17	911.11	1822.00	67	21	11	23	1.96	Unknown
18	968.63	1936.95	23	17	12	27	1.83	Unknown
20	1460.76	2920.41	184	29	9	9	3.00	Unknown

c:\SEEKER\BIN\090078d02A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-6 GS090109-3

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Sampling Start:   07/16/2008 12:00:00 | Counting Start:   01/15/2009 08:41:30
Sampling Stop:    07/16/2008 12:00:00 | Decay Time. . . . . 4.39E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.08E+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090089D03.SPC
-----

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Detector #: 3 (Detector 3)

Energy(keV)= -1.29 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	69.45	141.24	25	28	21	93	0.75	a
2	74.63	151.58	87	48	37	185	1.61	b
3	77.07	156.46	119	34	21	93	0.78	c
4	87.18	176.63	31	31	24	115	0.79	a
5	128.87	259.87	36	35	27	119	1.38	a
6	185.97	373.88	55	29	21	84	1.20	a
7	238.62	479.00	371	45	19	69	1.32	a
8	241.66	485.08	48	29	21	78	1.46	b
9	270.44	542.53	35	27	20	69	1.45	a
10	295.16	591.89	136	30	15	43	1.26	a
11	300.15	601.84	22	15	9	22	0.72	b
12	338.32	678.05	62	27	18	57	1.45	a
13	351.87	705.12	188	33	15	42	1.40	a
14	511.02	1022.87	81	24	14	30	1.69	a
15	583.17	1166.92	93	24	12	28	1.58	a
16	609.33	1219.13	146	27	11	22	1.53	a
17	911.56	1822.57	88	22	10	16	2.18	a
18	969.22	1937.69	25	15	10	19	1.34	a
19	1461.09	2919.72	179	28	7	8	2.50	a
20	1765.38	3527.26	17	9	3	2	1.77	a

090089D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	69.45	25	28	21	23	28	22	
3	77.07	119	34	21	115	34	22	
6	185.97	55	29	21	48	29	21	
7	238.62	371	45	19	361	45	20	
8	241.66	48	29	21	46	29	22	
10	295.16	136	30	15	133	30	16	
12	338.32	62	27	18	60	27	18	
13	351.87	188	33	15	183	34	16	
14	511.02	81	24	14	37	25	18	
15	583.17	93	24	12	89	25	13	
16	609.33	146	27	11	142	28	11	
17	911.56	88	22	10	86	22	10	
19	1461.09	179	28	7	174	28	8	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-6 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:30
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.08e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090089D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh17).EFF (Geo 17 Eff Cal)

Eff=10^[-3.12E+01 +2.79E+01*L + -6.55E+00*L² +0.00E+00*L³] 06/03/2008
 Eff.=1/[1.62E+00*En^{-6.17E-01} + 1.43E+02*En^{8.67E-01}] Above 180.00 keV

Library File: RA228.LIB (Ra-228)

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	2.64E+00 +- 5.76E-01	. . . . .	. . . . .	5.04E+04
	338.40	2.42E+00 +- 1.09E+00	1.59E+00	7.41E-01	5.04E+04
	911.07	3.42E+00 +- 8.86E-01	9.20E-01	4.06E-01	5.04E+04
	968.90	1.73E+00 +- 1.05E+00	1.51E+00	6.60E-01	5.04E+04

MEASURED TOTAL: 2.64E+00 +- 5.76E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	69.45	141.24	23	28	22	93	0.75	Unknown
2	74.63	151.58	87	48	37	185	1.61	Unknown
3	77.07	156.46	115	34	22	93	0.78	Unknown
4	87.18	176.63	31	31	24	115	0.79	Unknown
5	128.87	259.87	36	35	27	119	1.38	Unknown
6	185.97	373.88	48	29	21	84	1.20	Unknown
7	238.62	479.00	361	45	20	69	1.32	Unknown
8	241.66	485.08	46	29	22	78	1.46	Unknown
9	270.44	542.53	35	27	20	69	1.45	Unknown
10	295.16	591.90	133	30	16	43	1.26	Unknown
11	300.15	601.84	22	15	9	22	0.72	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	351.87	705.12	183	34	16	42	1.40	Unknown
14	511.02	1022.87	37	25	18	30	1.69	Unknown
15	583.17	1166.92	89	25	13	28	1.58	Unknown
16	609.33	1219.13	142	28	11	22	1.53	Unknown
19	1461.09	2919.72	174	28	8	8	2.50	Unknown
20	1765.38	3527.26	17	9	3	2	1.77	Unknown

c:\SEEKER\BIN\090089d03.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-6 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:30
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.08E+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090089D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV) = -1.29 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	69.45	141.24	25	28	21	93	0.75	a
2	74.63	151.58	87	48	37	185	1.61	b
3	77.07	156.46	119	34	21	93	0.78	c
4	87.18	176.63	31	31	24	115	0.79	a
5	128.87	259.87	36	35	27	119	1.38	a
6	185.97	373.88	55	29	21	84	1.20	a
7	238.62	479.00	371	45	19	69	1.32	a
8	241.66	485.08	48	29	21	78	1.46	b
9	270.44	542.53	35	27	20	69	1.45	a
10	295.16	591.89	136	30	15	43	1.26	a
11	300.15	601.84	22	15	9	22	0.72	b
12	338.32	678.05	62	27	18	57	1.45	a
13	351.87	705.12	188	33	15	42	1.40	a
14	511.02	1022.87	81	24	14	30	1.69	a
15	583.17	1166.92	93	24	12	28	1.58	a
16	609.33	1219.13	146	27	11	22	1.53	a
17	911.56	1822.57	88	22	10	16	2.18	a
18	969.22	1937.69	25	15	10	19	1.34	a
19	1461.09	2919.72	179	28	7	8	2.50	a
20	1765.38	3527.26	17	9	3	2	1.77	a

090089D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File:. DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	69.45	25	28	21	23	28	22	
3	77.07	119	34	21	115	34	22	
6	185.97	55	29	21	48	29	21	
7	238.62	371	45	19	361	45	20	
8	241.66	48	29	21	46	29	22	
10	295.16	136	30	15	133	30	16	
12	338.32	62	27	18	60	27	18	
13	351.87	188	33	15	183	34	16	
14	511.02	81	24	14	37	25	18	
15	583.17	93	24	12	89	25	13	
16	609.33	146	27	11	142	28	11	
17	911.56	88	22	10	86	22	10	
19	1461.09	179	28	7	174	28	8	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-6 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 08:41:30
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.08e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090089D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 07/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:x	2.96E+00 +- 3.41E-01	. . . . .	. . . . .	1.40E+07
	295.21	3.47E+00 +- 7.81E-01	8.92E-01	4.11E-01	1.40E+07
	351.92	2.82E+00 +- 5.19E-01	5.48E-01	2.53E-01	1.40E+07
	609.31	2.87E+00 +- 5.56E-01	5.15E-01	2.30E-01	1.40E+07

MEASURED TOTAL: 2.96E+00 +- 3.41E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	69.45	141.24	23	28	22	93	0.75	Unknown
2	74.63	151.58	87	48	37	185	1.61	Unknown
3	77.07	156.46	115	34	22	93	0.78	Unknown
4	87.18	176.63	31	31	24	115	0.79	Unknown
5	128.87	259.87	36	35	27	119	1.38	Unknown
6	185.97	373.88	48	29	21	84	1.20	Unknown
7	238.62	479.00	361	45	20	69	1.32	Unknown
8	241.66	485.08	46	29	22	78	1.46	Unknown
9	270.44	542.53	35	27	20	69	1.45	Unknown
11	300.15	601.84	22	15	9	22	0.72	Unknown
12	338.32	678.05	60	27	18	57	1.45	Unknown
14	511.02	1022.87	37	25	18	30	1.69	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	583.17	1166.92	89	25	13	28	1.58	Unknown
17	911.56	1822.57	86	22	10	16	2.18	Unknown
18	969.22	1937.69	25	15	10	19	1.34	Unknown
19	1461.09	2919.72	174	28	8	8	2.50	Unknown
20	1765.38	3527.26	17	9	3	2	1.77	Unknown

c:\SEEKER\BIN\090089d03A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-7 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 09:23:38
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.86E+002 g | Real Time . . . . . 1803 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090079D02.SPC
-----

```

Detector #: 2 (Detector 2)

Energy(keV) = -0.62 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

```

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK.  ENERGY  ADDRESS  NET/MDA  UN-    C.L.    BKG    FWHM
#    (keV)    CHANNEL  COUNTS  CERTAINTY  COUNTS  COUNTS  (keV)  FLAG
-----
 1    74.81    150.73     54      30      22      96    0.84  a
 2    77.03    155.17    118      37      25     115    0.98  b
 3    87.06    175.21     38      26      19      78    0.66  a
 4   185.97    372.87     58      25      16      54    0.81  a
 5   209.13    419.17     18      25      19      68    0.94  a NET< CL
 6   238.52    477.89    305      40      16      48    0.92  a
 7   241.50    483.85     88      33      22      72    1.45  b
 8   295.22    591.20    111      30      18      53    1.12  a
 9   338.25    677.20     56      21      13      33    0.85  a
10   351.78    704.23    195      34      15      37    1.32  a
11   509.75   1019.92     34      28      21      60    2.21  a Wide Pk
12   583.08   1166.46    106      26      13      29    1.52  a
13   609.17   1218.60    124      28      15      35    1.65  a
14   727.24   1454.54     32      18      12      22    2.28  a
15   911.46   1822.70     43      19      11      24    1.90  a
16   968.98   1937.65     36      18      11      22    1.73  a
17  1460.84   2920.57    228      32      10      14    2.80  a

```

090079D02.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET020109.BKG (090109-2 WEEKLY BKG)

Bkg.File Detector #: 2

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.81	54	30	22	44	32	24	
2	77.03	118	37	25	111	38	26	
4	185.97	58	25	16	51	25	17	
6	238.52	305	40	16	296	40	17	
7	241.50	88	33	22	86	33	23	
8	295.22	111	30	18	106	30	18	
9	338.25	56	21	13	55	22	13	
10	351.78	195	34	15	189	34	16	
11	509.75	34	28	21	-14	29	25	NET<CL
12	583.08	106	26	13	102	26	14	
13	609.17	124	28	15	120	29	15	
15	911.46	43	19	11	41	19	12	
17	1460.84	228	32	10	223	32	11	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-7 GS090109-3

 Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 09:23:38
 Sampling Stop: 07/16/2008 12:00:00 | Decay Time. 4.39e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 1.86e+002 g | Real Time 1803 Sec
 Collection Efficiency 1.0000 | Spectrum File 090079D02.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh17).EFF (Geo 17 Eff Cal)

Eff.=1/[1.07E-03*En^-4.23E+00 + 1.25E+02*En^7.56E-01] 05/21/2008

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	1.98E+00 +- 5.15E-01	. . . . .	. . . . .	5.04E+04
	338.40	2.30E+00 +- 9.09E-01	1.21E+00	5.49E-01	5.04E+04
	911.07	1.60E+00 +- 7.40E-01	1.01E+00	4.53E-01	5.04E+04
	968.90	2.38E+00 +- 1.17E+00	1.60E+00	7.08E-01	5.04E+04

MEASURED TOTAL: 1.98E+00 +- 5.15E-01 pCi/g

=====

UNKNOWN,SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.81	150.73	44	32	24	96	0.84	Unknown
2	77.03	155.17	111	38	26	115	0.98	Unknown
3	87.06	175.21	38	26	19	78	0.66	Unknown
4	185.97	372.87	51	25	17	54	0.81	Unknown
5	209.13	419.17	18	25	19	68	0.94	Deleted
6	238.52	477.89	296	40	17	48	0.92	Unknown
7	241.50	483.85	86	33	23	72	1.45	Unknown
8	295.22	591.20	106	30	18	53	1.12	Unknown
10	351.78	704.23	189	34	16	37	1.32	Unknown
11	509.75	1019.92	-14	29	25	60	2.21	Deleted
12	583.08	1166.46	102	26	14	29	1.52	Unknown
13	609.17	1218.60	120	29	15	35	1.65	Unknown

090079D02.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	727.24	1454.54	32	18	12	22	2.28	Unknown
17	1460.84	2920.57	223	32	11	14	2.80	Unknown

c:\SEEKER\BIN\090079d02.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-7 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 09:23:38
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.86E+002 g | Real Time . . . . . 1803 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090079D02.SPC
-----

```

Detector #: 2 (Detector 2)

Energy(keV) = -0.62 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

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-----
Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.81	150.73	54	30	22	96	0.84	a
2	77.03	155.17	118	37	25	115	0.98	b
3	87.06	175.21	38	26	19	78	0.66	a
4	185.97	372.87	58	25	16	54	0.81	a
5	209.13	419.17	18	25	19	68	0.94	a NET< CL
6	238.52	477.89	305	40	16	48	0.92	a
7	241.50	483.85	88	33	22	72	1.45	b
8	295.22	591.20	111	30	18	53	1.12	a
9	338.25	677.20	56	21	13	33	0.85	a
10	351.78	704.23	195	34	15	37	1.32	a
11	509.75	1019.92	34	28	21	60	2.21	a Wide Pk
12	583.08	1166.46	106	26	13	29	1.52	a
13	609.17	1218.60	124	28	15	35	1.65	a
14	727.24	1454.54	32	18	12	22	2.28	a
15	911.46	1822.70	43	19	11	24	1.90	a
16	968.98	1937.65	36	18	11	22	1.73	a
17	1460.84	2920.57	228	32	10	14	2.80	a

090079D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET020109.BKG (090109-2 WEEKLY BKG)

Bkg.File Detector #: 2

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.81	54	30	22	44	32	24	
2	77.03	118	37	25	111	38	26	
4	185.97	58	25	16	51	25	17	
6	238.52	305	40	16	296	40	17	
7	241.50	88	33	22	86	33	23	
8	295.22	111	30	18	106	30	18	
9	338.25	56	21	13	55	22	13	
10	351.78	195	34	15	189	34	16	
11	509.75	34	28	21	-14	29	25	NET<CL
12	583.08	106	26	13	102	26	14	
13	609.17	124	28	15	120	29	15	
15	911.46	43	19	11	41	19	12	
17	1460.84	228	32	10	223	32	11	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-7 GS090109-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 09:23:38
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.86e+002 g | Real Time . . . . . 1803 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090079D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 2 (Detector 2)

Efficiency File: (D02) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 05/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:x	2.66E+00 +- 3.42E-01	. . . . .	. . . . .	1.40E+07
	295.21	2.71E+00 +- 7.73E-01	1.00E+00	4.65E-01	1.40E+07
	351.92	2.84E+00 +- 5.11E-01	5.37E-01	2.48E-01	1.40E+07
	609.31	2.41E+00 +- 5.73E-01	6.63E-01	3.04E-01	1.40E+07

MEASURED TOTAL: 2.66E+00 +- 3.42E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.81	150.73	44	32	24	96	0.84	Unknown
2	77.03	155.17	111	38	26	115	0.98	Unknown
3	87.06	175.21	38	26	19	78	0.66	Unknown
4	185.97	372.87	51	25	17	54	0.81	Unknown
5	209.13	419.17	18	25	19	68	0.94	Deleted
6	238.52	477.89	296	40	17	48	0.92	Unknown
7	241.50	483.85	86	33	23	72	1.45	Unknown
9	338.25	677.20	55	22	13	33	0.85	Unknown
11	509.75	1019.92	-14	29	25	60	2.21	Deleted
12	583.08	1166.46	102	26	14	29	1.52	Unknown
14	727.24	1454.54	32	18	12	22	2.28	Unknown
15	911.46	1822.70	41	19	12	24	1.90	Unknown

090079D02.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
16	968.98	1937.65	36	18	11	22	1.73	Unknown
17	1460.84	2920.57	223	32	11	14	2.80	Unknown

c:\SEEKER\BIN\090079d02A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-8 GS090106-3

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Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/12/2009 14:42:25
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.32E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.09E+002 g | Real Time . . . . . 1874 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090060D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV) = -1.26 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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=====

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PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.65	151.54	65	33	24	97	1.07	a
2	77.09	156.40	127	34	21	83	0.99	b
3	185.92	373.66	44	31	23	89	1.52	a
4	209.45	420.64	34	29	22	81	1.47	a
5	238.59	478.79	327	42	18	60	1.24	a
6	241.73	485.07	67	29	20	68	1.49	b
7	269.96	541.41	28	26	20	62	1.85	a
8	295.18	591.77	87	26	15	47	1.08	a
9	338.39	678.03	52	25	17	50	1.45	a
10	351.89	704.98	147	29	13	35	1.04	a
11	511.10	1022.80	44	26	18	50	1.90	a
12	583.30	1166.92	84	23	12	28	1.43	a
13	609.42	1219.06	136	27	11	24	1.64	a
14	727.15	1454.08	24	17	11	22	1.82	a
15	911.58	1822.25	59	20	10	18	1.79	a
16	969.31	1937.50	21	19	13	30	2.00	a
17	1461.20	2919.43	183	29	9	14	2.40	a

090060D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File:. DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	77.09	127	34	21	124	35	22	
3	185.92	44	31	23	37	31	23	
4	209.45	34	29	22	33	29	22	
5	238.59	327	42	18	317	43	19	
6	241.73	67	29	20	65	29	20	
8	295.18	87	26	15	84	27	16	
9	338.39	52	25	17	51	25	17	
10	351.89	147	29	13	141	29	14	
11	511.10	44	26	18	-0	27	22	NET<CL
12	583.30	84	23	12	79	24	13	
13	609.42	136	27	11	132	27	12	
15	911.58	59	20	10	58	20	10	
17	1461.20	183	29	9	178	29	10	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-8 GS090106-3

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-----
Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/12/2009 14:42:25
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.32e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.09e+002 g | Real Time . . . . . 1874 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090060D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----

```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh11).EFF (Geo 11 Eff Cal)

Eff.=1/[5.20E-04*En^-4.28E+00 + 7.75E+01*En^8.00E-01] 05/28/2008

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average: x	2.11E+00 +- 5.73E-01	. . . . .	. . . . .	5.04E+04
	338.40	2.15E+00 +- 1.06E+00	1.57E+00	7.25E-01	5.04E+04
	911.07	2.34E+00 +- 8.00E-01	9.55E-01	4.23E-01	5.04E+04
	968.90	1.46E+00 +- 1.30E+00	2.05E+00	9.33E-01	5.04E+04

MEASURED TOTAL: 2.11E+00 +- 5.73E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.65	151.54	65	33	24	97	1.07	Unknown
2	77.09	156.40	124	35	22	83	0.99	Unknown
3	185.92	373.66	37	31	23	89	1.52	Unknown
4	209.45	420.64	33	29	22	81	1.47	Unknown
5	238.59	478.79	317	43	19	60	1.24	Unknown
6	241.73	485.07	65	29	20	68	1.49	Unknown
7	269.96	541.41	28	26	20	62	1.85	Unknown
8	295.18	591.77	84	27	16	47	1.08	Unknown
10	351.89	704.98	141	29	14	35	1.04	Unknown
11	511.10	1022.80	-0	27	22	50	1.90	Deleted
12	583.30	1166.92	79	24	13	28	1.43	Unknown
13	609.42	1219.06	132	27	12	24	1.64	Unknown

090060D03.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	727.15	1454.08	24	17	11	22	1.82	Unknown
17	1461.20	2919.43	178	29	10	14	2.40	Unknown

c:\SEEKER\BIN\090060d03.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-9 GS090106-3

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-----
Sampling Start:   07/16/2008 12:00:00 | Counting Start:   01/12/2009 15:23:41
Sampling Stop:    07/16/2008 12:00:00 | Decay Time. . . . . 4.32E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.04E+002 g | Real Time . . . . . 1838 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090061D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV)= -1.26 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

```

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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=====

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PEAK SEARCH RESULTS

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=====
PK.   ENERGY  ADDRESS  NET/MDA  UN-   C.L.   BKG   FWHM
#     (keV)    CHANNEL  COUNTS  CERTAINTY  COUNTS  COUNTS  (keV)  FLAG
-----
 1     74.91    152.07     36      26      19      69     0.74  a
 2     76.81    155.86     66      36      26     111     1.30  b
 3     92.87    187.91     38      36      28     113     1.50  a
 4    185.73    373.27     37      27      20      69     1.45  a
 5    238.67    478.96    189      37      20      79     1.11  a
 6    295.42    592.25     64      23      14      39     1.15  a
 7    338.14    677.53     40      21      14      35     1.54  a
 8    351.71    704.62    120      26      12      27     1.37  a
 9    510.80   1022.19     41      24      17      39     2.13  a
10    583.15   1166.63     72      23      13      30     1.71  a
11    609.41   1219.04     86      24      13      28     2.03  a
12    911.20   1821.48     35      17      10      18     1.99  a
13   1461.22   2919.45    210      31      10      14     2.75  a

```

090061D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	76.81	66	36	26	62	36	27	
3	92.87	38	36	28	27	36	28	NET<CL
4	185.73	37	27	20	29	27	21	
5	238.67	189	37	20	180	37	21	
6	295.42	64	23	14	61	24	15	
7	338.14	40	21	14	39	22	15	
8	351.71	120	26	12	114	27	13	
9	510.80	41	24	17	-3	25	21	NET<CL
10	583.15	72	23	13	67	23	14	
11	609.41	86	24	13	82	24	14	
12	911.20	35	17	10	33	17	11	
13	1461.22	210	31	10	206	31	10	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-9 GS090106-3

```

-----
Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/12/2009 15:23:41
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.32e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.04e+002 g | Real Time . . . . . 1838 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090061D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----
  
```

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh11).EFF (Geo 11 Eff Cal)

Eff.=1/[5.20E-04*En^{-4.28E+00} + 7.75E+01*En^{8.00E-01}] 05/28/2008

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-228	Average: x	1.53E+00 +- 5.85E-01	. . . . .	. . . . .	5.04E+04
	338.40	1.71E+00 +- 9.57E-01	1.41E+00	6.44E-01	5.04E+04
	911.07	1.42E+00 +- 7.39E-01	1.03E+00	4.58E-01	5.04E+04

MEASURED TOTAL: 1.53E+00 +- 5.85E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.91	152.07	36	26	19	69	0.74	Unknown
2	76.81	155.86	62	36	27	111	1.30	Unknown
3	92.87	187.91	27	36	28	113	1.50	Deleted
4	185.73	373.27	29	27	21	69	1.45	Unknown
5	238.67	478.96	180	37	21	79	1.11	Unknown
6	295.42	592.25	61	24	15	39	1.15	Unknown
8	351.71	704.62	114	27	13	27	1.37	Unknown
9	510.80	1022.19	-3	25	21	39	2.13	Deleted
10	583.15	1166.63	67	23	14	30	1.71	Unknown
11	609.41	1219.04	82	24	14	28	2.03	Unknown
13	1461.22	2919.45	206	31	10	14	2.75	Unknown

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-10 GS090109-3

Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 09:23:41
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. 4.39E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
Sample Size 2.07E+002 g | Real Time 1803 Sec
Collection Efficiency 1.0000 | Spc. File 090090D03.SPC

Detector #: 3 (Detector 3)

Energy(keV)= -1.29 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.86	152.04	52	35	26	119	1.12	a
2	76.99	156.29	71	33	23	102	0.94	b
3	93.15	188.55	26	23	17	61	0.74	a
4	185.95	373.85	33	26	19	74	1.07	a
5	238.51	478.77	253	41	22	95	1.08	a
6	270.01	541.67	22	20	14	43	0.95	a
7	295.17	591.91	90	27	16	50	1.11	a
8	338.18	677.78	48	23	15	43	1.35	a
9	351.82	705.01	171	30	12	27	1.33	a
10	463.10	927.19	17	14	9	20	0.88	a
11	509.86	1020.54	35	21	15	35	1.68	a
12	583.18	1166.93	73	22	11	23	1.41	a
13	609.29	1219.07	104	28	16	46	1.80	a
14	911.52	1822.47	48	17	8	13	1.52	a
15	1460.83	2919.20	215	30	6	5	3.08	a

=====

090090D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File:. DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	76.99	71	33	24	67	33	24	
3	93.15	26	23	17	15	23	18	NET<CL
4	185.95	33	26	19	26	27	20	
5	238.51	253	41	22	243	42	23	
7	295.17	90	27	16	87	27	16	
8	338.18	48	23	15	47	23	16	
9	351.82	171	30	12	165	30	13	
11	509.86	35	21	15	-10	23	19	NET<CL
12	583.18	73	22	11	69	22	12	
13	609.29	104	28	16	100	28	17	
14	911.52	48	17	8	46	17	9	
15	1460.83	215	30	6	210	30	7	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-10 GS090109-3

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-----
Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 09:23:41
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.07e+002 g | Real Time . . . . . 1803 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090090D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh17).EFF (Geo 17 Eff Cal)

Eff=10^[-3.12E+01 +2.79E+01*L +-6.55E+00*L² +0.00E+00*L³] 06/03/2008

Eff.=1/[1.62E+00*En^{-6.17E-01} + 1.43E+02*En^{8.67E-01}] Above 180.00 keV

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	1.84E+00 +- 5.49E-01	. . . . .	. . . . .	5.04E+04
	338.40	1.87E+00 +- 9.38E-01	1.36E+00	6.26E-01	5.04E+04
	911.07	1.82E+00 +- 6.77E-01	7.84E-01	3.38E-01	5.04E+04

MEASURED TOTAL: 1.84E+00 +- 5.49E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.86	152.04	52	35	26	119	1.12	Unknown
2	76.99	156.29	67	33	24	102	0.94	Unknown
3	93.15	188.55	15	23	18	61	0.74	Deleted
4	185.95	373.85	26	27	20	74	1.07	Unknown
5	238.51	478.77	243	42	23	95	1.08	Unknown
6	270.01	541.67	22	20	14	43	0.95	Unknown
7	295.17	591.91	87	27	16	50	1.11	Unknown
9	351.82	705.01	165	30	13	27	1.33	Unknown
10	463.10	927.19	17	14	9	20	0.88	Unknown
11	509.86	1020.54	-10	23	19	35	1.68	Deleted
12	583.18	1166.93	69	22	12	23	1.41	Unknown
13	609.29	1219.07	100	28	17	46	1.80	Unknown

090090D03.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	1460.83	2919.20	210	30	7	5	3.08	Unknown

c:\SEEKER\BIN\090090d03.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-10 GS090109-3

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-----
Sampling Start:   07/16/2008 12:00:00 | Counting Start:   01/15/2009 09:23:41
Sampling Stop:    07/16/2008 12:00:00 | Decay Time. . . . . 4.39E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.07E+002 g | Real Time . . . . . 1803 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090090D03.SPC
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```

Detector #: 3 (Detector 3)

Energy(keV) = -1.29 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

```
-----
Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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```

=====

PEAK SEARCH RESULTS

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=====
```

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.86	152.04	52	35	26	119	1.12	a
2	76.99	156.29	71	33	23	102	0.94	b
3	93.15	188.55	26	23	17	61	0.74	a
4	185.95	373.85	33	26	19	74	1.07	a
5	238.51	478.77	253	41	22	95	1.08	a
6	270.01	541.67	22	20	14	43	0.95	a
7	295.17	591.91	90	27	16	50	1.11	a
8	338.18	677.78	48	23	15	43	1.35	a
9	351.82	705.01	171	30	12	27	1.33	a
10	463.10	927.19	17	14	9	20	0.88	a
11	509.86	1020.54	35	21	15	35	1.68	a
12	583.18	1166.93	73	22	11	23	1.41	a
13	609.29	1219.07	104	28	16	46	1.80	a
14	911.52	1822.47	48	17	8	13	1.52	a
15	1460.83	2919.20	215	30	6	5	3.08	a

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090090D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	76.99	71	33	24	67	33	24	
3	93.15	26	23	17	15	23	18	NET<CL
4	185.95	33	26	19	26	27	20	
5	238.51	253	41	22	243	42	23	
7	295.17	90	27	16	87	27	16	
8	338.18	48	23	15	47	23	16	
9	351.82	171	30	12	165	30	13	
11	509.86	35	21	15	-10	23	19	NET<CL
12	583.18	73	22	11	69	22	12	
13	609.29	104	28	16	100	28	17	
14	911.52	48	17	8	46	17	9	
15	1460.83	215	30	6	210	30	7	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-10 GS090109-3

```

-----
Sampling Start: 07/16/2008 12:00:00 | Counting Start: 01/15/2009 09:23:41
Sampling Stop: 07/16/2008 12:00:00 | Decay Time. . . . . 4.39e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.07e+002 g | Real Time . . . . . 1803 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090090D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----
  
```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 07/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV) T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:x	2.33E+00 +- 3.23E-01	. . . . .	. . . . .	1.40E+07
	295.21	2.27E+00 +- 7.10E-01	9.26E-01	4.28E-01	1.40E+07
	351.92	2.55E+00 +- 4.68E-01	4.51E-01	2.05E-01	1.40E+07
	609.31	2.02E+00 +- 5.76E-01	7.32E-01	3.39E-01	1.40E+07

MEASURED TOTAL: 2.33E+00 +- 3.23E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.86	152.04	52	35	26	119	1.12	Unknown
2	76.99	156.29	67	33	24	102	0.94	Unknown
3	93.15	188.55	15	23	18	61	0.74	Deleted
4	185.95	373.85	26	27	20	74	1.07	Unknown
5	238.51	478.77	243	42	23	95	1.08	Unknown
6	270.01	541.67	22	20	14	43	0.95	Unknown
8	338.18	677.78	47	23	16	43	1.35	Unknown
10	463.10	927.19	17	14	9	20	0.88	Unknown
11	509.86	1020.54	-10	23	19	35	1.68	Deleted
12	583.18	1166.93	69	22	12	23	1.41	Unknown
14	911.52	1822.47	46	17	9	13	1.52	Unknown
15	1460.83	2919.20	210	30	7	5	3.08	Unknown

090090D03.SPC Analyzed by

c:\SEEKER\BIN\090090d03A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-11 GS090106-3

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Sampling Start: 07/17/2008 12:00:00 | Counting Start: 01/12/2009 15:23:56
Sampling Stop: 07/17/2008 12:00:00 | Decay Time. . . . . 4.30E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 8.19E+001 g | Real Time . . . . . 1801 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090079D06.SPC
-----

```

Detector #: 6 (Detector 6)

Energy(keV) = -0.44 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 0.73 + 0.012*En + 6.10E-04*En^2 + 0.00E+00*En^3 07/25/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.91	150.59	33	19	12	37	0.56	a
2	77.15	155.07	70	25	15	49	0.72	b
3	87.31	175.36	17	19	14	48	0.45	a
4	186.09	372.76	52	21	13	32	0.88	a
5	238.84	478.17	238	36	15	37	1.09	a
6	241.75	484.00	61	27	18	48	1.53	b
7	295.41	591.24	55	22	14	35	1.04	a
8	338.69	677.73	44	20	12	27	1.06	a
9	352.13	704.57	121	25	9	18	1.04	a
10	511.03	1022.11	51	24	16	34	2.06	a Wide Pk
11	583.50	1166.94	91	23	11	23	1.29	a
12	609.72	1219.33	68	20	10	17	1.27	a
13	911.70	1822.80	56	19	9	15	1.83	a
14	969.68	1938.66	33	19	13	28	1.89	a
15	1461.62	2921.75	110	22	5	4	2.10	a

090079D06.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET060109.BKG (090109-6 WEEKLY BKG)

Bkg.File Detector #: 6

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BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.91	33	19	12	31	19	13	
3	87.31	17	19	14	16	19	14	
4	186.09	52	21	13	50	21	13	
5	238.84	238	36	15	233	36	16	
7	295.41	55	22	14	52	23	15	
9	352.13	121	25	9	117	25	10	
10	511.03	51	24	16	12	25	20	NET<CL
12	609.72	68	20	10	64	20	10	
13	911.70	56	19	9	55	19	10	
15	1461.62	110	22	5	101	22	7	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-11 GS090106-3

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Sampling Start: 07/17/2008 12:00:00 | Counting Start: 01/12/2009 15:23:56
Sampling Stop: 07/17/2008 12:00:00 | Decay Time. . . . . 4.30e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 8.19e+001 g | Real Time . . . . . 1801 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090079D06.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 6 (Detector 6)

Efficiency File: (D06) (Sh11).EFF (Det.6 Geo.11 Eff Cal)

Eff=10^{[-3.37E+01 +3.01E+01*L +-7.01E+00*L² +0.00E+00*L³] 10/07/2008}

Eff.=10^{[-3.67E+00 +3.70E+00*L +-1.58E+00*L² +1.81E-01*L³] Above 180.00 keV}

Library File: RA228.LIB (Ra-228)

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:	x	2.83E+00 +- 7.05E-01	. . . . .	. . . . .	5.04E+04
	338.40		2.38E+00 +- 1.07E+00	1.46E+00	6.59E-01	5.04E+04
	911.07		3.13E+00 +- 1.07E+00	1.26E+00	5.53E-01	5.04E+04
	968.90		3.28E+00 +- 1.90E+00	2.79E+00	1.26E+00	5.04E+04

MEASURED TOTAL: 2.83E+00 +- 7.05E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.91	150.59	31	19	13	37	0.56	Unknown
2	77.15	155.07	70	25	15	49	0.72	Unknown
3	87.31	175.36	16	19	14	48	0.45	Unknown
4	186.09	372.77	50	21	13	32	0.88	Unknown
5	238.84	478.17	233	36	16	37	1.09	Unknown
6	241.75	484.00	61	27	18	48	1.53	Unknown
7	295.41	591.24	52	23	15	35	1.04	Unknown
9	352.13	704.57	117	25	10	18	1.04	Unknown
10	511.03	1022.11	12	25	20	34	2.06	Deleted
11	583.50	1166.94	91	23	11	23	1.29	Unknown
12	609.72	1219.33	64	20	10	17	1.27	Unknown

090079D06.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	1461.62	2921.75	101	22	7	4	2.10	Unknown

c:\SEEKER\BIN\090079d06.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-12 GS090106-3

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Sampling Start:   07/17/2008 12:00:00 | Counting Start:   01/12/2009 15:24:01
Sampling Stop:    07/17/2008 12:00:00 | Decay Time. . . . . 4.30E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 8.38E+001 g | Real Time . . . . . 1803 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090018D08.SPC
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```

Detector #: 8 (Detector 8)

Energy(keV) = -1.42 + 0.500*Ch + 1.93E-07*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.54	95.92	53	25	17	58	0.90	a
2	63.23	129.29	38	28	21	86	0.87	a
3	74.96	152.76	141	35	22	95	0.74	a
4	77.24	157.32	244	41	22	95	0.76	b
5	87.38	177.59	77	33	23	98	1.01	a Wide Pk
6	89.88	182.59	28	20	14	49	0.42	b
7	93.06	188.95	72	39	29	131	1.26	c
8	186.03	374.83	50	25	17	50	1.09	a
9	238.71	480.17	309	39	14	42	0.86	a
10	242.02	486.79	51	24	16	50	0.99	b
11	295.31	593.32	67	22	12	31	0.78	a
12	338.36	679.36	62	21	12	25	0.97	a
13	352.12	706.87	120	25	10	17	0.92	a
14	510.69	1023.80	64	27	18	46	2.19	a Wide Pk
15	583.43	1169.15	83	21	9	18	1.00	a
16	609.42	1221.09	88	21	8	14	1.22	a
17	726.99	1455.97	27	14	8	13	1.35	a
18	911.27	1824.07	61	17	6	8	1.49	a
19	969.07	1939.49	22	14	9	16	1.11	a
20	1461.13	2921.75	141	25	7	8	2.04	a

090018D08.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.54	53	25	17	40	26	18	
2	63.23	38	28	21	25	28	22	
3	74.96	141	35	22	132	36	23	
4	77.24	244	41	22	238	41	22	
5	87.38	77	33	23	75	33	23	
7	93.06	72	39	29	46	39	30	
8	186.03	50	25	17	39	25	18	
9	238.71	309	39	14	299	39	16	
10	242.02	51	24	16	50	25	17	
11	295.31	67	22	12	66	22	13	
13	352.12	120	25	10	115	25	11	
14	510.69	64	27	18	16	28	22	NET<CL
15	583.43	83	21	9	79	22	10	
16	609.42	88	21	8	85	22	9	
18	911.27	61	17	6	59	18	7	
19	969.07	22	14	9	21	14	9	
20	1461.13	141	25	7	135	25	8	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-12 GS090106-3

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Sampling Start: 07/17/2008 12:00:00 | Counting Start: 01/12/2009 15:24:01
Sampling Stop: 07/17/2008 12:00:00 | Decay Time. . . . . 4.30e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 8.38e+001 g | Real Time . . . . . 1803 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090018D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 8 (Detector 8)

Efficiency File: (D08) (Sh11).EFF (Geo 11 Eff Cal)

Eff= $10^{[-7.60E+00 + 6.54E+00*L + -1.66E+00*L^2 + 0.00E+00*L^3]}$ 10/07/2008

Eff= $10^{[-2.70E+00 + 2.85E+00*L + -1.33E+00*L^2 + 1.56E-01*L^3]}$ Above 180.00 keV

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:	2.82E+00 +- 6.10E-01	. . . . .	. . . . .	5.04E+04
	338.40	3.05E+00 +- 1.04E+00	1.28E+00	5.73E-01	5.04E+04
	911.07	3.13E+00 +- 9.31E-01	9.04E-01	3.81E-01	5.04E+04
	968.90	1.88E+00 +- 1.28E+00	1.87E+00	8.14E-01	5.04E+04

MEASURED TOTAL: 2.82E+00 +- 6.10E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.54	95.92	40	26	18	58	0.90	Unknown
2	63.23	129.29	25	28	22	86	0.87	Unknown
3	74.96	152.76	132	36	23	95	0.74	Unknown
4	77.24	157.32	238	41	22	95	0.76	Unknown
5	87.38	177.59	75	33	23	98	1.01	Unknown
6	89.88	182.59	28	20	14	49	0.42	Unknown
7	93.06	188.95	46	39	30	131	1.26	Unknown
8	186.03	374.83	39	25	18	50	1.09	Unknown
9	238.71	480.17	299	39	16	42	0.86	Unknown
10	242.02	486.79	50	25	17	50	0.99	Unknown
11	295.31	593.32	66	22	13	31	0.78	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	352.12	706.87	115	25	11	17	0.92	Unknown
14	510.69	1023.80	16	28	22	46	2.19	Deleted
15	583.43	1169.15	79	22	10	18	1.00	Unknown
16	609.42	1221.09	85	22	9	14	1.22	Unknown
17	726.99	1455.97	27	14	8	13	1.35	Unknown
20	1461.13	2921.75	135	25	8	8	2.04	Unknown

c:\SEEKER\BIN\090018d08.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-14 GS090106-3

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Sampling Start: 07/17/2008 12:00:00 | Counting Start: 01/12/2009 15:24:06
Sampling Stop: 07/17/2008 12:00:00 | Decay Time. . . . . 4.30E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 8.53E+001 g | Real Time . . . . . 1801 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090055D09.SPC
-----

```

Detector #: 9 (Detector 9)

Energy(keV) = 1.25 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 0.46 + 0.026*En + 4.17E-04*En^2 + 0.00E+00*En^3 01/14/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.54	90.66	47	23	15	53	0.71	a
2	63.39	124.38	46	22	15	54	0.51	a
3	74.81	147.25	176	35	19	83	0.66	a
4	77.03	151.69	314	45	23	103	0.84	b
5	84.17	165.98	38	29	22	82	1.10	a Wide Pk
6	87.15	171.94	127	35	22	82	1.22	b
7	89.91	177.47	53	25	17	58	0.87	c
8	93.00	183.66	91	35	24	93	1.28	d
9	129.07	255.86	31	21	14	46	0.59	a
10	186.06	369.94	46	26	18	59	0.94	a
11	209.48	416.81	36	26	19	61	1.09	a
12	238.73	475.35	292	37	12	30	0.87	a
13	241.70	481.31	82	29	19	54	1.52	b
14	270.31	538.57	28	18	12	28	0.75	a
15	295.31	588.62	67	23	14	34	0.98	a
16	300.01	598.01	15	16	12	28	0.90	b
17	338.37	674.81	54	21	12	26	1.11	a
18	352.06	702.19	159	27	7	10	1.01	a
19	510.82	1019.97	48	19	10	20	1.32	a
20	583.41	1165.27	73	19	8	11	1.17	a
21	609.34	1217.17	98	23	10	17	1.24	a
22	727.60	1453.88	24	13	7	10	1.28	a
23	911.21	1821.41	41	17	10	17	1.75	a
24	969.21	1937.51	18	12	7	11	1.09	a

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1120.47	2240.28	23	11	4	4	1.09	a
26	1460.97	2921.83	108	21	4	4	1.83	a

090055D09.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File:. DET090109.BKG (090109-9 WEEKLY BKG)

Bkg.File Detector #: 9

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.54	47	23	15	33	24	17	
2	63.39	46	22	15	35	23	16	
3	74.81	176	35	19	172	36	20	
4	77.03	314	45	23	311	45	23	
5	84.17	38	29	22	35	30	22	
6	87.15	127	35	22	125	35	22	
8	93.00	91	35	24	75	35	26	
10	186.06	46	26	18	40	26	19	
12	238.73	292	37	12	286	37	13	
15	295.31	67	23	14	65	24	14	
17	338.37	54	21	12	53	21	13	
18	352.06	159	27	7	157	27	8	
19	510.82	48	19	10	14	20	15	NET<CL
20	583.41	73	19	8	71	20	8	
21	609.34	98	23	10	95	23	10	
23	911.21	41	17	10	40	18	10	
26	1460.97	108	21	4	105	21	5	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-14 GS090106-3

 Sampling Start: 07/17/2008 12:00:00 | Counting Start: 01/12/2009 15:24:06
 Sampling Stop: 07/17/2008 12:00:00 | Decay Time. 4.30e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 8.53e+001 g | Real Time 1801 Sec
 Collection Efficiency 1.0000 | Spectrum File 090055D09.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 9 (Detector 9)

Efficiency File: (D09) (Sh11).EFF (Geo 11 Eff Cal)

Eff=10^[-7.00E+00 + 6.03E+00*L + -1.56E+00*L² + 0.00E+00*L³] 01/15/2008

Eff.= EXP[1.49E+00 + -8.33E-01 * En + -7.65E-03 * En²] Above 180.00 keV

 Library File: RA228.LIB (Ra-228)
 =====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	2.74E+00	+/- 7.46E-01	. . . . .	. . . . .	5.04E+04
	338.40	3.28E+00	+/- 1.31E+00	1.73E+00	7.80E-01	5.04E+04
	911.07	2.73E+00	+/- 1.19E+00	1.56E+00	6.88E-01	5.04E+04
	968.90	2.14E+00	+/- 1.40E+00	1.95E+00	8.17E-01	5.04E+04

MEASURED TOTAL: 2.74E+00 +/- 7.46E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.54	90.66	33	24	17	53	0.71	Unknown
2	63.39	124.38	35	23	16	54	0.51	Unknown
3	74.81	147.25	172	36	20	83	0.66	Unknown
4	77.03	151.69	311	45	23	103	0.84	Unknown
5	84.17	165.98	35	30	22	82	1.10	Unknown
6	87.15	171.94	125	35	22	82	1.22	Unknown
7	89.91	177.47	53	25	17	58	0.87	Unknown
8	93.00	183.66	75	35	26	93	1.28	Unknown
9	129.07	255.86	31	21	14	46	0.59	Unknown
10	186.06	369.94	40	26	19	59	0.94	Unknown
11	209.48	416.81	36	26	19	61	1.09	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	238.73	475.35	286	37	13	30	0.87	Unknown
13	241.70	481.31	82	29	19	54	1.52	Unknown
14	270.31	538.57	28	18	12	28	0.75	Unknown
15	295.31	588.62	65	24	14	34	0.98	Unknown
16	300.01	598.01	15	16	12	28	0.90	Unknown
18	352.06	702.19	157	27	8	10	1.01	Unknown
19	510.82	1019.97	14	20	15	20	1.32	Deleted
20	583.41	1165.27	71	20	8	11	1.17	Unknown
21	609.34	1217.17	95	23	10	17	1.24	Unknown
22	727.60	1453.88	24	13	7	10	1.28	Unknown
25	1120.47	2240.28	23	11	4	4	1.09	Unknown
26	1460.97	2921.83	105	21	5	4	1.83	Unknown

c:\SEEKER\BIN\090055d09.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0812177-15 GS090106-3

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Sampling Start:   07/17/2008 12:00:00 | Counting Start:   01/12/2009 16:08:48
Sampling Stop:    07/17/2008 12:00:00 | Decay Time. . . . . 4.30E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 8.48E+001 g | Real Time . . . . . 1832 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090062D03.SPC
-----
```

Detector #: 3 (Detector 3)

Energy(keV)= -1.26 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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=====
PK.  ENERGY  ADDRESS  NET/MDA  UN-    C.L.    BKG    FWHM
#    (keV)    CHANNEL  COUNTS  CERTAINTY  COUNTS  COUNTS  (keV)  FLAG
-----
 1    74.75    151.74      80      32      22      86    0.94  a
 2    76.93    156.10      62      28      19      72    0.88  b
 3    87.06    176.31      26      23      17      66    0.71  a
 4   129.08    260.19      23      27      21      72    1.09  a
 5   186.04    373.89      34      25      18      68    0.94  a
 6   238.64    478.90     284      40      17      55    1.32  a
 7   241.66    484.93      54      29      20      69    1.56  b
 8   295.18    591.78      68      25      16      46    1.28  a
 9   338.32    677.89      43      22      14      36    1.44  a
10   351.89    704.98     133      27      11      22    1.38  a
11   511.14   1022.88      52      23      14      30    2.04  a
12   563.10   1126.59      17      12       7      13    0.82  a
13   583.47   1167.27      83      22      10      21    1.28  a
14   609.46   1219.15      88      24      12      27    1.72  a
15   727.28   1454.34      19      13       8      12    1.44  a
16   911.33   1821.74      46      20      12      23    2.44  a
17  1461.16   2919.33     158      26       5       4    2.85  a
=====
```

090062D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	76.93	62	28	19	58	28	20	
5	186.04	34	25	18	26	25	19	
6	238.64	284	40	17	274	40	18	
7	241.66	54	29	20	52	29	21	
8	295.18	68	25	16	65	26	16	
9	338.32	43	22	14	41	22	15	
10	351.89	133	27	11	127	27	12	
11	511.14	52	23	14	7	24	19	NET<CL
13	583.47	83	22	10	79	22	11	
14	609.46	88	24	12	84	24	13	
16	911.33	46	20	12	45	20	13	
17	1461.16	158	26	5	153	26	7	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-15 GS090106-3

 Sampling Start: 07/17/2008 12:00:00 | Counting Start: 01/12/2009 16:08:48
 Sampling Stop: 07/17/2008 12:00:00 | Decay Time. 4.30e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 8.48e+001 g | Real Time 1832 Sec
 Collection Efficiency 1.0000 | Spectrum File 090062D03.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh11).EFF (Geo 11 Eff Cal)

Eff.=1/[5.20E-04*En^-4.28E+00 + 7.75E+01*En^8.00E-01] 05/28/2008

 Library File: RA228.LIB (Ra-228)
 =====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:	2.31E+00 +- 7.96E-01	. . . . .	. . . . .	5.04E+04
	338.40	2.26E+00 +- 1.20E+00	1.75E+00	8.01E-01	5.04E+04
	911.07	2.34E+00 +- 1.06E+00	1.47E+00	6.63E-01	5.04E+04

MEASURED TOTAL: 2.31E+00 +- 7.96E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.75	151.74	80	32	22	86	0.94	Unknown
2	76.93	156.10	58	28	20	72	0.88	Unknown
3	87.06	176.31	26	23	17	66	0.71	Unknown
4	129.08	260.19	23	27	21	72	1.09	Unknown
5	186.04	373.89	26	25	19	68	0.94	Unknown
6	238.64	478.90	274	40	18	55	1.32	Unknown
7	241.66	484.93	52	29	21	69	1.56	Unknown
8	295.18	591.78	65	26	16	46	1.28	Unknown
10	351.89	704.98	127	27	12	22	1.38	Unknown
11	511.14	1022.88	7	24	19	30	2.04	Deleted
12	563.10	1126.59	17	12	7	13	0.82	Unknown
13	583.47	1167.27	79	22	11	21	1.28	Unknown
14	609.46	1219.15	84	24	13	27	1.72	Unknown

090062D03.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
15	727.28	1454.34	19	13	8	12	1.44	Unknown
17	1461.16	2919.33	153	26	7	4	2.85	Unknown

c:\SEEKER\BIN\090062d03.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-16 GS090109-3

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Sampling Start: 07/23/2008 12:00:00 | Counting Start: 01/15/2009 09:23:46
Sampling Stop: 07/23/2008 12:00:00 | Decay Time. . . . . 4.22E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.03E+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090046D08.SPC
-----

```

Detector #: 8 (Detector 8)

Energy(keV) = -1.55 + 0.500*Ch + 1.69E-07*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.33	129.78	28	29	22	97	0.74	a
2	74.82	152.77	108	33	21	91	0.81	a
3	77.13	157.38	194	41	24	109	0.94	b
4	84.28	171.68	32	23	16	60	0.60	a Wide Pk
5	87.14	177.41	68	31	22	90	1.03	b
6	90.14	183.41	40	18	10	30	0.38	c
7	92.71	188.55	105	42	30	135	1.47	d
8	129.00	261.13	30	25	18	61	0.90	a
9	186.13	375.38	41	24	17	53	1.05	a
10	209.10	421.33	22	15	10	26	0.55	a
11	238.53	480.18	245	37	17	51	0.93	a
12	241.54	486.20	39	22	15	43	0.89	b
13	295.15	593.40	75	25	15	40	0.91	a
14	338.17	679.42	40	20	13	30	1.03	a
15	351.88	706.84	130	27	13	29	1.03	a
16	510.47	1023.88	50	22	14	29	1.84	a
17	583.32	1169.51	65	21	11	22	1.20	a
18	609.49	1221.81	97	23	9	15	1.39	a
19	911.07	1824.46	52	17	7	10	1.35	a
20	1460.75	2922.28	234	32	7	9	1.89	a

090046D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.33	28	29	22	15	29	23	NET<CL
2	74.82	108	33	21	99	33	22	
3	77.13	194	41	24	188	41	25	
4	84.28	32	23	16	24	24	18	
5	87.14	68	32	22	65	32	22	
7	92.71	105	42	30	79	42	32	
9	186.13	41	24	17	30	25	18	
11	238.53	245	37	17	236	37	18	
12	241.54	39	22	15	37	22	15	
13	295.15	75	25	15	74	25	15	
15	351.88	130	27	13	126	28	13	
16	510.47	50	22	14	2	23	19	NET<CL
17	583.32	65	21	11	62	21	11	
18	609.49	97	23	9	95	23	10	
19	911.07	52	17	7	50	17	8	
20	1460.75	234	32	7	228	32	8	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-16 GS090109-3

 Sampling Start: 07/23/2008 12:00:00 | Counting Start: 01/15/2009 09:23:46
 Sampling Stop: 07/23/2008 12:00:00 | Decay Time: 4.22e+003 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 2.03e+002 g | Real Time 1802 Sec
 Collection Efficiency 1.0000 | Spectrum File 090046D08.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh17).EFF (Geo 17 Eff Cal)

Eff=10^[-9.46E+00 +7.81E+00*L + -1.91E+00*L² +0.00E+00*L³] 12/10/2008

Eff.=10^[4.36E-01 + -9.02E-01*L +1.54E-02*L² + -2.81E-04*L³] Above 180.00 keV

 Library File: RA228.LIB (Ra-228)
 =====

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-228	Average: x	1.79E+00 +- 5.01E-01	. . . . .	. . . . .	5.04E+04
	338.40	1.56E+00 +- 7.81E-01	1.11E+00	5.00E-01	5.04E+04
	911.07	1.95E+00 +- 6.53E-01	6.90E-01	2.93E-01	5.04E+04

MEASURED TOTAL: 1.79E+00 +- 5.01E-01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.33	129.78	15	29	23	97	0.74	Deleted
2	74.82	152.77	99	33	22	91	0.81	Unknown
3	77.13	157.38	188	41	25	109	0.94	Unknown
4	84.28	171.68	24	24	18	60	0.60	Unknown
5	87.14	177.41	65	32	22	90	1.03	Unknown
6	90.14	183.41	40	18	10	30	0.38	Unknown
7	92.71	188.55	79	42	32	135	1.47	Unknown
8	129.00	261.13	30	25	18	61	0.90	Unknown
9	186.13	375.38	30	25	18	53	1.05	Unknown
10	209.10	421.33	22	15	10	26	0.55	Unknown
11	238.53	480.18	236	37	18	51	0.93	Unknown
12	241.54	486.20	37	22	15	43	0.89	Unknown

090046D08.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	295.15	593.40	74	25	15	40	0.91	Unknown
15	351.88	706.84	126	28	13	29	1.03	Unknown
16	510.47	1023.88	2	23	19	29	1.84	Deleted
17	583.32	1169.51	62	21	11	22	1.20	Unknown
18	609.49	1221.81	95	23	10	15	1.39	Unknown
20	1460.75	2922.28	228	32	8	9	1.89	Unknown

c:\SEEKER\BIN\090046d08.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0812177-16 GS090109-3

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Sampling Start: 07/23/2008 12:00:00 | Counting Start: 01/15/2009 09:23:46
Sampling Stop: 07/23/2008 12:00:00 | Decay Time. . . . . 4.22E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.03E+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090046D08.SPC
-----

```

Detector #: 8 (Detector 8)

Energy(keV) = -1.55 + 0.500*Ch + 1.69E-07*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

```

-----
Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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=====

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PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.33	129.78	28	29	22	97	0.74	a
2	74.82	152.77	108	33	21	91	0.81	a
3	77.13	157.38	194	41	24	109	0.94	b
4	84.28	171.68	32	23	16	60	0.60	a Wide Pk
5	87.14	177.41	68	31	22	90	1.03	b
6	90.14	183.41	40	18	10	30	0.38	c
7	92.71	188.55	105	42	30	135	1.47	d
8	129.00	261.13	30	25	18	61	0.90	a
9	186.13	375.38	41	24	17	53	1.05	a
10	209.10	421.33	22	15	10	26	0.55	a
11	238.53	480.18	245	37	17	51	0.93	a
12	241.54	486.20	39	22	15	43	0.89	b
13	295.15	593.40	75	25	15	40	0.91	a
14	338.17	679.42	40	20	13	30	1.03	a
15	351.88	706.84	130	27	13	29	1.03	a
16	510.47	1023.88	50	22	14	29	1.84	a
17	583.32	1169.51	65	21	11	22	1.20	a
18	609.49	1221.81	97	23	9	15	1.39	a
19	911.07	1824.46	52	17	7	10	1.35	a
20	1460.75	2922.28	234	32	7	9	1.89	a

090046D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	63.33	28	29	22	15	29	23	NET<CL
2	74.82	108	33	21	99	33	22	
3	77.13	194	41	24	188	41	25	
4	84.28	32	23	16	24	24	18	
5	87.14	68	32	22	65	32	22	
7	92.71	105	42	30	79	42	32	
9	186.13	41	24	17	30	25	18	
11	238.53	245	37	17	236	37	18	
12	241.54	39	22	15	37	22	15	
13	295.15	75	25	15	74	25	15	
15	351.88	130	27	13	126	28	13	
16	510.47	50	22	14	2	23	19	NET<CL
17	583.32	65	21	11	62	21	11	
18	609.49	97	23	9	95	23	10	
19	911.07	52	17	7	50	17	8	
20	1460.75	234	32	7	228	32	8	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0812177-16 GS090109-3

 Sampling Start: 07/23/2008 12:00:00 | Counting Start: 01/15/2009 09:23:46
 Sampling Stop: 07/23/2008 12:00:00 | Decay Time. 4.22e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 2.03e+002 g | Real Time 1802 Sec
 Collection Efficiency 1.0000 | Spectrum File 090046D08.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 07/21/2008

 Library File: RA226.LIB (Ra-226 (215g steel can))
 =====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:x	1.88E+00	+/- 2.76E-01	. . . . .	. . . . .	1.40E+07
	295.21	1.83E+00	+/- 6.24E-01	8.19E-01	3.76E-01	1.40E+07
	351.92	1.90E+00	+/- 4.17E-01	4.43E-01	2.01E-01	1.40E+07
	609.31	1.89E+00	+/- 4.56E-01	4.50E-01	1.98E-01	1.40E+07

MEASURED TOTAL: 1.88E+00 +/- 2.76E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.33	129.78	15	29	23	97	0.74	Deleted
2	74.82	152.77	99	33	22	91	0.81	Unknown
3	77.13	157.38	188	41	25	109	0.94	Unknown
4	84.28	171.68	24	24	18	60	0.60	Unknown
5	87.14	177.41	65	32	22	90	1.03	Unknown
6	90.14	183.41	40	18	10	30	0.38	Unknown
7	92.71	188.55	79	42	32	135	1.47	Unknown
8	129.00	261.13	30	25	18	61	0.90	Unknown
9	186.13	375.38	30	25	18	53	1.05	Unknown
10	209.10	421.33	22	15	10	26	0.55	Unknown
11	238.53	480.18	236	37	18	51	0.93	Unknown
12	241.54	486.20	37	22	15	43	0.89	Unknown

090046D08.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
14	338.17	679.42	40	20	13	30	1.03	Unknown
16	510.47	1023.88	2	23	19	29	1.84	Deleted
17	583.32	1169.51	62	21	11	22	1.20	Unknown
19	911.07	1824.46	50	17	8	10	1.35	Unknown
20	1460.75	2922.28	228	32	8	9	1.89	Unknown

c:\SEEKER\BIN\090046d08A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0812177-17 GS090106-3

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Sampling Start:   07/28/2008 12:00:00 | Counting Start:   01/12/2009 16:08:52
Sampling Stop:    07/28/2008 12:00:00 | Decay Time. . . . . 4.04E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 8.85E+001 g | Real Time . . . . . 1801 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090080D06.SPC
-----

```

Detector #: 6 (Detector 6)

Energy(keV)= -0.44 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 0.73 + 0.012*En + 6.10E-04*En^2 + 0.00E+00*En^3 07/25/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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=====
PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.10	154.96	43	27	19	75	0.80	a
2	186.06	372.71	38	26	19	61	1.10	a
3	238.81	478.13	151	32	17	61	0.84	a
4	295.54	591.48	57	23	15	36	1.14	a
5	338.53	677.39	39	17	10	18	1.01	a
6	352.15	704.60	130	27	12	27	1.45	a
7	463.50	927.13	19	14	9	17	1.00	a
8	511.27	1022.59	57	24	15	33	2.13	a Wide Pk
9	583.43	1166.80	56	20	11	23	1.32	a
10	609.54	1218.98	76	22	11	21	1.34	a
11	911.84	1823.09	35	15	8	12	1.50	a
12	969.42	1938.15	31	16	9	15	1.74	a
13	1461.67	2921.85	156	25	4	3	1.88	a

090080D06.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET060109.BKG (090109-6 WEEKLY BKG)

Bkg.File Detector #: 6

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	186.06	38	26	19	36	26	19	
3	238.81	151	32	17	147	33	18	
4	295.54	57	23	15	55	24	15	
6	352.15	130	27	12	126	28	13	
8	511.27	57	24	15	18	25	19	NET<CL
10	609.54	76	22	11	73	22	11	
11	911.84	35	15	8	34	15	8	
13	1461.67	156	25	4	146	25	7	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-17 GS090106-3

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-----
Sampling Start: 07/28/2008 12:00:00 | Counting Start: 01/12/2009 16:08:52
Sampling Stop: 07/28/2008 12:00:00 | Decay Time. . . . . 4.04e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 8.85e+001 g | Real Time . . . . . 1801 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090080D06.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 6 (Detector 6)

Efficiency File: (D06) (Sh11).EFF (Det.6 Geo.11 Eff Cal)

Eff=10^[-3.37E+01 +3.01E+01*L +-7.01E+00*L² +0.00E+00*L³] 10/07/2008

Eff.=10^[-3.67E+00 +3.70E+00*L +-1.58E+00*L² +1.81E-01*L³] Above 180.00 keV

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-228	Average:	x	1.99E+00 +- 5.45E-01	. . . . .	. . . . .	5.04E+04
	338.40		1.94E+00 +- 8.64E-01	1.13E+00	4.96E-01	5.04E+04
	911.07		1.78E+00 +- 8.03E-01	1.00E+00	4.29E-01	5.04E+04
	968.90		2.82E+00 +- 1.44E+00	1.94E+00	8.48E-01	5.04E+04

MEASURED TOTAL: 1.99E+00 +- 5.45E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.10	154.96	43	27	19	75	0.80	Unknown
2	186.06	372.71	36	26	19	61	1.10	Unknown
3	238.81	478.13	147	33	18	61	0.84	Unknown
4	295.54	591.48	55	24	15	36	1.14	Unknown
6	352.15	704.60	126	28	13	27	1.45	Unknown
7	463.50	927.13	19	14	9	17	1.00	Unknown
8	511.27	1022.59	18	25	19	33	2.13	Deleted
9	583.43	1166.80	56	20	11	23	1.32	Unknown
10	609.54	1218.98	73	22	11	21	1.34	Unknown
13	1461.67	2921.85	146	25	7	3	1.88	Unknown

090080D06.SPC Analyzed by
c:\SEEKER\BIN\090080d06.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0812177-18 GS090106-3

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Sampling Start:   07/28/2008 12:00:00 | Counting Start:   01/12/2009 16:08:56
Sampling Stop:    07/28/2008 12:00:00 | Decay Time. . . . . 4.04E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.09E+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090019D08.SPC
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```

Detector #: 8 (Detector 8)

Energy(keV) = -1.42 + 0.500*Ch + 1.93E-07*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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=====
PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.51	95.85	41	23	16	55	0.63	a
2	63.46	129.75	34	22	15	59	0.41	a
3	74.96	152.74	140	32	18	72	0.68	a
4	77.21	157.25	207	39	21	90	0.78	b
5	84.22	171.27	18	23	18	65	0.76	a NET< CL Wide Pk
6	87.30	177.44	61	27	18	65	0.77	b
7	90.07	182.98	48	28	21	78	0.91	c
8	92.87	188.57	92	39	28	117	1.42	d
9	144.10	291.01	9	14	10	27	0.42	a NET< CL
10	186.06	374.90	57	25	17	48	1.21	a
11	209.32	421.40	24	15	10	23	0.53	a
12	238.66	480.06	237	38	18	58	0.95	a
13	295.09	592.87	66	23	13	32	0.99	a
14	338.25	679.16	30	19	13	27	1.11	a
15	351.98	706.60	123	26	12	26	0.99	a
16	511.27	1024.95	76	27	17	37	2.30	a Wide Pk
17	583.39	1169.07	75	21	10	20	1.07	a
18	609.52	1221.28	106	24	10	20	1.24	a
19	911.36	1824.24	45	16	8	11	1.56	a
20	969.20	1939.74	16	11	7	10	0.90	a
21	1461.08	2921.65	159	26	5	4	2.03	a

090019D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.51	41	23	16	28	23	17	
2	63.46	34	22	15	20	23	17	
3	74.96	140	32	18	132	33	19	
4	77.21	207	39	21	201	39	22	
5	84.22	18	23	18	10	24	19	NET<CL
6	87.30	61	27	18	59	27	18	
8	92.87	92	39	28	66	40	30	
9	144.10	9	14	10	7	14	11	NET<CL
10	186.06	57	25	17	46	26	18	
12	238.66	237	38	18	228	38	19	
13	295.09	66	23	13	65	23	14	
15	351.98	123	26	12	119	27	13	
16	511.27	76	27	17	27	28	21	
17	583.39	75	21	10	71	21	11	
18	609.52	106	24	10	103	24	11	
19	911.36	45	16	8	44	17	8	
20	969.20	16	11	7	15	11	7	
21	1461.08	159	26	5	153	26	7	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-18 GS090106-3

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Sampling Start: 07/28/2008 12:00:00 | Counting Start: 01/12/2009 16:08:56
Sampling Stop: 07/28/2008 12:00:00 | Decay Time. . . . . 4.04e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.09e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090019D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh11).EFF (Geo 11 Eff Cal)

Eff=10^[-7.60E+00 +6.54E+00*L + -1.66E+00*L² +0.00E+00*L³] 10/07/2008

Eff.=10^[-2.70E+00 +2.85E+00*L + -1.33E+00*L² +1.56E-01*L³] Above 180.00 keV

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:	1.35E+00 +- 4.16E-01			5.04E+04
	338.40	1.12E+00 +- 7.05E-01	1.05E+00	4.73E-01	5.04E+04
	911.07	1.78E+00 +- 6.74E-01	7.85E-01	3.38E-01	5.04E+04
	968.90	1.05E+00 +- 8.02E-01	1.17E+00	4.92E-01	5.04E+04

MEASURED TOTAL: 1.35E+00 +- 4.16E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.51	95.85	28	23	17	55	0.63	Unknown
2	63.46	129.75	20	23	17	59	0.41	Unknown
3	74.96	152.74	132	33	19	72	0.68	Unknown
4	77.21	157.25	201	39	22	90	0.78	Unknown
5	84.22	171.27	10	24	19	65	0.76	Deleted
6	87.30	177.44	59	27	18	65	0.77	Unknown
7	90.07	182.98	48	29	21	78	0.91	Unknown
8	92.87	188.57	66	40	30	117	1.42	Unknown
9	144.10	291.01	7	14	11	27	0.42	Deleted
10	186.06	374.90	46	26	18	48	1.21	Unknown
11	209.32	421.40	24	15	10	23	0.53	Unknown

090019D08.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	238.66	480.06	228	38	19	58	0.95	Unknown
13	295.09	592.87	65	23	14	32	0.99	Unknown
15	351.98	706.60	119	27	13	26	0.99	Unknown
16	511.27	1024.95	27	28	21	37	2.30	Unknown
17	583.39	1169.07	71	21	11	20	1.07	Unknown
18	609.52	1221.28	103	24	11	20	1.24	Unknown
21	1461.08	2921.65	153	26	7	4	2.03	Unknown

c:\SEEKER\BIN\090019d08.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-19 GS090106-3

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Sampling Start: 07/23/2008 12:00:00 | Counting Start: 01/12/2009 16:09:00
Sampling Stop: 07/23/2008 12:00:00 | Decay Time. . . . . 4.16E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 7.87E+001 g | Real Time . . . . . 1801 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090056D09.SPC
-----

```

Detector #: 9 (Detector 9)

Energy(keV) = 1.25 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2009

FWHM(keV) = 0.46 + 0.026*En + 4.17E-04*En^2 + 0.00E+00*En^3 01/14/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.68	90.95	27	21	15	48	0.81	a
2	74.93	147.48	106	24	10	25	0.38	a
3	77.11	151.85	139	30	15	51	0.71	b
4	87.30	172.25	52	23	15	47	0.86	a
5	90.06	177.78	28	21	15	47	0.78	b
6	92.93	183.51	34	22	15	47	0.82	c
7	185.95	369.70	28	17	11	26	0.83	a
8	238.72	475.33	167	32	15	45	0.76	a
9	295.53	589.05	44	18	11	21	1.03	a
10	338.32	674.69	25	16	10	20	1.01	a
11	352.12	702.31	71	20	8	13	0.84	a
12	510.89	1020.12	34	19	12	25	1.46	a
13	583.10	1164.65	48	18	10	17	1.41	a
14	609.32	1217.15	37	16	9	17	0.90	a
15	911.63	1822.26	28	12	5	5	0.98	a
16	969.12	1937.33	19	13	8	13	1.25	a
17	1461.04	2921.98	103	21	5	4	2.07	a

090056D09.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET090109.BKG (090109-9 WEEKLY BKG)

Bkg.File Detector #: 9

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.68	27	21	15	14	22	17	NET<CL
2	74.93	106	24	10	102	24	10	
3	77.11	139	30	15	136	30	16	
4	87.30	52	23	15	50	24	16	
6	92.93	34	22	15	17	22	17	
7	185.95	28	17	11	22	18	12	
8	238.72	167	32	15	161	32	16	
9	295.53	44	18	11	41	19	11	
10	338.32	25	16	10	24	16	11	
11	352.12	71	20	8	69	20	9	
12	510.89	34	19	12	-0	20	16	NET<CL
13	583.10	48	18	10	47	18	10	
14	609.32	37	16	9	34	16	10	
15	911.63	28	12	5	27	12	5	
17	1461.04	103	21	5	100	21	6	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-19 GS090106-3

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-----
Sampling Start: 07/23/2008 12:00:00 | Counting Start: 01/12/2009 16:09:00
Sampling Stop: 07/23/2008 12:00:00 | Decay Time. . . . . 4.16e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 7.87e+001 g | Real Time . . . . . 1801 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090056D09.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 9 (Detector 9)

Efficiency File: (D09) (Sh11).EFF (Geo 11 Eff Cal)

Eff=10^{[-7.00E+00 + 6.03E+00*L + -1.56E+00*L² + 0.00E+00*L³] 01/15/2008}

Eff.= EXP[1.49E+00 + -8.33E-01 * En + -7.65E-03 * En²] Above 180.00 keV

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	1.89E+00 +- 6.35E-01	. . . . .	. . . . .	5.04E+04
	338.40	1.58E+00 +- 1.09E+00	1.63E+00	7.23E-01	5.04E+04
	911.07	1.96E+00 +- 8.92E-01	9.98E-01	3.99E-01	5.04E+04
	968.90	2.35E+00 +- 1.63E+00	2.35E+00	1.00E+00	5.04E+04

MEASURED TOTAL: 1.89E+00 +- 6.35E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.68	90.95	14	22	17	48	0.81	Deleted
2	74.93	147.48	102	24	10	25	0.38	Unknown
3	77.11	151.85	136	30	16	51	0.71	Unknown
4	87.30	172.25	50	24	16	47	0.86	Unknown
5	90.07	177.78	28	21	15	47	0.78	Unknown
6	92.93	183.51	17	22	17	47	0.82	Unknown
7	185.95	369.70	22	18	12	26	0.83	Unknown
8	238.72	475.33	161	32	16	45	0.76	Unknown
9	295.53	589.05	41	19	11	21	1.03	Unknown
11	352.12	702.31	69	20	9	13	0.84	Unknown
12	510.89	1020.12	-0	20	16	25	1.46	Deleted

090056D09.SPC Analyzed by

=====

UNKNOWN,SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	583.10	1164.65	47	18	10	17	1.41	Unknown
14	609.32	1217.15	34	16	10	17	0.90	Unknown
17	1461.04	2921.98	100	21	6	4	2.07	Unknown

c:\SEEKER\BIN\090056d09.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-19D GS090106-3

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-----
Sampling Start:   07/23/2008 12:00:00 | Counting Start:   01/13/2009 07:47:06
Sampling Stop:   07/23/2008 12:00:00 | Decay Time. . . . . 4.17E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 2700 Sec
Sample Size . . . . . 9.15E+001 g | Real Time . . . . . 2945 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090066D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV) = -1.32 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/13/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

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-----
Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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=====

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PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.12	156.63	42	24	17	72	0.55	a
2	86.88	176.11	18	28	22	97	0.90	a NET< CL
3	185.84	373.71	33	24	17	64	1.05	a
4	238.54	478.93	270	40	19	69	1.13	a
5	241.59	485.02	41	24	17	59	1.01	b
6	295.14	591.94	78	27	16	49	1.34	a
7	337.94	677.41	35	21	14	41	1.03	a
8	351.74	704.96	101	28	16	46	1.31	a
9	462.85	926.82	25	19	13	29	1.54	a
10	510.99	1022.95	77	28	18	41	2.41	a Wide Pk
11	583.14	1167.02	82	25	14	37	1.72	a
12	609.17	1218.99	104	25	13	29	1.57	a
13	911.17	1822.01	41	18	11	22	1.67	a
14	969.19	1937.86	29	19	13	30	1.88	a
15	1460.68	2919.23	251	33	7	9	2.70	a

090066D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	77.12	42	24	17	36	26	19	
3	185.84	33	24	17	21	25	19	
4	238.54	270	40	19	255	41	21	
5	241.59	41	24	17	38	25	18	
6	295.14	78	27	16	74	27	17	
7	337.94	35	21	14	33	21	15	
8	351.74	101	28	16	92	28	17	
10	510.99	77	28	18	10	30	24	NET<CL
11	583.14	82	25	14	75	26	16	
12	609.17	104	25	13	98	26	14	
13	911.17	41	18	11	38	19	12	
15	1460.68	251	33	7	244	33	9	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-19D GS090106-3

 Sampling Start: 07/23/2008 12:00:00 | Counting Start: 01/13/2009 07:47:06
 Sampling Stop: 07/23/2008 12:00:00 | Decay Time. 4.17e+003 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 2700 Sec
 Sample Size 9.15e+001 g | Real Time 2945 Sec
 Collection Efficiency 1.0000 | Spectrum File 090066D03.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh11).EFF (Geo 11 Eff Cal)

Eff.=1/[5.20E-04*En^-4.28E+00 + 7.75E+01*En^8.00E-01] 05/28/2008

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	1.25E+00 +- 4.21E-01	. . . . .	. . . . .	5.04E+04
	338.40	1.10E+00 +- 7.09E-01	1.07E+00	4.91E-01	5.04E+04
	911.07	1.23E+00 +- 6.02E-01	8.33E-01	3.73E-01	5.04E+04
	968.90	1.61E+00 +- 1.06E+00	1.59E+00	7.20E-01	5.04E+04

MEASURED TOTAL: 1.25E+00 +- 4.21E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.12	156.63	36	26	19	72	0.55	Unknown
2	86.88	176.11	18	28	22	97	0.90	Deleted
3	185.84	373.71	21	25	19	64	1.05	Unknown
4	238.54	478.93	255	41	21	69	1.13	Unknown
5	241.59	485.02	38	25	18	59	1.01	Unknown
6	295.14	591.94	74	27	17	49	1.34	Unknown
8	351.74	704.96	92	28	17	46	1.31	Unknown
9	462.85	926.82	25	19	13	29	1.54	Unknown
10	510.99	1022.95	10	30	24	41	2.41	Deleted
11	583.14	1167.02	75	26	16	37	1.72	Unknown
12	609.17	1218.99	98	26	14	29	1.57	Unknown
15	1460.68	2919.23	244	33	9	9	2.70	Unknown

090066D03.SPC Analyzed by

c:\SEEKER\BIN\090066d03.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0812177-20 GS090106-3

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-----
Sampling Start:   07/28/2008 12:00:00 | Counting Start:   01/13/2009 07:54:14
Sampling Stop:    07/28/2008 12:00:00 | Decay Time. . . . . 4.05E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.01E+002 g | Real Time . . . . . 1819 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090023D08.SPC
-----
```

Detector #: 8 (Detector 8)

Energy(keV)= -1.53 + 0.500*Ch + 1.92E-07*Ch^2 + 0.00E+00*Ch^3 01/13/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

```
-----
Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.43	95.93	41	29	22	88	0.90	a
2	53.29	109.64	22	18	13	40	0.47	a
3	63.23	129.53	61	22	13	46	0.39	a
4	74.84	152.74	184	36	20	80	0.86	a
5	77.10	157.28	319	43	20	80	0.80	b
6	87.24	177.55	93	34	23	98	0.97	a
7	90.05	183.17	30	24	17	65	0.63	b
8	93.02	189.10	104	37	26	114	1.09	c
9	128.98	261.01	15	16	11	32	0.55	a
10	186.01	375.06	68	26	17	50	1.22	a
11	209.06	421.15	20	24	18	56	1.17	a
12	238.57	480.16	341	40	13	32	0.86	a
13	241.55	486.12	65	29	20	57	1.40	b
14	295.18	593.34	88	26	15	37	1.09	a
15	299.99	602.96	23	19	13	32	0.96	b
16	338.27	679.48	65	23	14	35	1.04	a
17	351.79	706.52	138	29	14	34	1.09	a
18	510.90	1024.53	52	22	14	33	1.54	a
19	583.29	1169.21	129	25	9	16	1.18	a
20	609.23	1221.05	125	26	10	19	1.44	a
21	727.31	1456.97	28	14	8	11	1.42	a
22	860.44	1722.93	17	12	7	12	1.17	a
23	911.28	1824.48	60	18	8	12	1.46	a
24	968.85	1939.47	38	15	6	10	1.04	a

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1120.29	2241.88	21	12	7	8	1.65	a
26	1460.68	2921.37	178	27	5	6	1.84	a

090023D08.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.43	41	29	22	29	30	23	
2	53.29	22	18	13	20	18	13	
3	63.23	61	22	13	48	23	15	
4	74.84	184	36	20	176	37	21	
5	77.10	319	43	20	313	43	21	
6	87.24	93	34	23	91	34	23	
8	93.02	104	37	26	78	38	28	
10	186.01	68	27	17	57	27	18	
12	238.57	341	40	13	332	40	14	
13	241.55	65	29	20	64	29	20	
14	295.18	88	26	15	87	26	15	
17	351.79	138	29	14	134	29	15	
18	510.90	52	22	14	3	23	19	NET<CL
19	583.29	129	25	9	125	25	10	
20	609.23	125	26	10	122	26	11	
23	911.28	60	18	8	59	18	8	
24	968.85	38	15	6	37	15	7	
26	1460.68	178	27	5	172	28	7	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0812177-20 GS090106-3

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Sampling Start: 07/28/2008 12:00:00 | Counting Start: 01/13/2009 07:54:14
Sampling Stop: 07/28/2008 12:00:00 | Decay Time. . . . . 4.05e+003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.01e+002 g | Real Time . . . . . 1819 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090023D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----

```

Detector #: 8 (Detector 8)

Efficiency File: (D08) (Sh11).EFF (Geo 11 Eff Cal)

Eff=10^{[-7.60E+00 +6.54E+00*L +-1.66E+00*L² +0.00E+00*L³] 10/07/2008}

Eff.=10^{[-2.70E+00 +2.85E+00*L +-1.33E+00*L² +1.56E-01*L³] Above 180.00 keV}

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-228	Average:x	2.65E+00 +- 5.35E-01	. . . . .	. . . . .	5.04E+04
	338.40	2.64E+00 +- 9.45E-01	1.23E+00	5.62E-01	5.04E+04
	911.07	2.58E+00 +- 8.02E-01	8.53E-01	3.67E-01	5.04E+04
	968.90	2.81E+00 +- 1.11E+00	1.24E+00	5.18E-01	5.04E+04

MEASURED TOTAL: 2.65E+00 +- 5.35E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.43	95.93	29	30	23	88	0.90	Unknown
2	53.29	109.64	20	18	13	40	0.47	Unknown
3	63.23	129.53	48	23	15	46	0.39	Unknown
4	74.84	152.74	176	37	21	80	0.86	Unknown
5	77.10	157.28	313	43	21	80	0.80	Unknown
6	87.24	177.55	91	34	23	98	0.97	Unknown
7	90.05	183.17	31	24	17	65	0.63	Unknown
8	93.02	189.10	78	38	28	114	1.09	Unknown
9	128.98	261.01	15	16	11	32	0.55	Unknown
10	186.01	375.06	57	27	18	50	1.22	Unknown
11	209.06	421.15	20	24	18	56	1.17	Unknown

090023D08.SPC Analyzed by

=====

UNKNOWN,SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	238.57	480.16	332	40	14	32	0.86	Unknown
13	241.55	486.12	64	29	20	57	1.40	Unknown
14	295.18	593.34	87	26	15	37	1.09	Unknown
15	299.99	602.96	23	19	13	32	0.96	Unknown
17	351.79	706.52	134	29	15	34	1.09	Unknown
18	510.90	1024.53	3	23	19	33	1.54	Deleted
19	583.29	1169.21	125	25	10	16	1.18	Unknown
20	609.23	1221.05	122	26	11	19	1.44	Unknown
21	727.31	1456.97	28	14	8	11	1.42	Unknown
22	860.44	1722.93	17	12	7	12	1.17	Unknown
25	1120.29	2241.88	21	12	7	8	1.65	Unknown
26	1460.68	2921.37	172	28	7	6	1.84	Unknown

c:\SEEKER\BIN\090023d08.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: GS090106-3MB GS090106-3

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-----
Sampling Start:   01/13/2009 08:00:00 | Counting Start:   01/13/2009 08:34:16
Sampling Stop:    01/13/2009 08:00:00 | Decay Time. . . . . 5.71E-001 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 2700 Sec
Sample Size . . . . . 9.41E+001 g | Real Time . . . . . 2701 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090060D09.SPC
-----
```

Detector #: 9 (Detector 9)

Energy(keV)= 1.19 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/13/2009

FWHM(keV) = 0.46 + 0.026*En + 4.17E-04*En^2 + 0.00E+00*En^3 01/14/2008

Where En = Sqrt(Energy in keV)

```
-----
Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
-----
```

=====

PEAK SEARCH RESULTS

```
=====
PK.  ENERGY  ADDRESS  NET/MDA  UN-      C.L.      BKG      FWHM
#    (keV)    CHANNEL  COUNTS  CERTAINTY COUNTS    COUNTS   (keV)   FLAG
-----
  1   46.39     90.47      29       13        6        11    0.40  a
  2   63.11    123.96     19       18       13       35    0.80  a
-----
```

090060D09.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET090109.BKG (090109-9 WEEKLY BKG)

Bkg.File Detector #: 9

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.39	29	13	6	9	15	12	NET<CL
2	63.11	19	18	13	2	19	16	NET<CL

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: GS090106-3MB GS090106-3

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-----
Sampling Start:   01/13/2009 08:00:00 | Counting Start:   01/13/2009 08:34:16
Sampling Stop:   01/13/2009 08:00:00 | Decay Time. . . . . 5.71e-001 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 2700 Sec
Sample Size . . . . . 9.41e+001 g | Real Time . . . . . 2701 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090060D09.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----
  
```

Detector #: 9 (Detector 9)

Efficiency File: (D09) (Sh11).EFF (Geo 11 Eff Cal)

Eff=10^[-7.00E+00 +6.03E+00*L + -1.56E+00*L² +0.00E+00*L³] 01/15/2008

Eff.= EXP[1.49E+00 + -8.33E-01 * En + -7.65E-03 * En²] Above 180.00 keV

Library File: RA228.LIB (Ra-228)

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E		Concentration	MDA	Critical Level	Halflife
	(keV)	N T	(pCi/g)			(hrs)
Ra-228	911.07	N	1.96E-01 +- 3.41E-01	5.86E-01	2.41E-01	5.04E+04

MEASURED TOTAL: 1.96E-01 +- 3.41E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.39	90.47	9	15	12	11	0.40	Deleted
2	63.11	123.96	2	19	16	35	0.80	Deleted

c:\SEEKER\BIN\090060d09.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: GS090106-3LCS GS090106-3

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-----
Sampling Start:   01/13/2009 08:00:00 | Counting Start:   01/13/2009 08:51:52
Sampling Stop:    01/13/2009 08:00:00 | Decay Time. . . . . 8.64E-001 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 2014 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090067D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV) = -1.32 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/13/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

```

-----
Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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=====

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PEAK SEARCH RESULTS

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=====
PK.   ENERGY   ADDRESS   NET/MDA   UN-      C.L.      BKG      FWHM
#     (keV)     CHANNEL   COUNTS   CERTAINTY COUNTS    COUNTS   (keV)   FLAG
-----
1      59.48     121.40     24427      374       169       5256     1.06 a HiResid
2      87.94     178.22     32464      411       163       4522     1.07 a
3     103.72     209.73       116       161       131       2920     1.08 a NET< CL
4     122.04     246.31     9272       249       130       2893     1.15 a
5     136.40     274.98     1014       152       114       2394     0.98 a
6     165.84     333.77     1237       141       100       2126     1.04 a
7     310.40     622.43       114       130       106       2207     1.13 a
8     391.69     784.73       367       143       113       2370     1.25 a
9     661.63    1323.74    41158      422        94       1634     1.69 a HiResid
10    679.25    1358.92       71        67        54        707     0.80 a
11    897.92    1795.55      234       132       105       2052     1.58 a
12   1173.25    2345.31    34408      385        84       1195     2.28 a HiResid
13   1332.45    2663.19    30878      356        47        358     2.48 a HiResid
14   1835.89    3668.41      171        43        28       105     3.44 a

```

090067D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
11	897.92	234	132	105	232	132	105	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: GS090106-3LCS GS090106-3

 Sampling Start: 01/13/2009 08:00:00 | Counting Start: 01/13/2009 08:51:52
 Sampling Stop: 01/13/2009 08:00:00 | Decay Time. 8.64e-001 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 1.00e+002 g | Real Time 2014 Sec
 Collection Efficiency 1.0000 | Spectrum File 090067D03.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh11).EFF (Geo 11 Eff Cal)

Eff.=1/[5.20E-04*En^-4.28E+00 + 7.75E+01*En^8.00E-01] 05/28/2008

Library File:ANALYTICAL.LIB (Analytical)
 =====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54	1.02E+03 +- 1.56E+01	1.42E+01	7.04E+00	3.79E+06	
Cd-109	88.02	3.82E+03 +- 4.84E+01	3.86E+01	1.92E+01	1.11E+04	
Co-57	122.07	3.03E+01 +- 8.16E-01	8.61E-01	4.26E-01	6.50E+03	
Ce-139	165.85	4.52E+00 +- 5.15E-01	7.43E-01	3.67E-01	3.30E+03	
Sn-113	391.68	3.11E+00 +- 1.21E+00	1.94E+00	9.61E-01	2.76E+03	
Cs-137	661.62	4.04E+02 +- 4.14E+00	1.87E+00	9.23E-01	2.64E+05	
Y-88	Average:x	3.12E+00 +- 7.18E-01	. . . .	. . . .	2.56E+03
	898.02	2.66E+00 +- 1.51E+00	2.44E+00	1.21E+00	2.56E+03	
	1836.01	3.25E+00 +- 8.16E-01	1.12E+00	5.33E-01	2.56E+03	
Co-60	Average:x	4.54E+02 +- 3.64E+00	. . . .	. . . .	4.62E+04
	1173.21	4.55E+02 +- 5.09E+00	2.25E+00	1.11E+00	4.62E+04	
	1332.48	4.52E+02 +- 5.22E+00	1.41E+00	6.84E-01	4.62E+04	
Hg-203	279.18	MDA	1.27E+00	6.28E-01	1.12E+03	

MEASURED TOTAL: 5.74E+03 +- 7.50E+01 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	103.72	209.73	116	161	131	2920	1.08	Deleted
5	136.40	274.98	1014	152	114	2394	0.98	Unknown
7	310.40	622.43	114	130	106	2207	1.13	1332DEsc

090067D03.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
10	679.25	1358.92	71	67	54	707	0.80	Unknown

c:\SEEKER\BIN\090067d03.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: GS090109-3MB GS090109-3

Sampling Start: 01/15/2009 13:00:00 | Counting Start: 01/15/2009 13:31:40
Sampling Stop: 01/15/2009 13:00:00 | Decay Time. 5.28E-001 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
Sample Size 1.95E+002 g | Real Time 1802 Sec
Collection Efficiency 1.0000 | Spc. File 090052D08.SPC

Detector #: 8 (Detector 8)

Energy(keV) = -1.55 + 0.500*Ch + 1.69E-07*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	510.74	1024.42	41	20	13	26	1.82 a	

090052D08.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	510.74	41	20	13	-8	22	18	NET<CL

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: GS090109-3MB GS090109-3

 Sampling Start: 01/15/2009 13:00:00 | Counting Start: 01/15/2009 13:31:40
 Sampling Stop: 01/15/2009 13:00:00 | Decay Time. 5.28e-001 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 1.95e+002 g | Real Time 1802 Sec
 Collection Efficiency 1.0000 | Spectrum File 090052D08.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08) (Sh17).EFF (Geo 17 Eff Cal)

Eff=10^{[-9.46E+00 +7.81E+00*L + -1.91E+00*L² +0.00E+00*L³] 12/10/2008}
 Eff.=10^{[4.36E-01 + -9.02E-01*L +1.54E-02*L² + -2.81E-04*L³] Above 180.00 keV}

Library File: RA228.LIB (Ra-228)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-228	911.07	N-1.69E-01 +- 3.69E-01	7.65E-01	3.31E-01	5.04E+04

MEASURED TOTAL: 0.00E+00 +- 0.00E+00 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	510.74	1024.42	-8	22	18	26	1.82	Deleted

c:\SEEKER\BIN\090052d08.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 17/26

Sample ID: GS090109-3MB GS090109-3

Sampling Start: 01/15/2009 13:00:00 | Counting Start: 01/15/2009 13:31:40
Sampling Stop: 01/15/2009 13:00:00 | Decay Time. 5.28E-001 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
Sample Size 1.95E+002 g | Real Time 1802 Sec
Collection Efficiency 1.0000 | Spc. File 090052D08.SPC

Detector #: 8 (Detector 8)

Energy(keV) = -1.55 + 0.500*Ch + 1.69E-07*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	510.74	1024.42	41	20	13	26	1.82	a

090052D08.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET080109.BKG (090109-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	510.74	41	20	13	-8	22	18	NET<CL

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: GS090109-3MB GS090109-3

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-----
Sampling Start:   01/15/2009 13:00:00 | Counting Start:   01/15/2009 13:31:40
Sampling Stop:   01/15/2009 13:00:00 | Decay Time. . . . . 5.28e-001 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.95e+002 g | Real Time . . . . . 1802 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090052D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 8 (Detector 8)

Efficiency File: (D08) (Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 07/21/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration T (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-226	351.92 N	9.34E-02 +- 1.97E-01	3.40E-01	1.49E-01	1.40E+07

MEASURED TOTAL: 9.34E-02 +- 1.97E-01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	510.74	1024.42	-8	22	18	26	1.82	Deleted

c:\SEEKER\BIN\090052d08A.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: GS090109-3LCS GS090109-3

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Sampling Start: 01/15/2009 14:00:00 | Counting Start: 01/15/2009 14:13:26
Sampling Stop: 01/15/2009 14:00:00 | Decay Time. . . . . 2.24E-001 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1847 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090097D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV) = -1.29 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

```

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.50	121.39	11097	271	140	3331	1.09	a
2	87.97	178.22	15575	294	128	2810	1.07	a
3	122.06	246.28	4466	187	107	1966	1.15	a
4	136.40	274.91	411	120	93	1587	0.94	a
5	165.87	333.75	585	114	85	1518	1.06	a
6	216.41	434.65	120	122	98	1906	1.11	a
7	221.92	445.66	115	84	66	1089	0.62	b
8	391.93	785.09	168	100	79	1245	1.15	a
9	661.70	1323.71	21199	304	72	953	1.71	a HiResid
10	898.16	1795.81	71	78	63	851	1.08	a
11	1173.34	2345.22	18408	281	61	638	2.23	a HiResid
12	1332.55	2663.10	16521	260	31	160	2.42	a HiResid
13	1836.63	3669.52	88	24	13	28	2.09	a

090097D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET030109.BKG (090109-3 WEEKLY BKG)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
10	898.16	71	78	63	70	78	63	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: GS090109-3LCS GS090109-3

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Sampling Start:   01/15/2009 14:00:00 | Counting Start:   01/15/2009 14:13:26
Sampling Stop:    01/15/2009 14:00:00 | Decay Time. . . . . 2.24e-001 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15e+002 g | Real Time . . . . . 1847 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090097D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh17) EFF (Geo 17 Eff Cal)

Eff=10^{[-3.12E+01 +2.79E+01*L +-6.55E+00*L² +0.00E+00*L³] 06/03/2008}

Eff.=1/[1.62E+00*En^{-6.17E-01} + 1.43E+02*En^{8.67E-01}] Above 180.00 keV

Library File:ANALYTICAL.LIB (Analytical)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54	4.86E+02 +- 1.19E+01	1.24E+01	6.12E+00	3.79E+06
Cd-109	88.02	1.74E+03 +- 3.29E+01	2.90E+01	1.43E+01	1.11E+04
Co-57	122.07	1.31E+01 +- 5.49E-01	6.39E-01	3.16E-01	6.50E+03
Ce-139	165.85	2.05E+00 +- 3.99E-01	6.03E-01	2.97E-01	3.30E+03
Sn-113	391.68	1.20E+00 +- 7.13E-01	1.15E+00	5.66E-01	2.76E+03
Cs-137	661.62	1.77E+02 +- 2.54E+00	1.22E+00	5.99E-01	2.64E+05
Y-88	Average:x	1.31E+00 +- 3.63E-01	. . . .	. . . .	2.56E+03
	898.02	6.87E-01 +- 7.67E-01	1.26E+00	6.17E-01	2.56E+03
	1836.01	1.49E+00 +- 4.12E-01	4.76E-01	2.15E-01	2.56E+03
Co-60	Average:x	2.13E+02 +- 2.33E+00	. . . .	. . . .	4.62E+04
	1173.21	2.13E+02 +- 3.25E+00	1.44E+00	7.06E-01	4.62E+04
	1332.48	2.13E+02 +- 3.35E+00	8.39E-01	4.02E-01	4.62E+04
Hg-203	279.18	MDA	8.31E-01	4.09E-01	1.12E+03

MEASURED TOTAL: 2.63E+03 +- 5.16E+01 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	136.40	274.91	411	120	93	1587	0.94	Unknown
6	216.41	434.65	120	122	98	1906	1.11	Unknown

090097D03.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	221.92	445.66	115	84	66	1089	0.62	Unknown

c:\SEEKER\BIN\090097d03.res Analysis Results Saved.

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: GS090109-3ALCS GS090109-3

 Sampling Start: 01/15/2009 14:00:00 | Counting Start: 01/15/2009 14:00:26
 Sampling Stop: 01/15/2009 14:00:00 | Decay Time. 7.22E-003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
 Sample Size 2.15E+002 g | Real Time 1851 Sec
 Collection Efficiency 1.0000 | Spc. File 090086D02.SPC

Detector #: 2 (Detector 2)

Energy(keV) = -0.62 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2009

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	55.93	113.00	15	81	67	1226	0.39	a NET< CL
2	72.88	146.88	507	208	167	4757	1.15	a HiResid
3	74.65	150.41	4770	210	130	3398	0.88	b HiResid
4	76.99	155.09	8814	261	149	4077	0.93	c HiResid
5	79.10	159.31	216	138	111	2718	0.62	d HiResid
6	80.96	163.02	9	85	70	1359	0.41	e NET< CL HiResid
7	83.61	168.33	109	136	111	2718	0.66	f NET< CL HiResid
8	87.04	175.18	3815	219	149	4077	1.01	g HiResid
9	89.79	180.68	996	170	130	3398	0.86	h HiResid
10	186.13	373.20	6866	240	142	3747	1.00	a
11	241.94	484.72	9139	238	116	2502	1.05	a
12	258.75	518.31	634	153	119	2414	1.11	a
13	263.37	527.55	47	80	65	1035	0.53	b NET< CL
14	274.62	550.04	359	165	132	2764	1.29	a
15	295.17	591.10	20539	318	114	2206	1.13	a
16	351.81	704.29	34724	397	112	2003	1.24	a
17	362.71	726.08	55	79	64	933	0.89	a NET< CL
18	387.33	775.27	399	168	134	2546	2.14	a Wide Pk
19	389.19	778.99	181	84	66	979	0.82	b
20	454.68	909.87	158	106	85	1260	1.52	a
21	461.88	924.26	71	71	56	724	0.80	a
22	469.64	939.77	70	88	71	988	1.16	a NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
23	480.25	960.97	212	91	71	933	1.30	a
24	487.00	974.45	355	102	78	1050	1.54	b
25	510.68	1021.77	360	140	111	1577	2.43	a Wide Pk
26	524.47	1049.32	136	123	99	1318	2.27	a Wide Pk
27	533.81	1068.00	85	86	69	879	1.38	a
28	580.13	1160.57	152	70	54	614	1.06	a
29	609.24	1218.74	26149	336	74	895	1.60	a
30	665.56	1331.29	732	92	61	653	1.73	a
31	683.08	1366.29	66	50	39	347	0.91	a
32	702.96	1406.02	276	84	63	704	1.77	a
33	719.60	1439.28	146	76	59	648	1.64	a
34	742.11	1484.27	125	72	57	594	1.69	a
35	768.37	1536.74	2297	122	62	667	1.85	a
36	785.99	1571.95	561	96	68	751	2.06	a
37	806.13	1612.20	591	85	58	587	1.85	a
38	821.38	1642.68	86	65	51	511	1.47	a
39	826.36	1652.63	87	80	64	682	1.95	b
40	838.93	1677.75	224	72	54	568	1.48	a
41	934.10	1867.94	1196	107	67	769	2.22	a
42	963.56	1926.80	110	90	72	815	2.56	a
43	1051.96	2103.47	113	63	49	458	1.81	a
44	1069.63	2138.78	71	77	62	628	2.47	a
45	1120.24	2239.91	5344	163	58	581	2.33	a
46	1133.63	2266.67	83	71	57	547	2.33	a
47	1155.30	2309.98	518	80	54	497	2.34	a
48	1181.72	2362.79	51	51	40	327	1.63	a
49	1207.69	2414.67	134	79	62	564	2.93	a
50	1238.10	2475.45	1993	112	56	488	2.56	a
51	1253.53	2506.29	75	86	69	646	3.38	a
52	1281.14	2561.45	412	76	53	473	2.26	a
53	1377.59	2754.21	1499	101	53	441	2.67	a
54	1385.45	2769.92	172	66	50	414	2.38	b
55	1401.41	2801.81	397	77	54	467	2.57	a
56	1407.90	2814.78	698	85	54	467	2.55	b
57	1509.06	3016.94	648	85	56	504	2.57	a
58	1583.41	3165.52	192	66	49	356	3.02	a
59	1661.12	3320.82	258	61	43	260	3.13	a
60	1693.09	3384.70	30	82	66	408	5.97	a NET< CL Wide Pk
61	1729.41	3457.29	971	76	35	173	3.23	a
62	1764.33	3527.06	4158	135	32	143	3.28	a HiResid
63	1847.32	3692.91	537	65	38	200	3.25	a
64	1873.26	3744.75	29	56	45	213	4.83	a NET< CL Wide Pk

090086D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET020109.BKG (090109-2 WEEKLY BKG)

Bkg.File Detector #: 2

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	72.88	507	208	167	497	208	167	
4	76.99	8814	261	149	8807	261	149	
7	83.61	109	136	111	108	136	111	NET<CL
10	186.13	6866	240	142	6859	240	143	
11	241.94	9139	238	116	9137	238	116	
12	258.75	634	153	119	633	153	119	
15	295.17	20539	318	114	20535	318	114	
16	351.81	34724	397	112	34717	397	113	
25	510.68	360	140	111	313	140	111	
29	609.24	26149	336	74	26146	336	74	
62	1764.33	4158	135	32	4156	135	32	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: GS090109-3ALCS GS090109-3

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Sampling Start:   01/15/2009 14:00:00 | Counting Start:   01/15/2009 14:00:26
Sampling Stop:    01/15/2009 14:00:00 | Decay Time. . . . . 7.22e-003 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15e+002 g | Real Time . . . . . 1851 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 090086D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 05/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-226	Average: x	4.51E+02 +- 3.88E+00	. . . . .	. . . . .	1.40E+07
	295.21	4.54E+02 +- 7.04E+00	5.09E+00	2.52E+00	1.40E+07
	351.92	4.52E+02 +- 5.17E+00	2.97E+00	1.47E+00	1.40E+07
	609.31	4.51E+02 +- 1.82E+01	2.51E+01	1.25E+01	1.40E+07
	1120.29	4.37E+02 +- 1.33E+01	9.77E+00	4.77E+00	1.40E+07

MEASURED TOTAL: 4.51E+02 +- 3.88E+00 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	55.93	113.00	15	81	67	1226	0.39	Deleted
2	72.88	146.88	497	208	167	4757	1.15	Unknown
3	74.65	150.41	4770	210	130	3398	0.88	Unknown
4	76.99	155.09	8807	261	149	4077	0.93	Unknown
5	79.10	159.31	216	138	111	2718	0.62	Unknown
6	80.96	163.02	9	85	70	1359	0.41	Deleted
7	83.61	168.33	108	136	111	2718	0.66	Deleted
8	87.04	175.18	3815	219	149	4077	1.01	Unknown
9	89.79	180.68	996	170	130	3398	0.86	Unknown
10	186.13	373.20	6859	240	143	3747	1.00	1208DEsc
11	241.94	484.72	9137	238	116	2502	1.05	Unknown

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	258.75	518.31	633	153	119	2414	1.11	1281DEsc
13	263.37	527.55	47	80	65	1035	0.53	Deleted
14	274.62	550.04	359	165	132	2764	1.29	Unknown
17	362.71	726.08	55	79	64	933	0.89	Deleted
18	387.33	775.27	399	168	134	2546	2.14	1408DEsc
19	389.19	778.99	181	84	66	979	0.82	Unknown
20	454.68	909.87	158	106	85	1260	1.52	Unknown
21	461.88	924.26	71	71	56	724	0.80	Unknown
22	469.64	939.77	70	88	71	988	1.16	Deleted
23	480.25	960.97	212	91	71	933	1.30	Unknown
24	487.00	974.45	355	102	78	1050	1.54	1509DEsc
25	510.68	1021.77	313	140	111	1577	2.43	Unknown
26	524.47	1049.32	136	123	99	1318	2.27	Unknown
27	533.81	1068.00	85	86	69	879	1.38	Unknown
28	580.13	1160.57	152	70	54	614	1.06	Unknown
29	609.24	1218.74	26146	336	74	895	1.60	SPLIT
30	665.56	1331.29	732	92	61	653	1.73	Unknown
31	683.08	1366.29	66	50	39	347	0.91	Unknown
32	702.96	1406.02	276	84	63	704	1.77	Unknown
33	719.60	1439.28	146	76	59	648	1.64	Unknown
34	742.11	1484.27	125	72	57	594	1.69	1764DEsc
35	768.37	1536.74	2297	122	62	667	1.85	1281SEsc
36	785.99	1571.95	561	96	68	751	2.06	Unknown
37	806.13	1612.20	591	85	58	587	1.85	Unknown
38	821.38	1642.68	86	65	51	511	1.47	Unknown
39	826.36	1652.63	87	80	64	682	1.95	1847DEsc
40	838.93	1677.75	224	72	54	568	1.48	Unknown
41	934.10	1867.94	1196	107	67	769	2.22	Unknown
42	963.56	1926.80	110	90	72	815	2.56	Unknown
43	1051.96	2103.47	113	63	49	458	1.81	Unknown
44	1069.63	2138.78	71	77	62	628	2.47	Unknown
46	1133.63	2266.67	83	71	57	547	2.33	Unknown
47	1155.30	2309.98	518	80	54	497	2.34	Unknown
48	1181.72	2362.79	51	51	40	327	1.63	Unknown
49	1207.69	2414.67	134	79	62	564	2.93	Unknown
50	1238.10	2475.45	1993	112	56	488	2.56	Unknown
51	1253.53	2506.29	75	86	69	646	3.38	1764SEsc
52	1281.14	2561.45	412	76	53	473	2.26	Unknown
53	1377.59	2754.21	1499	101	53	441	2.67	Unknown
54	1385.45	2769.92	172	66	50	414	2.38	Unknown
55	1401.41	2801.81	397	77	54	467	2.57	Unknown
56	1407.90	2814.78	698	85	54	467	2.55	Unknown
57	1509.06	3016.94	648	85	56	504	2.57	Unknown
58	1583.41	3165.52	192	66	49	356	3.02	Unknown
59	1661.12	3320.82	258	61	43	260	3.13	Unknown
60	1693.09	3384.70	30	82	66	408	5.97	Deleted
61	1729.41	3457.29	971	76	35	173	3.23	Unknown
62	1764.33	3527.06	4156	135	32	143	3.28	Unknown
63	1847.32	3692.91	537	65	38	200	3.25	Unknown

090086D02.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
64	1873.26	3744.75	29	56	45	213	4.83	Deleted
66	609.24	1218.74	49	2214	74	895	1.60	1120SEsc

c:\SEEKER\BIN\090086d02.res Analysis Results Saved.

Gamma Spectrometer Run Log

Date: 1-12-09Reviewed By/Date: WZ 1-12-09

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
0812227-1	WZ	2	1	210	9:26	WZ	090051002.87C	WZ
08090106-1 MB	↓	7	↓	240	9:33	↓	090044007.87C	↓
0812233-2	WZ	9	11	120	9:31	↓	090051009.87C	WZ
↓ -3	WZ	3	↓	45	↓	↓	090056003.87C	WZ
0812234-1	↓	6	↓	↓	↓	↓	090072006.87C	↓
↓ -2	↓	8	↓	↓	↓	↓	090012008.87C	↓
0812234-3	WZ	3	11	60	11:21	WZ	090058003.87C	WZ
↓ -4	↓	6	↓	↓	↓	↓	090074006.87C	↓
↓ -5	WZ	8	↓	45	↓	↓	090013008.87C	WZ
0812234-6	↓	8	11	↓	12:12	WZ	090014008.87C	↓
08081229-SMA	WZ	3	↓	120	12:32	↓	090059003.87C	WZ
↓ -SLCS	WZ	6	↓	30	12:33	↓	090075006.87C	WZ
0812176-13	↓	6	11	↓	13:07	WZ	090076006.87C	↓
↓ -14	↓	8	↓	↓	↓	↓	090015008.87C	↓
↓ -15	↓	9	↓	↓	↓	↓	090052009.87C	↓
0812262-5	WZ	2	1	210	13:24	WZ	090052002.87C	WZ
0812227-1B	↓	7	↓	↓	13:51	↓	090046007.87C	↓
0812176-16	WZ	6	11	30	13:58	WZ	090077006.87C	WZ
↓ -13D	↓	8	↓	↓	↓	↓	090016008.87C	↓
↓ -17	↓	9	↓	↓	↓	↓	090053009.87C	↓
0913502-4 (867)	WZ	4	1	45	14:19	WZ	090044004.87C	WZ
0812176-18	WZ	6	11	30	14:37	↓	090078006.87C	WZ
0812177-1	↓	8	↓	↓	↓	↓	090017008.87C	↓
↓ -4	↓	9	↓	↓	↓	↓	090054009.87C	↓

¹ Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

² Calibration geometry.

³ Count duration.

KEY:

* sample was counted on a puck

↑ sample was counted with air flow arrow pointing up

↓ sample was counted with air flow arrow pointing down

Gamma Spectrometer Run Log

Date: 1-12-09Reviewed By/Date: WAC 1-13-09

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
0812177-8	WAC	3	11	30	14:42	WAC	090060D03.87C	WAC
↓ -9	↓	3	↓	↓	15:23	↓	090061D03.87C	↓
↓ -11	↓	6	↓	↓	↓	↓	090079D06.87C	↓
↓ -12	↓	8	↓	↓	15:24	↓	090018D07.87C	↓
↓ -14	↓	9	↓	↓	↓	↓	090055D09.87C	↓
9 WAC 1-12-09 0813502-4(824)	WAC	4	1	30	15:29	WAC	090045D04.87C	WAC
0812177-15	↓	3	11	↓	16:08	↓	090062D03.87C	↓
↓ -17	↓	6	↓	↓	↓	↓	090080D06.87C	↓
↓ -18	↓	8	↓	↓	↓	↓	090019D08.87C	↓
↓ -19	↓	9	↓	↓	16:09	↓	090056D09.87C	↓
0913503-4 (868)	WAC	4	8	9 WAC 1-12-09 60	16:14	WAC	090048D04.87C	WAC
0901052-1	↓	3	6	600	16:52	↓	090063D03.87C	↓
↓ -7	↓	8	↓	↓	↓	↓	090020D08.87C	↓
↓ -11	↓	9	↓	↓	↓	↓	090057D09.87C	↓
0901049-1	WAC	6	1	1000	17:01	WAC	090081D06.87C	WAC
0901052-19	WAC	2	6	600	17:06	↓	090053D02.87C	WAC
↓ -30	↓	7	↓	↓	17:27	WAC	090047D07.87C	↓
0913503-4 (825)	↓	4	8	30	17:54	↓	090049D04.87C	↓
WAC 1-13-09								

¹ Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

² Calibration geometry.

³ Count duration.

KEY:

* sample was counted on a puck

↑ sample was counted with air flow arrow pointing up

↓ sample was counted with air flow arrow pointing down

Gamma Spectrometer Run Log

Date: 1-13-09Reviewed By/Date: WHL 1-13-09

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
G5090106-1LCS	WHL	2	1	30	7:43	WHL	090055002.50C	WHL
0812177-19D	↓	3	11	45	7:47	↓	090066003.50C	↓
0812178-3	WHL	9	↓	30	↓	↓	090059009.50C	WHL
0812177-20	↓	8	11	↓	7:54	WHL	090023008.50C	↓
0913504-4(869)	WHL	4	↓	45	7:56	↓	090051004.50C	WHL
G5090112-2LCS	WHL	7	6	30	8:01	WHL	090049007.50C	WHL
0812175-1	↓	2	11	↓	8:27	↓	090056002.50C	↓
0812212-17	↓	8	↓	↓	8:34	WHL	090024008.50C	↓
G5090106-3MB	WHL	9	↓	45	↓	↓	090060009.50C	WHL
0913504-4(869)	↓	4	11	30	8:48	WHL	090052004.50C	↓
G5090106-3LCS	↓	3	↓	30	8:51	↓	090067003.50C	WHL
0812175-2	WHL	2	11	↓	9:06	WHL	090057002.50C	↓
↓ -3	↓	8	↓	↓	↓	↓	090025008.50C	↓
0812175-5	↓	9	11	↓	9:25	WHL	090061009.50C	↓
↓ -6	WHL	3	↓	30	9:41	↓	090068003.50C	WHL
0913504-4(826)	↓	4	↓	30	↓	↓	090053004.50C	↓
0812175-7	WHL	2	11	↓	10:01	WHL	090058002.50C	WHL
↓ -9	↓	8	↓	↓	↓	↓	090026008.50C	↓
↓ -20	↓	9	↓	↓	↓	↓	090062009.50C	↓
0812175-10	↓	6	11	↓	10:07	WHL	090083006.50C	↓
↓ -17	WHL	3	↓	30	10:25	↓	090069003.50C	WHL
0913505-4(864)	WHL	4	14	↓	↓	↓	090054004.50C	↓
0812175-19	↓	2	11	30	10:42	WHL	090059002.50C	WHL
↓ -20	↓	6	↓	↓	↓	↓	090084006.50C	↓

¹ Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

² Calibration geometry.

³ Count duration.

KEY:

* sample was counted on a puck

↑ sample was counted with air flow arrow pointing up

↓ sample was counted with air flow arrow pointing down

Gamma Spectrometer Run Log

Date: 1-15-09Reviewed By/Date: WAV 1-16-09

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
0812177-2	WAV	2	17/26	30	7:36	WAV	090077502.87C	WAV
↓ -3	↓	3	↓	↓	↓	↓	090088003.87C	↓
0913501-9(869)	WAV	9	11	30	7:37	↓	090079509.87C	WAV
0812177-5	↓	2	17/26	↓	8:41	WAV	090078502.87C	↓
↓ -6	↓	3	↓	↓	↓	↓	090089503.87C	↓
↓ -20	↓	8	↓	↓	↓	↓	090045508.87C	↓
09090112-1 LCS	WAV	6	1	30	8:47	WAV	090101006.87C	WAV
0901034-1	↓	7	↓	60	8:51	↓	090069507.87C	↓
0812177-7	WAV	2	17/26	30	9:23	WAV	090079502.87C	WAV
↓ -10	↓	3	↓	↓	↓	↓	090090503.87C	↓
↓ -16	↓	8	↓	↓	↓	↓	090046508.87C	↓
0901034-5	WAV	76	1	75	9:30	WAV	090103506.87C	WAV
0812178-1	WAV	2	17/26	30	10:04	↓	090080502.87C	WAV
↓ -9	↓	3	↓	↓	↓	↓	090091503.87C	↓
↓ -11	↓	8	↓	↓	↓	↓	090047508.87C 090091503	↓
0901034-2	WAV	7	1	60	10:08	WAV	090070507.87C	WAV
0812178-13	↓	2	17/26	30	10:49	↓	090081502.87C	↓
↓ -15	↓	3	↓	↓	↓	↓	090092503.87C	↓
↓ -16	↓	8	↓	↓	↓	↓	090048508.87C	↓
0901034-3	WAV	6	1	60	11:00	WAV	090104506.87C	WAV
0901095-1	WAV	7	9 [†]	30	11:12	↓	090071507.87C	WAV
↓ -2	↓	2	↓	↓	11:32	WAV	090082502.87C	↓
↓ -8	↓	3	↓	↓	↓	↓	090093503.87C	↓
↓ -12	↓	8	↓	↓	↓	↓	090049508.87C	↓

¹ Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

² Calibration geometry.

³ Count duration.

KEY:

* sample was counted on a puck

↑ sample was counted with air flow arrow pointing up

↓ sample was counted with air flow arrow pointing down

371750 B

Gamma Spectrometer Run Log

Date: 1-15-09Reviewed By/Date: WAV 1-17-09

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
0901095-3	WAV	7	9↑	30	11:44	WAV	090072D07.87C	WAV
↓ -4	↓	2	↓	↓	12:08	↓	090083D02.87C	↓
↓ -5	↓	3	↓	↓	↓	↓	090094D03.87C	↓
↓ -6	↓	8	↓	↓	↓	↓	090050D08.87C	↓
0901095-7	↓	6	9↑	30	12:11	WAV	090105D06.87C	↓
↓ -8D	WAV	7	↓	↓	12:18	↓	090073D07.87C	WAV
↓ -9	↓	2	↓	↓	12:46	↓	090084D02.87C	↓
↓ -10	↓	3	↓	↓	↓	↓	090095D03.87C	↓
↓ -12D	↓	6	↓	↓	↓	↓	090106D06.87C	↓
↓ -11	↓	8	↓	↓	↓	↓	090051D08.87C	↓
09090115-3MB	↓	7	9↑	30	12:52	WAV	090074D07.87C	↓
↓ -3LCS	WAV	2	↓	↓	13:25	↓	090085D02.87C	WAV
0812178-18	↓	3	17/26	30	13:31	WAV	090096D03.87C	↓
09090109-3MB	↓	8	↓	↓	↓	↓	090052D08.87C	↓
0901034-4	WAV	6	1	60	13:34	WAV	090107D06.87C	WAV
↓ -5D	↓	7	↓	75	↓	↓	090076D07.87C	↓
09090109-3ALCS	WAV	2	26	30	14:00	WAV	090086D02.87C	WAV
↓ -3LCS	↓	3	17	↓	14:13	↓	090097D03.87C	↓
0812178-18D	↓	8	17/26	30	↓	↓	090053D08.87C	↓
09090113-1MB	WAV	6	1	75	15:18	WAV	090108D06.87C	WAV
0901061-1	↓	2	6	1000	15:26	↓	090090D02.87C	↓
↓ -2	↓	3	↓	↓	↓	↓	090099D03.87C	↓
↓ -8	WAV	8	↓	1000	15:27	↓	090059D08.87C	WAV
↓ -4	WAV	7	↓	1000 400	15:31	↓	090078D07.87C	WAV

WAV 1-16-09

¹ Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

² Calibration geometry.

³ Count duration.

KEY:

* sample was counted on a puck

↑ sample was counted with air flow arrow pointing up

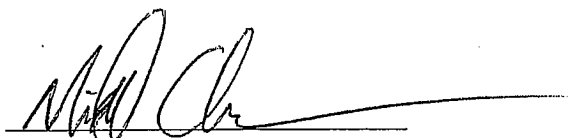
↓ sample was counted with air flow arrow pointing down

Technical Comments Regarding Gamma Spectroscopy Libraries

Library File: Ra-226.LIB

Nuclide: Ra-226 Energy: various Photon Abundance: various

Samples analyzed by this library are sealed in a steel can and allowed to ingrow for a 21-day period to ensure the capture and full ingrowth of the Rn-222 gas and associated progeny. The Bi-214 and Pb-214 daughters are assumed to be in secular equilibrium with their parent, Ra-226. Ra-226 is then quantified from the ingrown Pb-214 and Bi-214 daughters using the 1600 year half-life of the Ra-226 parent.



Gamma Spectroscopist
Radiochemistry Instrumentation Laboratory

4-13-04
Date

OK
JJB
4/14/04

OK

8/11 4/3/02

Library File: Ra226.lib
File I.D.: Ra-226 (215g steel can)

	Energy (keV)	Isotope Name	2ndary Pk #	Type	Gamma Fraction	Halflife
=====						
1	295.21	Ra-226	2	QUANT	0.1920	1.6000E+03 yrs
2	351.92	Ra-226	3	NET	0.3710	1.6000E+03 yrs
3	609.31	Ra-226	4	QUANT	0.4609	1.6000E+03 yrs
4	1120.29	Ra-226	1	QUANT	0.1510	1.6000E+03 yrs

Library File: Ra228.lib
File I.D.: Ra-228

	Energy (keV)	Isotope Name	2ndary Pk #	Type	Gamma Fraction	Halflife
1	338.40	Ra-228	2	QUANT	0.1127	5.7500E+00 yrs
2	911.07	Ra-228	3	NET	0.2580	5.7500E+00 yrs
3	968.90	Ra-228	1	QUANT	0.1580	5.7500E+00 yrs

Ra-228 updated 1/14/02. See QASS 222711.

*OK
JBS
1/15/02*

QUALITY ASSURANCE SUMMARY SHEET

PAI W.O. # / BATCH _____

TEST X spec

METHOD _____

SOP/REV (PREP) 737R4SOP/REV (ANAL) 713R6

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

After having difficulties verifying the new Ra-228 standard from Analytics (PAI Standard # 594) via gamma spec, Don Montgomery from Analytics was contacted and a copy of the gamma Ra-228 library was sent. He replied that Analytics had updated their library with new abundances obtained from the National Nuclear Data Center at Brookhaven National Lab. After verifying the abundance values being used by Analytics, it was decided that all Ra-228/Ac-228/Th-232 libraries would be updated to reflect these more current values. All such libraries have since been updated. A list of the previously used and currently used abundances for this nuclide is provided below.

Energy Line	Previous abundance	Current abundance
338.4	12.01%	11.27%
911.07	29.00%	25.80%
969.9	17.46%	15.80%

TECHNICIAN/ANALYST SADATE 1/14/02DEPARTMENT MANAGER Don MontgomeryDATE 1/15/02

222711

FORM 302r5.FRM (04/30/01)



Section 6

QUALITY ASSURANCE SUMMARY REPORTS

6

QUALITY ASSURANCE SUMMARY SHEET

PAR W.O. # / BATCH

0812176, 177, 178, 212 /
65090106-3

TEST

5-SCAN

METHOD

5-SPEC

SOP/REV (PREP)

—

SOP/REV (ANAL)

713

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

MC
01/28/09

The laboratory control sample GS090106-3LCS was counted on 1/13/09 in detector 3. The observed dead time for the count of the laboratory control sample was greater than 10%, at 10.63%. During the spectral acquisition of this source, a high activity calibration source was counting in detector 4. This detector is in the same multi-channel buffer (MCB) as detector 3. Due to the nature of the electronics involved in gamma spectroscopy, any detector acquiring data within the same MCB is affected by all other detector inputs in that MCB. Thus, the source activity in detector 4 caused an increase in the dead time observed for the entire MCB containing detectors 3 and 4. Analyst review of the raw data does not indicate any problems with the spectral acquisition for these samples. All radiometric recoveries were within the requested acceptance criteria of +/- 15%. All data quality objectives were met and the results are submitted without further qualification.

MC
01/28/09

MC
01/28/09

MC
01/28/09

MC
01/28/09

TECHNICIAN/ANALYST

DATE

01/28/09

DEPARTMENT MANAGER

DATE

1/28/09

1C108C360430

FORM 302r6.doc (4/22/04)



Section 7

LABORATORY BENCH SHEETS



Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: GS090106-3

Prep Procedure: Ra_226/228

Analytical QASS NCR? ☒ 560430

Prep Num	Lab ID	QC Type	Init Aliq	Fin Aliq	Units Geo.	Report Units	Cnt 1 File Cnt Dur (min)	Cnt 1 Inst/Det	Cnt 1 Count Date	Cnt 2 File Cnt Dur (min)	Cnt 2 Inst/Det	Cnt 2 Count Date	Cnt 3 File Cnt Dur (min)	Cnt 3 Inst/Det	Cnt 3 Count Date	Notes
1	0812176-13	SMP	92.3	92.3	g	pCi/g	30	6	1-12-09							
1	072908 09:19	DUP	92.3	92.3	g	pCi/g		8								
1	072908 09:19	SMP	103.2	103.2	g	pCi/g		8								
1	072908 09:57	SMP	108.2	108.2	g	pCi/g		9								
1	072908 09:57	SMP	102.9	102.9	g	pCi/g		6								
1	072908 12:18	SMP	93.6	93.6	g	pCi/g		9								
1	072908 13:21	SMP	98.6	98.6	g	pCi/g		6								
1	072908 13:21	SMP	96	96	g	pCi/g		8								
1	071608 08:30	SMP	93.7	93.7	g	pCi/g		9								
1	071608 09:08	SMP	109.2	109.2	g	pCi/g		3								
1	071608 09:45	SMP	104	104	g	pCi/g		3								
1	071608 09:54	SMP	81.9	81.9	g	pCi/g		6								
1	071708 14:04	SMP	83.8	83.8	g	pCi/g		8								
1	071708 14:04	SMP	85.3	85.3	g	pCi/g		9								
1	071708 14:52	SMP	84.8	84.8	g	pCi/g		3								
1	071708 14:52	SMP	88.5	88.5	g	pCi/g		6								
1	072808 10:39	SMP	109.1	109.1	g	pCi/g		8								
1	072808 10:39	SMP	78.7	78.7	g	pCi/g		9								
1	072308 11:03	DUP	91.5	91.5	g	pCi/g	45	3	1-13-09							
1	072308 11:03	SMP	100.8	100.8	g	pCi/g	30	8								
1	072808 11:11	SMP	91	91	g	pCi/g		9								
1	071108 14:52	SMP	78.2	78.2	g	pCi/g		8								
1	081212-17	SMP	94.062	94.062	g	pCi/g	45	9								
1	GS090106-3	MB	100	100	g	pCi/g	30	3								
1	12/31/08 14:36	LCS	100	100	g	pCi/g										
1	12/31/08 14:36				g	pCi/g										

Count dup.

1-10-09

1-10-09

Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: GS090106-3

Prep Procedure: Ra_226/228

Analytical QASS / NCR? Y / N 360430

Prep Num	Lab ID	Collection Date	QC Type	Init Aliq	Fin Aliq	Units Geo.	Report Units	Cnt 1 File Cnt Dur (min)	Cnt 1 Inst/Det	Cnt 1 Count Date	Cnt 2 File Cnt Dur (min)	Cnt 2 Inst/Det	Cnt 2 Count Date	Cnt 3 File Cnt Dur (min)	Cnt 3 Inst/Det	Cnt 3 Count Date	Notes
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Spike Solution Information

Soln #	Nuclide	SolntID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Am-241	826	2,188,991	DPM/g	12/31/08	100	g	
S1	Co-60	826	1,019,129	DPM/g	12/31/08	100	g	
S1	Cs-137	826	830,488	DPM/g	12/31/08	100	g	

Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: GS090106-3

Reporting Units

LabID:	TstGrpName:	RptUnits:
0812177-1	Gamma_Ra-228MitPass	pCi/g
0812178-3	Gamma_Ra-228MitPass	pCi/g
0812177-4	Gamma_Ra-228MitPass	pCi/g
0812177-8	Gamma_Ra-228MitPass	pCi/g
0812177-9	Gamma_Ra-228MitPass	pCi/g
0812177-11	Gamma_Ra-228MitPass	pCi/g
0812177-12	Gamma_Ra-228MitPass	pCi/g
0812176-13	Gamma_Ra-228MitPass	pCi/g
0812176-14	Gamma_Ra-228MitPass	pCi/g
0812177-14	Gamma_Ra-228MitPass	pCi/g
0812176-15	Gamma_Ra-228MitPass	pCi/g
0812177-15	Gamma_Ra-228MitPass	pCi/g
0812176-16	Gamma_Ra-228MitPass	pCi/g
0812212-17	Gamma_Ra-228MitPass	pCi/g
0812177-17	Gamma_Ra-228MitPass	pCi/g
0812176-17	Gamma_Ra-228MitPass	pCi/g
0812177-18	Gamma_Ra-228MitPass	pCi/g
0812176-18	Gamma_Ra-228MitPass	pCi/g
0812177-19	Gamma_Ra-228MitPass	pCi/g
0812177-20	Gamma_Ra-228MitPass	pCi/g

Sample Barcodes











0812176-13 GS090106-3PS1		0812176-13DUP GS090106-3PS2	
0812176-14 GS090106-3PS3		0812176-15 GS090106-3PS4	
0812176-16 GS090106-3PS5		0812176-17 GS090106-3PS6	
0812176-18 GS090106-3PS7		0812177-1 GS090106-3PS8	
0812177-4 GS090106-3PS9		0812177-8 GS090106-3PS10	
0812177-9 GS090106-3PS11		0812177-11 GS090106-3PS12	
0812177-12 GS090106-3PS13		0812177-14 GS090106-3PS14	

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Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: GS090106-3

0812177-15 GS090106-3PS15		0812177-17 GS090106-3PS16	
0812177-18 GS090106-3PS17		0812177-19 GS090106-3PS18	
0812177-19DUP GS090106-3PS19		0812177-20 GS090106-3PS20	
0812178-3 GS090106-3PS21		0812212-17 GS090106-3PS22	
GS090106-3MB GS090106-3PS23		GS090106-3LCS GS090106-3PS24	

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: GS090106-3

Prep Procedure: Ra_226/228

Reviewed By: tde

Review Date: 1/9/2009

Non-Routine Pre-Treatment? Y / (N) Batch: NA

Prep QASS / NCR? Y / (N) NA

Prep SOP: PAI 739 Rev: 9

Prep Analyst: Steven D. White

Balance: 19

Prep Date: 12/31/2008

Balance:

Prep SOP: NONE

Matrix Class: solid

Prep Dept: GM

Sample Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Ingrowth Date/Time	Geometry	Standards	Prep Notes
1	0812176-13	SMP		92.3	92.3	Dry Weight		11		18/19/09
2	0812176-13	DUP		92.3	92.3	Dry Weight		11		
3	0812176-14	SMP		103.2	103.2	Dry Weight		11		
4	0812176-15	SMP		108.2	108.2	Dry Weight		11		
5	0812176-16	SMP		102.9	102.9	Dry Weight		11		
6	0812176-17	SMP		93.6	93.6	Dry Weight		11		
7	0812176-18	SMP		98.6	98.6	Dry Weight		11		
8	0812177-1	SMP		96	96	Dry Weight		11		
9	0812177-4	SMP		93.7	93.7	Dry Weight		11		
10	0812177-8	SMP		109.2	109.2	Dry Weight		11		
11	0812177-9	SMP		104	104	Dry Weight		11		
12	0812177-11	SMP		81.9	81.9	Dry Weight		11		
13	0812177-12	SMP		83.8	83.8	Dry Weight		11		
14	0812177-14	SMP		85.3	85.3	Dry Weight		11		
15	0812177-15	SMP		84.8	84.8	Dry Weight		11		
16	0812177-17	SMP		88.5	88.5	Dry Weight		11		
17	0812177-18	SMP		109.1	109.1	Dry Weight		11		
18	0812177-19	SMP		78.7	78.7	Dry Weight		11		
19	0812177-19	DUP		91.5	91.5	Dry Weight		11		
20	0812177-20	SMP		100.8	100.8	Dry Weight		11		
21	0812178-3	SMP		91	91	Dry Weight		11		
22	0812212-17	SMP		78.2	78.2	Dry Weight		11		
23	GS090106-3	MB		94.0619	94.0619	Dry Weight		11		
24	GS090106-3	LCS		100	100	Dry Weight		11	S1	

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: GS090106-3

Prep Procedure: Ra_226/228

Reviewed By: tde *1DE* Review Date: 1/9/2009

Non-Routine Pre-Treatment? Y / ☒ N Batch: *NA* Re-Prep? Y / ☒ N Batch: *NA* Prep QASS / NCR? Y / ☒ N *NA*

Prep SOP: PAI 739 Rev: 9

Prep Analyst: Steven D. White *SDW*

Balance: 19

Prep Date: 12/31/2008

Balance:

Matrix Class: solid

Prep Dept: GM

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq	Fin Alq	Prep Basis	Ingrowth Date/Time	Geometry	Standards	Prep Notes
					g	g					

Comments

Spiked By: *N/A* Date: *N/A*

Witnessed By: *N/A* Date: *N/A*

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Am-241	826	2,188,991	DPM/g	12/31/08	100 g
S1	Co-60	826	1,019,129	DPM/g	12/31/08	100 g
S1	Cs-137	826	830,488	DPM/g	12/31/08	100 g

Gamma Spectroscopy Prep Worksheet

Batch ID: 65090106-3 Top Load Balance No: 1619 Math Checked: PW

Analyst: SW Oven No: 1

Prep. Date: 12/31/08 Date/Time In Oven: 12/19 @ 1555

SOP: 739R Date/Time Out Oven: 12/24 @ 1300

Work Order Number	Sample Number	Client Sample ID	Collection Date	Sample + Jar (G)	Jar (G)	Sample Aliquot (G)	Geometry	Remarks
	B1	Blank		N/A	N/A			
0812176	13	See Work Order	See Work Order	146.3	48.0	92.3	11	None
	14			152.6	49.4	103.2		Countdown
	15			157.1	48.9	108.2		None
	16			151.4	48.5	102.9		
	17			142.7	49.1	93.6		
	18			146.9	48.3	98.6		
	01			145.3	49.3	96.0		
0812177	04			143.3	49.6	93.7		
	08			158.1	48.9	109.2		
	09			152.3	48.3	104.0		
	11			131.3	49.4	81.9		
	12			132.4	48.6	83.8		
	14			134.6	49.3	85.3		
	15			133.4	48.6	84.8		
	17			137.0	48.5	88.5		
	18			157.9	48.8	109.1		
	19			126.8	48.1	78.7		
	19D			141.3	49.8	91.5		
	20			149.5	48.7	100.8		
0812178	03			139.8	48.8	91.0		
0812212	17			126.1	47.9	78.2		
					78.19/09			

count 1-14 / 2 - 2

Radiochemistry Instrument Worksheet

Prep Batch: GS090109-3

ALS Paragon

Prep Procedure: Ra_226/228

Analytical QASS / NCR? Y (N) NA

Prep Num	Lab ID	QC Type	Init Aliq	Fin Aliq	Units	Report Units	Cnt 1 File Cnt Dur (min)	Cnt 1 Inst/Det	Cnt 1 Count Date	Cnt 2 File Cnt Dur (min)	Cnt 2 Inst/Det	Cnt 2 Count Date	Cnt 3 File Cnt Dur (min)	Cnt 3 Inst/Det	Cnt 3 Count Date	Notes
1	0812177-2	SMP	202.5	202.5	g	pCi/g	30	2	1-15-09							
1	0716/08 08:30	DUP	202.5	202.5	g	pCi/g		8								Count dup.
1	0716/08 08:30				g	pCi/g		3								
1	0812177-3	SMP	187.7	187.7	g	pCi/g		2								
1	0716/08 09:08				g	pCi/g		3								
1	0812177-5	SMP	202.8	202.8	g	pCi/g		2								
1	0716/08 09:26				g	pCi/g		3								
1	0812177-6	SMP	207.6	207.6	g	pCi/g		2								
1	0716/08 09:26				g	pCi/g		3								
1	0812177-7	SMP	186.1	186.1	g	pCi/g		2								
1	0716/08 09:45				g	pCi/g		3								
1	0812177-10	SMP	207.4	207.4	g	pCi/g		8								
1	0716/08 09:54				g	pCi/g		2								
1	0812177-16	SMP	203.2	203.2	g	pCi/g		3								
1	0723/08 10:15				g	pCi/g		8								
1	0812178-1	SMP	175.3	175.3	g	pCi/g		2								
1	0711/08 13:20				g	pCi/g		3								
1	0812178-9	SMP	202.8	202.8	g	pCi/g		8								
1	0715/08 09:55				g	pCi/g		2								
1	0812178-11	SMP	200.4	200.4	g	pCi/g		3								
1	0715/08 11:21				g	pCi/g		8								
1	0812178-13	SMP	198.6	198.6	g	pCi/g		2								
1	0715/08 13:33				g	pCi/g		3								
1	0812178-15	SMP	187.9	187.9	g	pCi/g		8								
1	0714/08 13:55				g	pCi/g		2								
1	0812178-16	SMP	193.4	193.4	g	pCi/g		3								
1	0714/08 14:45				g	pCi/g		8								
1	0812178-18	SMP	171.3	171.3	g	pCi/g		3								
1	0714/08 14:55				g	pCi/g		8								
1	0812178-18	DUP	171.3	171.3	g	pCi/g		2								
1	0714/08 14:55				g	pCi/g		3								
1	GS090109-3A	LCS	215	215	g	pCi/g		8								
1	12/24/08 14:28				g	pCi/g		3								
1	GS090109-3	MB	194.79	194.79	g	pCi/g		8								
1	12/24/08 14:28				g	pCi/g		3								
1	GS090109-3	LCS	215	215	g	pCi/g		8								
1	12/24/08 14:28				g	pCi/g		3								

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	RA-226	144	1,043.924	DPM/g	12/24/08	215 g
S2	Am-241	827	1,026.646	DPM/g	12/24/08	215 g
S2	Co-60	827	479.229	DPM/g	12/24/08	215 g
S2	Cs-137	827	389.535	DPM/g	12/24/08	215 g

Radiochemistry Instrument Worksheet


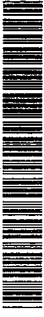




ALS Paragon

Prep Batch: GS090109-3

Reporting Units

LabID:	TstGrpName:	RptUnits:
0812178-1	Gamma_Ra-228MtPass	pCi/g
0812178-1	GAMMA_Ra226	pCi/g
0812177-2	Gamma_Ra-228MtPass	pCi/g
0812177-2	GAMMA_Ra226	pCi/g
0812177-3	Gamma_Ra-228MtPass	pCi/g
0812177-3	GAMMA_Ra226	pCi/g
0812177-5	Gamma_Ra-228MtPass	pCi/g
0812177-5	GAMMA_Ra226	pCi/g
0812177-6	Gamma_Ra-228MtPass	pCi/g
0812177-6	GAMMA_Ra226	pCi/g
0812177-7	GAMMA_Ra226	pCi/g
0812177-7	Gamma_Ra-228MtPass	pCi/g
0812178-9	GAMMA_Ra226	pCi/g
0812178-9	Gamma_Ra-228MtPass	pCi/g
0812177-10	Gamma_Ra-228MtPass	pCi/g
0812177-10	GAMMA_Ra226	pCi/g
0812178-11	GAMMA_Ra226	pCi/g
0812178-11	Gamma_Ra-228MtPass	pCi/g
0812178-13	Gamma_Ra-228MtPass	pCi/g
0812178-13	GAMMA_Ra226	pCi/g
0812178-15	GAMMA_Ra226	pCi/g
0812178-15	Gamma_Ra-228MtPass	pCi/g
0812177-16	Gamma_Ra-228MtPass	pCi/g
0812177-16	GAMMA_Ra226	pCi/g
0812178-16	Gamma_Ra-228MtPass	pCi/g
0812178-16	GAMMA_Ra226	pCi/g
0812178-18	GAMMA_Ra226	pCi/g
0812178-18	Gamma_Ra-228MtPass	pCi/g

Sample Barcodes




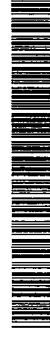

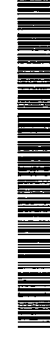


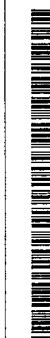




0812177-2 GS090109-3PS1		0812177-2DUP GS090109-3PS2	
0812177-3 GS090109-3PS3		0812177-5 GS090109-3PS4	
0812177-6 GS090109-3PS5		0812177-7 GS090109-3PS6	

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Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: GS090109-3

0812177-10 GS090109-3PS7		0812177-16 GS090109-3PS8	
0812178-1 GS090109-3PS9		0812178-9 GS090109-3PS10	
0812178-11 GS090109-3PS11		0812178-13 GS090109-3PS12	
0812178-15 GS090109-3PS13		0812178-16 GS090109-3PS14	
0812178-18 GS090109-3PS15		0812178-18DUP GS090109-3PS16	
GS090109-3ALCS GS090109-3PS18		GS090109-3MB GS090109-3PS17	
GS090109-3LCS GS090109-3PS18			

Radiochemistry Prep Worksheet

Prep Batch: GS090109-3

ALS Paragon

Prep Procedure: Ra_226/228

Reviewed By: sdw *sdw* Review Date: 1/12/2009

Non-Routine Pre-Treatment? Y / *N* Batch: *MA*

Re-Prep? Y / *N* Batch: *MA*

Prep QASS / NCR? Y / *N* *MA*

Prep SOP: PAI 739 Rev: 9

Prep Analyst: Steven D. White *sdw*

Balance: 15

Prep Date: 12/24/2008

Balance:

Matrix Class: solid

Prep Dept: GM

Sample Prep Num	LabID	QC Type	Dish No.	Init Aliq g	Fin Aliq g	Prep Basis	Ingrowth Date/Time	Geometry	Standards	Prep Notes
1	0812177-2	SMP		202.5	202.5	Dry Weight		17	126	Count Duplicate; Insufficient Sample
2	0812177-2	DUP		202.5	202.5	Dry Weight		17		
3	0812177-3	SMP		187.7	187.7	Dry Weight		17		
4	0812177-5	SMP		202.8	202.8	Dry Weight		17		
5	0812177-6	SMP		207.6	207.6	Dry Weight		17		
6	0812177-7	SMP		186.1	186.1	Dry Weight		17		
7	0812177-10	SMP		207.4	207.4	Dry Weight		17		
8	0812177-16	SMP		203.2	203.2	Dry Weight		17		
9	0812178-1	SMP		175.3	175.3	Dry Weight		17		
10	0812178-9	SMP		202.8	202.8	Dry Weight		17		
11	0812178-11	SMP		200.4	200.4	Dry Weight		17		
12	0812178-13	SMP		198.6	198.6	Dry Weight		17		
13	0812178-15	SMP		187.9	187.9	Dry Weight		17		
14	0812178-16	SMP		193.4	193.4	Dry Weight		17		
15	0812178-18	SMP		171.3	171.3	Dry Weight		17		
16	0812178-18	DUP		171.3	171.3	Dry Weight		17		Count Duplicate; Insufficient Sample
17	GS090109-3A	LCS		215	215	Dry Weight		26	S1	
18	GS090109-3	MB		194.7857	194.7857	Dry Weight		17	126	
19	GS090109-3	LCS		215	215	Dry Weight		17	S2	

Comments

Spiked By: N/A Date: N/A

Witnessed By: N/A Date: N/A

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	RA-226	144	1,043.924	DPM/g	12/24/08	215 g
S2	Am-241	827	1,026.646	DPM/g	12/24/08	215 g
S2	Co-60	827	479.229	DPM/g	12/24/08	215 g
S2	Cs-137	827	389.535	DPM/g	12/24/08	215 g

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Gamma Spectroscopy Prep Worksheet

Batch ID: G5090109-3

Analyst: SPW

Prep. Date: 12-24-2009

SOP: 739 R 9

Top Load Balance No: 15 · Math Checked: Saw 1-9-09

Oven No; 18.

Date/Time In Oven: 12/18/08 1555

Date/Time Out Oven: 12/24/08 @ 1300

caned/packed
on 12/24/08

[illegible]



Section 8

STANDARDS TRACEABILITY DOCUMENTS





Analytics, Inc.
1380 Seaboard Industrial Boulevard
Atlanta, Georgia 30318
404 352-8677

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

ATI ID 0144
Sec'd 12-12-95

51290-307

Ra-226 Sand in Steel Can

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a calibrated master radionuclide solution source which was calibrated using a germanium gamma spectrometer system. This calibration has been confirmed by the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system and alpha spectroscopy system. The nuclear decay rate and assay date for this source are given below.

ISOTOPE:	Ra-226
ACTIVITY (dps):	3762
HALF-LIFE:	1600 years
CALIBRATION DATE:	December 11, 1995 12:00 EST
TOTAL ERROR:	4.9%
SYSTEMATIC ERROR:	3.5%
RANDOM ERROR:	1.4%

215 grams of sand. 2 1/8" OD X 2 7/8" H.

P O NUMBER 51393, Item 1

SOURCE PREPARED BY:

M. D. Currie
Mr. D. Currie, Radiochemist

Q A APPROVED:

Dr. M. M. 12-11-95

Source re-verified on 6/13/2007.
Expires: 6/13/2008.

RG 7/17/07

Source re-verified on 6/17/2008.
Expires: 6/17/2009 to 6/18/08

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

73489-307 *RSO #826* *Rec'd 8/29/06*
DUS

100 Grams Sand in 16 Ounce PP MRP Jar

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1315	3.0
Cd-109	88	462.6 d	1861	3.3
Co-57	122	271.79 d	978.8	3.0
Ce-139	166	137.6 d	1383	2.8
Hg-203	279	46.61 d	3069	2.7
Sn-113	392	115.1 d	1958	2.6
Cs-137	662	30.07 y	1248	3.0
Y-88	898	106.6 d	4827	2.6
Co-60	1173	5.2714 y	2362	2.7
Co-60	1332	5.2714 y	2360	2.6
Y-88	1836	106.6 d	5052	2.6

55 mL/100.05 grams of customer supplied sand.
P O NUMBER 71239, Rel. 7/31/06, Item 3

SOURCE PREPARED BY: *M. Taskaeva*
M. Taskaeva, Radiochemist

Q A APPROVED: *MMT* 8-24-06

This standard will expire one year after the calibration date.

SOURCE RE-VERIFIED 07-25-08

EXPIRATION DATE = 07-25-09

MC
09-10-08

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

73490-307

RSO#827 Rec'd 8/29/06
805

215 Grams Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytix maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1326	3.0
Cd-109	88	462.6 d	1876	3.3
Co-57	122	271.79 d	987.1	3.0
Ce-139	166	137.6 d	1394	2.8
Hg-203	279	46.61 d	3095	2.7
Sn-113	392	115.1 d	1975	2.6
Cs-137	662	30.07 y	1258	3.0
Y-88	898	106.6 d	4868	2.6
Co-60	1173	5.2714 y	2382	2.7
Co-60	1332	5.2714 y	2380	2.6
Y-88	1836	106.6 d	5095	2.6

140 mL/215.02 grams of customer supplied sand.
P O NUMBER 71239, Rel. 7/31/06, Item 4

SOURCE PREPARED BY: *M. Taskaeva*
M. Taskaeva, Radiochemist

Q A APPROVED: *M. Taskaeva* 8-24-06

This standard will expire one year after the calibration date.

SOURCE RE-VERIFIED 07-28-08.

NEW EXPIRATION DATE = 07-28-09.

MC
09-10-08



Section 9

ADDITIONAL SUPPORTING DOCUMENTATION



Gamma Spectroscopy

Initial Calibration Standards Traceability

080821D02.SPC Analyzed by *jo*

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 13 / Solid

Sample ID: 0813514-2 FWHM CAL (855)

Sampling Start: 01/01/2008 10:00:00 | Counting Start: 05/08/2008 10:01:31
Sampling Stop: 01/01/2008 10:00:00 | Decay Time. 3.07E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 2700 Sec
Sample Size 5.00E+002 g | Real Time 2813 Sec
Collection Efficiency 1.0000 | Spc. File 080821D02.SPC

Detector #: 2 (Detector 2)

Energy(keV) = -0.63 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/08/2008

FWHM(keV) = 0.69 + 0.005*En + 9.43E-04*En^2 + 0.00E+00*En^3 05/07/2007

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.55	120.19	15662	365	219	9662	0.77	a
2	70.80	142.65	432	209	168	6977	0.54	a
3	72.98	147.01	905	298	240	11628	0.76	b
4	88.01	177.03	71668	611	243	11890	0.83	a
5	122.12	245.14	46797	508	219	9654	0.86	a
6	136.55	273.97	6218	325	233	10056	0.91	a
7	165.89	332.56	49762	518	217	8715	0.93	a
8	250.38	501.31	87	134	109	2930	0.50	a NET< CL
9	255.16	510.86	1487	229	177	5791	0.97	a
10	279.24	558.95	25239	388	184	5753	1.09	a
11	310.41	621.20	127	184	150	4171	0.91	a NET< CL
12	391.78	783.72	36384	423	151	3865	1.23	a
13	476.39	952.69	81	128	104	2476	0.76	a NET< CL
14	510.91	1021.64	936	264	211	5994	2.34	a Wide Pk
15	512.12	1024.05	68	242	199	5566	2.07	b NET< CL
16	661.78	1322.95	33318	407	148	3796	1.52	a HiResid
17	725.81	1450.83	178	192	156	3608	2.03	a
18	766.49	1532.08	90	95	76	1439	0.84	a
19	813.76	1626.49	543	147	114	2540	1.47	a
20	898.18	1795.09	42041	441	133	3133	1.88	a HiResid
21	1173.35	2344.66	37868	409	104	1901	2.12	a HiResid
22	1325.13	2647.79	894	139	103	1565	2.91	a HiResid
23	1332.57	2662.65	35119	390	89	1304	2.43	b HiResid
24	1836.01	3668.11	25476	325	50	377	3.00	a HiResid

 SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813514-2 FWHM CAL (855)

Stds. Match Tolerance: 2.00 keV

 Detector Number: 02 Calibration Date. . . 05/08/2008 10:01:31

FWHM(keV) = $0.69 + 0.003 \cdot \text{En} + 1.19 \times 10^{-3} \cdot \text{En}^2 + 0.00 \times 10^0 \cdot \text{En}^3$
 (Where En = SQR(Energy in keV))

Pk. #	Energy (keV)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(keV)
1	59.50	0.770	1.78	0.784	-0.50	0.780
2	88.04	0.833	-1.19	0.823	-0.98	0.815
3	122.06	0.864	0.44	0.868	-1.58	0.855
4	165.85	0.925	0.04	0.926	-2.33	0.905
5	279.00	1.089	-1.65	1.071	-4.12	1.029
6	391.68	1.226	-0.93	1.215	-5.64	1.150
7	661.64	1.517	2.31	1.553	-8.47	1.432
8	898.02	1.882	-1.91	1.847	-10.30	1.675
9	1173.21	2.120	3.06	2.187	-11.93	1.954
10	1332.48	2.432	-2.03	2.383	-12.70	2.115
11	1836.01	3.000	0.05	3.001	-14.60	2.619

Calibration Results Saved.

OK
 MC
 5/9/08

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

RSO# 855

76484A-307
Sand in 16 Ounce PP MRP Jar

Customer: Paragon Analytics / Fort Collins, CO
P.O. No.: 72905 REL 12-13-07, Item 3

Calibration Date: 01-Jan-2008 12:00 EST **Grams of Master Source:** 0.011313

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty, %			Calibration Method
					Type	u _A	u _B	U
Am-241	59.5	157860	—	1.322E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.671E+05	1.890E+03	0.9	1.7	3.8	HPGe
Co-57	122.1	271.79	8.639E+04	9.773E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.219E+05	1.379E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	46.61	2.884E+05	3.263E+03	0.5	1.1	2.4	HPGe
Sn-113	391.7	115.1	1.718E+05	1.944E+03	0.6	1.1	2.5	HPGe
Cs-137	661.7	10983	1.095E+05	1.239E+03	0.2	1.2	2.4	HPGe
Y-88	898.0	106.6	4.140E+05	4.684E+03	0.7	1.1	2.6	HPGe
Co-60	1173.2	1925.4	2.071E+05	2.343E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.072E+05	2.344E+03	0.9	1.1	2.8	HPGe
Y-88	1836.1	106.6	4.376E+05	4.951E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

500 grams / 290 mL of customer supplied sand.

This standard will expire one year after the calibration date.

Source Prepared by:

M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved:

D. M. Montgomery
D. M. Montgomery, QA Manager

Date:

1-23-08

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0813514-3 FWHM CAL (849)

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Sampling Start: 07/01/2007 10:00:00 | Counting Start: 02/29/2008 12:38:59
Sampling Stop: 07/01/2007 10:00:00 | Decay Time. . . . . 5.83E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 3600 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 3790 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080003D03.SPC
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Detector #: 3 (Detector 3)

Energy(keV) = -1.24 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 02/29/2008

FWHM(keV) = 0.85 + 0.006*En + 1.31E-03*En^2 + 0.00E+00*En^3 10/27/2007

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.52	121.34	49365	626	362	22408	1.10 a	
2	88.01	178.23	172237	942	366	22830	1.12 a	HiResid
3	122.10	246.32	103183	739	301	15437	1.12 a	HiResid
4	136.54	275.16	13357	400	268	12252	1.15 a	
5	165.88	333.75	81801	653	258	11388	1.20 a	
6	255.22	512.18	2325	299	233	9999	1.28 a	
7	279.25	560.17	10396	338	222	9104	1.25 a	
8	311.09	623.76	267	232	189	7025	1.18 a	
9	391.74	784.84	49154	515	216	8132	1.40 a	
10	511.46	1023.95	353	204	165	5566	1.32 a	
11	661.69	1323.98	86367	621	165	5720	1.55 a	HiResid
12	813.96	1628.08	790	199	157	4979	1.57 a	
13	820.96	1642.07	265	207	169	5477	1.79 b	
14	898.08	1796.09	49308	497	184	6516	1.78 a	
15	1173.26	2345.66	87655	612	128	3027	1.98 a	HiResid
16	1325.33	2649.37	1235	182	138	2473	3.65 a	HiResid
17	1332.43	2663.56	79724	575	91	1461	2.11 b	HiResid
18	1835.86	3669.00	28847	346	53	461	2.48 a	HiResid

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 SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813514-3 FWHM CAL (849)

Stds. Match Tolerance: 2.00 keV

 Detector Number: 03 Calibration Date. . . 02/29/2008 12:38:59

 FWHM(keV) = $1.02 + 0.003 \cdot \text{En} + 7.23 \times 10^{-4} \cdot \text{En}^2 + 0.00 \times 10^0 \cdot \text{En}^3$
 (Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	1.100	-0.97	1.089	0.00	1.089
2	88.04	1.118	-0.27	1.115	0.00	1.115
3	122.06	1.122	2.03	1.145	0.00	1.145
4	165.85	1.201	-1.55	1.183	0.00	1.183
5	279.00	1.247	2.37	1.277	0.00	1.277
6	391.68	1.400	-2.31	1.369	0.00	1.369
7	661.64	1.555	1.81	1.583	0.00	1.583
8	898.02	1.783	-0.82	1.768	0.00	1.768
9	1173.21	1.983	-0.10	1.981	0.00	1.981
10	1332.48	2.115	-0.51	2.104	0.00	2.104
11	1836.01	2.480	0.35	2.489	0.00	2.489

Calibration Results Saved.



Eckert & Ziegler

Analytics

RSO# 849
rec 7-23-07

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404.352.8677
Fax 404.352.2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

75356-307

100 Grams of Sand in 16 Ounce PP MRP Jar

Customer: Paragon Analytics

P.O. No.: 72905, Item 3

Calibration Date: 01-Jul-2007 12:00 EST **Grams of Master Source:** 0.011387

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty, %			Calibration Method
					u _A	u _B	U	
Am-241	59.5	157860	—	1.374E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.657E+05	1.887E+03	0.9	1.7	3.8	HPGe
Co-57	122.1	271.79	8.714E+04	9.923E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.237E+05	1.409E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	46.61	2.588E+05	2.947E+03	0.5	1.1	2.4	HPGe
Sn-113	391.7	115.1	1.737E+05	1.978E+03	0.6	1.1	2.5	HPGe
Cs-137	661.7	10983	1.109E+05	1.263E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.154E+05	4.730E+03	0.7	1.1	2.6	HPGe
Co-60	1173.2	1925.4	2.050E+05	2.334E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.054E+05	2.339E+03	0.9	1.1	2.8	HPGe
Y-88	1836.1	106.6	4.398E+05	5.008E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

55 mL / 100 grams of customer supplied sand.

This standard will expire one year after the calibration date.

Source Prepared by: N. E. Kiesman
N. E. Kiesman, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 7-19-07

End of Certificate

Corporate Office

Laboratory

227 of 412

24937 Avenue Tibbitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 13 / Solid

Sample ID: 0813514-6 FWHM CAL (855)

 Sampling Start: 01/01/2008 10:00:00 | Counting Start: 07/25/2008 10:15:36
 Sampling Stop: 01/01/2008 10:00:00 | Decay Time. 4.94E+003 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 5400 Sec
 Sample Size 5.00E+002 g | Real Time 5558 Sec
 Collection Efficiency 1.0000 | Spc. File 081285D06.SPC

Detector #: 6 (Detector 6)

Energy(keV) = -0.55 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 07/25/2008

FWHM(keV) = 0.79 + 0.009*En + 6.42E-04*En^2 + 0.00E+00*En^3 07/24/2007

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.45	119.97	15413	378	235	11114	0.87 a	
2	87.96	176.96	88852	694	292	17192	0.89 a	
3	122.01	245.05	61225	601	280	14514	0.94 a	HiResid
4	136.40	273.82	8064	366	262	12678	0.98 a	
5	165.79	332.58	54940	556	245	11125	1.00 a	
6	186.32	373.63	287	281	230	9733	0.99 a	
7	255.11	511.16	1553	262	205	7794	1.01 a	
8	257.84	516.61	118	154	126	3897	0.55 b	NET< CL
9	279.13	559.19	13473	351	216	7987	1.09 a	
10	391.64	784.13	38452	444	171	5753	1.22 a	
11	511.13	1023.04	992	296	237	7940	2.15 a	Wide Pk
12	598.60	1197.93	114	134	109	2694	0.85 a	
13	661.52	1323.72	55767	515	170	5004	1.45 a	
14	813.80	1628.18	794	178	139	3772	1.46 a	
15	897.90	1796.34	42335	455	160	4754	1.63 a	HiResid
16	1115.65	2231.69	81	113	92	1957	0.92 a	NET< CL
17	1173.01	2346.38	61907	515	108	2243	1.87 a	HiResid
18	1324.52	2649.30	896	141	105	1687	2.70 a	HiResid
19	1332.25	2664.76	56788	486	80	1191	2.01 b	HiResid
20	1835.61	3671.15	25911	327	45	336	2.37 a	HiResid

081285D06.SPC Analyzed by

SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813514-6 FWHM CAL (855)

Stds. Match Tolerance: 2.00 keV

Detector Number: 06 Calibration Date. . . 07/25/2008 10:15:36

FWHM(keV) = $0.73 + 0.012 \cdot \text{En} + 6.10\text{e-}04 \cdot \text{En}^2 + 0.00\text{e+}00 \cdot \text{En}^3$
(Where En = SQR(Energy in keV))

Pk. #	Energy (keV)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(keV)
1	59.50	0.865	-0.75	0.859	4.77	0.902
2	88.04	0.891	0.63	0.897	4.08	0.935
3	122.06	0.935	0.35	0.938	3.43	0.972
4	165.85	0.999	-1.12	0.988	2.79	1.016
5	279.00	1.088	1.55	1.105	1.66	1.123
6	391.68	1.220	-0.63	1.212	0.94	1.223
7	661.64	1.453	-0.16	1.451	-0.04	1.450
8	898.02	1.635	0.79	1.648	-0.48	1.640
9	1173.21	1.873	-0.19	1.869	-0.75	1.855
10	1332.48	2.011	-0.85	1.994	-0.85	1.978
11	1836.01	2.372	0.36	2.381	-0.97	2.358

Calibration Results Saved.

OK
MC
7/25/08

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

RSO# 855

76484A-307
Sand in 16 Ounce PP MRP Jar

Customer: Paragon Analytics / Fort Collins, CO
P.O. No.: 72905 REL 12-13-07, Item 3
Calibration Date: 01-Jan-2008 12:00 EST **Grams of Master Source:** 0.011313

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty , %			Calibration Method
					Type	u _A	u _B		U
Am-241	59.5	157860	————	1.322E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.671E+05	1.890E+03	0.9	1.7	3.8	HPGe
Co-57	122.1	271.79	8.639E+04	9.773E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.219E+05	1.379E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	46.61	2.884E+05	3.263E+03	0.5	1.1	2.4	HPGe
Sn-113	391.7	115.1	1.718E+05	1.944E+03	0.6	1.1	2.5	HPGe
Cs-137	661.7	10983	1.095E+05	1.239E+03	0.2	1.2	2.4	HPGe
Y-88	898.0	106.6	4.140E+05	4.684E+03	0.7	1.1	2.6	HPGe
Co-60	1173.2	1925.4	2.071E+05	2.343E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.072E+05	2.344E+03	0.9	1.1	2.8	HPGe
Y-88	1836.1	106.6	4.376E+05	4.951E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

500 grams / 290 mL of customer supplied sand.
This standard will expire one year after the calibration date.

Source Prepared by: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 1-23-08

End of Certificate

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 13 / Solid

Sample ID: 0813514-8 FWHM CAL (855)

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Sampling Start:   01/01/2008 10:00:00 | Counting Start:   06/13/2008 11:21:15
Sampling Stop:    01/01/2008 10:00:00 | Decay Time. . . . . 3.94E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 2700 Sec
Sample Size . . . . . 5.00E+002 g | Real Time . . . . . 2851 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 081171D08.SPC
-----

```

Detector #: 8 (Detector 8)

Energy(keV) = -1.45 + 0.501*Ch + 1.85E-07*Ch^2 + 0.00E+00*Ch^3 06/13/2008

FWHM(keV) = 0.61 + 0.011*En + 6.87E-04*En^2 + 0.00E+00*En^3 06/13/2007

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	48.38	99.52	487	174	138	5291	0.40	a
2	49.60	101.96	2032	430	346	20393	1.14	b
3	59.67	122.08	86174	715	335	20747	0.74	
4	65.71	134.15	-363	415	343	20017	1.62	NET< CL
5	67.31	137.35	592	294	239	12619	1.15	
6	70.96	144.63	-936	407	338	21165	2.17	NET< CL
7	73.06	148.82	750	354	287	16644	0.45	
8	85.57	173.80	1196	662	542	38267	1.75	a Wide Pk
9	88.19	179.05	112730	743	262	13845	0.77	b
10	122.18	246.93	49281	507	201	8134	0.81	a
11	136.58	275.70	6033	268	180	6498	0.85	a
12	166.00	334.44	40009	449	167	5609	0.86	a
13	199.29	400.94	577	190	152	4627	0.79	a
14	203.76	409.86	222	239	195	6477	1.13	b
15	255.26	512.70	1149	175	133	3560	0.84	a
16	279.34	560.79	13791	291	142	3700	0.99	a
17	391.87	785.46	26698	367	137	3224	1.10	a
18	510.51	1022.29	399	204	164	3999	1.93	a Wide Pk
19	511.95	1025.18	295	216	175	4332	2.19	b
20	661.98	1324.61	30026	376	119	2614	1.35	a
21	814.27	1628.50	486	137	107	1989	1.44	a
22	898.37	1796.29	29906	374	116	2492	1.58	a
23	933.16	1865.67	66	88	71	1255	0.80	a NET< CL
24	1173.70	2345.44	34164	384	86	1287	1.81	a

=====

PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1325.44	2648.01	724	134	101	1331	3.54	a Wide Pk
26	1332.97	2663.01	30990	360	63	726	1.93	b
27	1836.68	3666.88	18340	274	35	205	2.35	a HiResid

081171D08.SPC Analyzed by

SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813514-8 FWHM CAL (855)
Stds. Match Tolerance: 2.00 keV

Detector Number: 08 Calibration Date. . . 06/13/2008 11:21:15

FWHM(keV) = 0.59 + 0.013*En + 6.62e-04*En^2 + 0.00e+00*En^3
(Where En = SQR(Energy in keV))

Pk. #	Energy (keV)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(keV)
1	59.50	0.728	-0.15	0.727	1.95	0.741
2	88.04	0.774	-0.92	0.767	1.55	0.779
3	122.06	0.811	-0.02	0.811	1.21	0.821
4	165.85	0.856	0.95	0.864	0.88	0.871
5	279.00	0.987	0.14	0.988	0.36	0.992
6	391.68	1.099	0.33	1.103	0.08	1.103
7	661.64	1.354	0.26	1.358	-0.23	1.355
8	898.02	1.579	-0.61	1.569	-0.30	1.564
9	1173.21	1.814	-0.43	1.807	-0.31	1.801
10	1332.48	1.934	0.35	1.941	-0.29	1.936
11	1836.01	2.354	0.09	2.356	-0.18	2.352

Calibration Results Saved.

OK
MC
6/13/08

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

RSO# 855

76484A-307
Sand in 16 Ounce PP MRP Jar

Customer: Paragon Analytics / Fort Collins, CO
P.O. No.: 72905 REL 12-13-07, Item 3
Calibration Date: 01-Jan-2008 12:00 EST **Grams of Master Source:** 0.011313

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty, %			Calibration Method
					Type	u _A	u _B	U
Am-241	59.5	157860	—	1.322E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.671E+05	1.890E+03	0.9	1.7	3.8	HPGe
Co-57	122.1	271.79	8.639E+04	9.773E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.219E+05	1.379E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	46.61	2.884E+05	3.263E+03	0.5	1.1	2.4	HPGe
Sn-113	391.7	115.1	1.718E+05	1.944E+03	0.6	1.1	2.5	HPGe
Cs-137	661.7	10983	1.095E+05	1.239E+03	0.2	1.2	2.4	HPGe
Y-88	898.0	106.6	4.140E+05	4.684E+03	0.7	1.1	2.6	HPGe
Co-60	1173.2	1925.4	2.071E+05	2.343E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.072E+05	2.344E+03	0.9	1.1	2.8	HPGe
Y-88	1836.1	106.6	4.376E+05	4.951E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

500 grams / 290 mL of customer supplied sand.
This standard will expire one year after the calibration date.

Source Prepared by: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 1-23-08

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0813514-9 FWHM CAL (849)

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Sampling Start: 07/01/2007 10:00:00 | Counting Start: 01/14/2008 15:32:34
Sampling Stop: 07/01/2007 10:00:00 | Decay Time. . . . . 4.73E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 1984 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080005D09.SPC
-----

```

Detector #: 9 (Detector 9)

Energy(keV) = 1.18 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/14/2008

FWHM(keV) = 0.54 + 0.019*En + 5.56E-04*En^2 + 0.00E+00*En^3 01/14/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

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=====
PK.   ENERGY   ADDRESS   NET/MDA   UN-   C.L.   BKG   FWHM
#     (keV)     CHANNEL   COUNTS   CERTAINTY  COUNTS  COUNTS (keV)  FLAG
-----
 1    49.47      96.63      3663      504      403    25686  1.23 a Wide Pk
 2    59.49     116.69    147960      815      222    10935  0.68 a HiResid
 3    65.89     129.49     1088      344      277    13118  1.21 a HiResid
                        Wide Pk
 4    67.22     132.15     4184      588      471    25936  2.20 b HiResid
 5    70.52     138.77     4514      623      500    29204  2.09 c HiResid
 6    72.78     143.29     1032      307      247    12326  0.85 d HiResid
 7    78.34     154.41       382      167      134     4945  0.39 a
 8    87.98     173.70    149017      809      198     8686  0.69 a HiResid
 9   122.13     242.06    66413      551      161     5205  0.84 a HiResid
10   136.55     270.90     8010      253      147     4364  0.86 a
11   165.92     329.68    47182      474      155     4463  0.90 a
12   199.20     396.28     1264      197      151     4232  0.90 a
13   203.79     405.47       233      117       93     2116  0.52 b
14   255.23     508.42     1248      177      134     3303  1.05 a
15   279.29     556.56     8950      244      127     2973  1.00 a
16   298.56     595.14        58       91       74     1353  0.52 a NET< CL
17   391.82     781.77    26334      357      123     2567  1.15 a HiResid
18   510.91    1020.09       371      229      186     4440  2.53 a Wide Pk
19   511.76    1021.81       115      114       92     1776  0.92 b
20   541.36    1081.03        70       95       77     1351  0.83 a NET< CL
21   661.71    1321.89    32900      393      124     2670  1.40 a HiResid
22   734.81    1468.18        83      175      144     2901  2.10 a NET< CL
23   813.84    1626.33       516      135      105     2029  1.59 a
-----

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PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	898.15	1795.07	24441	345	120	2655	1.58	a HiResid
25	1173.33	2345.77	33220	377	79	1212	1.85	a HiResid
26	1324.99	2649.29	590	122	92	1136	3.43	a HiResid Wide Pk
27	1332.61	2664.52	29852	353	59	649	1.99	b HiResid
28	1836.06	3672.06	13779	239	38	249	2.34	a HiResid

SEEKER

C A L I B R A T I O N R E S U L T S Version 2.0.4

Sample ID: 0813514-9 FWHM CAL (849)

Stds. Match Tolerance: 2.00 keV

Detector Number: 09Calibration Date. . . 01/14/2008 15:32:34

FWHM(keV) = 0.46 + 0.026*En + 4.17e-04*En^2 + 0.00e+00*En^3

(Where En = SQR(Energy in keV))

Pk. #	Energy (kev)	Measured FWHM(keV)	% Diff.	Calculated FWHM(keV)	% Diff.	Prev.Calc. FWHM(kev)
1	59.50	0.681	0.46	0.684	5.03	0.720
2	88.04	0.686	7.32	0.740	3.58	0.767
3	122.06	0.839	-5.13	0.798	2.39	0.817
4	165.85	0.900	-4.18	0.864	1.33	0.876
5	279.00	0.998	1.32	1.012	-0.18	1.010
6	391.68	1.152	-1.06	1.140	-0.85	1.130
7	661.64	1.402	0.48	1.408	-1.24	1.391
8	898.02	1.584	2.15	1.618	-1.04	1.602
9	1173.21	1.849	-0.20	1.846	-0.60	1.835
10	1332.48	1.994	-1.14	1.971	-0.30	1.965
11	1836.01	2.345	0.13	2.348	0.68	2.364

Calibration Results Saved.

MC
1/15/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0813508-3 GEO 11 EFF CAL (849)

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-----
Sampling Start: 07/01/2007 10:00:00 | Counting Start: 05/28/2008 09:55:11
Sampling Stop: 07/01/2007 10:00:00 | Decay Time. . . . . 7.97E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 3600 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 3830 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080345D03.SPC
-----
```

Detector #: 3 (Detector 3)

Energy(keV) = -1.33 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/28/2008

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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=====
PK.   ENERGY ADDRESS  NET/MDA  UN-   C.L.   BKG   FWHM
#     (keV)  CHANNEL  COUNTS  CERTAINTY  COUNTS  COUNTS (keV)  FLAG
-----
 1    59.49   121.46   48648    575     303   16960   1.03 a
 2    86.11   174.60    3408    726     589   40515   2.13 a Wide Pk
 3    87.96   178.30  147931    849     296   16213   1.05 b
 4   122.06   246.39   81437    656     266   12075   1.08 a HiResid
 5   136.47   275.17  10900    355     236    9511   1.13 a
 6   165.83   333.80   51457    521     211    8780   1.16 a
 7   255.13   512.11    1436    271     214    8462   1.31 a
 8   279.10   559.96    2620    246     184    6672   1.12 a
 9   391.71   784.83   28365    405     186    6369   1.38 a
10   511.27  1023.56     392    217     175    5355   1.54 a
11   661.70  1323.94   84282    614     165    5032   1.67 a HiResid
12   692.09  1384.61    195    242     198    6270   2.13 a NET< CL
13   813.93  1627.91    312    166     133    3651   1.36 a
14   898.12  1796.01   27275    407     196    6470   1.92 a
15  1173.29  2345.48   82366    594     127    2857   2.10 a HiResid
16  1218.99  2436.73     57    113     92    1496   2.15 a NET< CL
17  1326.16  2650.72   1024    235     186    3069   6.26 a HiResid
                               Wide Pk
18  1332.50  2663.38   75949    560     81    1131   2.35 b HiResid
19  1835.96  3668.69  15535    257     51     392   2.89 a HiResid
=====
```


080345D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File:. DET030523.BKG (080523-3 WEEKLY BACKGROUND)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
10	511.27	392	217	175	303	217	177	
12	692.09	195	242	198	183	242	198	NET<CL
14	898.12	27275	407	196	27272	407	196	

 SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813508-3 GEO 11 EFF CAL (849)
 Stds. Match Tolerance: 2.00 keV

 Detector Number: 03 Calibration Date: . . . 05/28/2008 09:55:11
 Geometry File (D03)(Sh11).EFF ID. Geo 11 Eff Cal
 Amount of Std. in Calib. Source: 100.000000 gm

Eff = 1 / [4.02e-04*En^-4.38e+00 + 7.65e+01*En^ 7.84e-01]
 (Where En = Energy in MeV) (Exponential)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	9.85e-03	0.52	9.90e-03	-0.00	9.90e-03
2	88.04	3.58e-02	-0.51	3.56e-02	0.00	3.56e-02
3	122.06	5.32e-02	0.57	5.35e-02	-0.00	5.35e-02
4	165.85	5.08e-02	-0.36	5.06e-02	-0.00	5.06e-02
5	279.00	3.44e-02	2.83	3.54e-02	0.00	3.54e-02
6	391.68	2.84e-02	-4.28	2.72e-02	0.00	2.72e-02
7	661.64	1.89e-02	-4.73	1.81e-02	0.00	1.81e-02
8	898.02	1.39e-02	2.60	1.42e-02	0.00	1.42e-02
9	1173.21	1.10e-02	4.23	1.15e-02	0.00	1.15e-02
10	1332.48	1.02e-02	2.65	1.04e-02	0.00	1.04e-02
11	1836.01	8.40e-03	-3.42	8.12e-03	0.00	8.12e-03

Calibration Results Saved.

* Manually adjusted efficiency From original value of
 6/2/08 ⁹ 2.84e-02. % difference From newly calibrated value
 of 2.72e-02 :

$$\left| \frac{2.94e-02}{2.72e-02} - 1 \right| \times 100 = 8.09\%$$

** Manually adjusted efficiency From original value of
 7.46e-03. % difference From newly calibrated value
 of 8.12e-03 :

$$\left| \frac{7.46e-03}{8.12e-03} - 1 \right| \times 100 = 8.13\%$$

OK
 MC
 6/9/08

Changes are OK. Per P.A. SGP 713.
 w 6/2/08



Eckert & Ziegler

Analytics

RSO# 849
rec 7-23-07

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

75356-307

100 Grams of Sand in 16 Ounce PP MRP Jar

Customer: Paragon Analytics

P.O. No.: 72905, Item 3

Calibration Date: 01-Jul-2007 12:00 EST **Grams of Master Source:** 0.011387

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty, %			Calibration Method
					u _A	u _B	U	
Am-241	59.5	157860	—	1.374E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.657E+05	1.887E+03	0.9	1.7	3.8	HPGe
Co-57	122.1	271.79	8.714E+04	9.923E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.237E+05	1.409E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	46.61	2.588E+05	2.947E+03	0.5	1.1	2.4	HPGe
Sn-113	391.7	115.1	1.737E+05	1.978E+03	0.6	1.1	2.5	HPGe
Cs-137	661.7	10983	1.109E+05	1.263E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.154E+05	4.730E+03	0.7	1.1	2.6	HPGe
Co-60	1173.2	1925.4	2.050E+05	2.334E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.054E+05	2.339E+03	0.9	1.1	2.8	HPGe
Y-88	1836.1	106.6	4.398E+05	5.008E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

55 mL / 100 grams of customer supplied sand.

This standard will expire one year after the calibration date.

Source Prepared by:

N. E. Kiesman
N. E. Kiesman, Radiochemist

QA Approved:

D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 7-19-07

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Standards File. Gsstd11.std
Assay Date 07/01/2007 10:00
ID.: Geo 11 Std# 849 100g Mixed Gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.322E+02 yrs	0.35900	38.27
2	Cd-109	88.04	4.626E+02 dys	0.03610	522.72
3	Co-57	122.06	2.718E+02 dys	0.85510	11.60
4	Ce-139	165.85	1.376E+02 dys	0.85350	17.54
5	Hg-203	279.00	4.660E+01 dys	0.77300	38.12
6	Sn-113	391.68	1.151E+02 dys	0.64900	30.48
7	Cs-137	661.64	3.017E+01 yrs	0.85120	14.84
8	Y-88	898.02	1.066E+02 dys	0.93400	50.64
9	Co-60	1173.21	5.271E+00 yrs	0.99980	23.34
10	Co-60	1332.48	5.271E+00 yrs	0.99990	23.39
11	Y-88	1836.01	1.066E+02 dys	0.99380	50.39

Geometry 11 Calibration Verification: Gamma Mixed Nuclide Source

Cal source 849 Detector 3

Count Date: 5/30/2008

REF DATE : 7/1/2006

VER STD 826

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY				# of Half Lives		
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g	Activity	Recovery	Pass/Fail	Expired
Am-241	59.5	432.0000	1315	0.3590	100 g	Am-241	3663.0	990.0	1030	104%	Pass	0.00
Cd-109	88	1.2666	1861	0.0361		Cd-109	51551.2	13932.8	14900	107%	Pass	1.51
Co-57	122	0.7441	978.8	0.8560		Co-57	1143.5	309.0	325	105%	Pass	2.57
Ce-139	166	0.3768	1383	0.8035		Ce-139	1721.2	465.2	NA	>5 h-lives	>5 h-lives	5.08
Hg-203	279	0.1276	3069	0.8146		Hg-203	3767.5	1018.2	NA	>5 h-lives	>5 h-lives	15.00
Sn-113	392	0.3151	1958	0.6490		Sn-113	3016.9	815.4	NA	>5 h-lives	>5 h-lives	6.07
Cs-137	662	30.0000	1248	0.8521		Cs-137	1464.6	395.8	427	108%	Pass	0.06
Y-88	898	0.2919	4827	0.9340		Y-88	5168.1	1396.8	NA	>5 h-lives	>5 h-lives	6.56
Co-60	1173	5.2714	2362	0.9997		Co-60	2362.7	638.6	627	98%	Pass	0.36
Co-60	1332	5.2714	2360	0.9998		Co-60	2360.5	638.0	620	97%	Pass	0.36
Y-88	1836	0.2919	5052	0.9938		Y-88	5083.5	1373.9	NA	>5 h-lives	>5 h-lives	6.56

OK
 MC
 6/9/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0813508-3 GEO 11 LCS VER (826)

```

-----
Sampling Start:   07/01/2006 10:00:00 | Counting Start:   05/30/2008 10:11:55
Sampling Stop:   07/01/2006 10:00:00 | Decay Time. . . . . 1.68E+004 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 1853 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080366D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV) = -1.31 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/30/2008

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.49	121.38	24338	378	175	5669	1.05 a	HiResid
2	87.96	178.22	44835	471	169	5261	1.05 a	
3	103.11	208.47	93	98	79	1528	0.57 a	
4	122.06	246.30	16592	308	139	3290	1.12 a	
5	136.46	275.07	2092	170	118	2565	1.06 a	
6	165.83	333.70	4193	194	119	2770	1.16 a	
7	218.38	438.62	111	157	128	3233	1.11 a	NET< CL
8	391.71	784.69	1638	164	117	2533	1.35 a	
9	661.72	1323.77	41914	427	101	1868	1.64 a	HiResid
10	898.13	1795.78	1257	153	111	2293	1.69 a	
11	1173.34	2345.26	37462	399	81	1157	2.21 a	HiResid
12	1332.54	2663.11	33502	371	49	403	2.37 a	HiResid
13	1836.03	3668.35	764	64	26	102	2.73 a	

080366D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File:. DET030523.BKG (080523-3 WEEKLY BACKGROUND)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
10	898.13	1257	153	111	1255	153	111	

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0813508-3 GEO 11 LCS VER (826)

```

-----
Sampling Start: 07/01/2006 10:00:00 | Counting Start: 05/30/2008 10:11:55
Sampling Stop: 07/01/2006 10:00:00 | Decay Time. . . . . 1.68e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00e+002 g | Real Time . . . . . 1853 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 080366D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----

```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh11).EFF (Geo 11 Eff Cal)

Eff.=1/[4.02E-04*En^-4.38E+00 + 7.65E+01*En^7.84E-01] 05/28/2008

Library File:ANALYTICAL.LIB (Analytical)

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MEASURED or MDA CONCENTRATIONS

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=====
Nuclide      N
            ENERGY E   Concentration
            (keV) T   (pCi/g          )      MDA      Critical   Halflife
                                     Level      (hrs)
-----
Am-241      59.54   1.03E+03 +- 1.60E+01  1.49E+01  7.40E+00  3.79E+06
Cd-109      88.02   1.49E+04 +- 1.56E+02  1.13E+02  5.60E+01  1.11E+04
Co-57      122.07   3.25E+02 +- 6.04E+00  5.50E+00  2.72E+00  6.50E+03
Ce-139      165.85   5.22E+02 +- 2.41E+01  2.99E+01  1.48E+01  3.30E+03
Sn-113      391.68   9.36E+02 +- 9.36E+01  1.35E+02  6.69E+01  2.76E+03
Cs-137      661.62   4.27E+02 +- 4.35E+00  2.08E+00  1.02E+00  2.64E+05
Y-88      Average:x 1.34E+03 +- 9.18E+01  . . . . .  . . . . . 2.56E+03
            898.02   1.33E+03 +- 1.63E+02  2.40E+02  1.18E+02  2.56E+03
            1836.01  1.34E+03 +- 1.11E+02  9.52E+01  4.52E+01  2.56E+03
Co-60      Average:x 6.24E+02 +- 4.79E+00  . . . . .  . . . . . 4.62E+04
            1173.21  6.27E+02 +- 6.69E+00  2.75E+00  1.35E+00  4.62E+04
            1332.48  6.20E+02 +- 6.86E+00  1.85E+00  8.99E-01  4.62E+04
Hg-203      279.18      MDA      . . . . .  4.29E+04  2.12E+04  1.12E+03

```

MEASURED TOTAL: 2.01E+04 +- 3.97E+02 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

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=====
PK.  ENERGY  ADDRESS      NET      UN-      C.L.      BKG      FWHM
#    (keV)    CHANNEL    COUNTS  CERTAINTY  COUNTS    COUNTS    (keV)  FLAG
-----
3    103.11   208.47      93       98        79        1528     0.57   Unknown
5    136.46   275.07     2092     170       118       2565     1.06   Unknown
7    218.38   438.62     111      157       128       3233     1.11   Deleted

```


080366D03.SPC Analyzed by

c:\SEEKER\BIN\080366d03.res Analysis Results Saved.

CERTIFICATE OF CALIBRATION Standard Radionuclide Source

73489-307 *RSO #826* *Rec'd 8/09/06*
DUS

100 Grams Sand in 16 Ounce PP MRP Jar

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytix maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1315	3.0
Cd-109	88	462.6 d	1861	3.3
Co-57	122	271.79 d	978.8	3.0
Ce-139	166	137.6 d	1383	2.8
Hg-203	279	46.61 d	3069	2.7
Sn-113	392	115.1 d	1958	2.6
Cs-137	662	30.07 y	1248	3.0
Y-88	898	106.6 d	4827	2.6
Co-60	1173	5.2714 y	2362	2.7
Co-60	1332	5.2714 y	2360	2.6
Y-88	1836	106.6 d	5052	2.6

55 mL/100.05 grams of customer supplied sand.
P O NUMBER 71239, Rel. 7/31/06, Item 3

SOURCE PREPARED BY: *M. Taskaeva*
M. Taskaeva, Radiochemist

Q A APPROVED: *MMJ* 8-24-06

This standard will expire one year after the calibration date.

Standard re verified, Exp 7/26/2008. *W 8/6/2/08*
W 6/2/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0813508-6 GEO 11 EFF CAL (869)

```

-----
Sampling Start:   07/01/2008 10:00:00 | Counting Start:   10/07/2008 09:02:50
Sampling Stop:    07/01/2008 10:00:00 | Decay Time. . . . . 2.35E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 1920 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 081625D06.SPC
-----

```

Detector #: 6 (Detector 6)

Energy(keV) = -0.51 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 10/07/2008

FWHM(keV) = 0.73 + 0.012*En + 6.10E-04*En^2 + 0.00E+00*En^3 07/25/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

```

=====
PEAK SEARCH RESULTS
=====

```

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.56	120.08	13088	368	237	10389	0.91 a	
2	70.71	142.36	1178	348	281	13469	1.21 a	
3	72.87	146.68	1643	278	218	9621	0.86 b	
4	82.72	166.38	394	213	173	7331	0.45 a	
5	88.05	177.03	81504	640	238	11439	0.90 a	HiResid
6	122.12	245.14	64809	586	239	10575	1.00 a	HiResid
7	136.53	273.94	8270	329	226	9418	0.99 a	
8	139.16	279.21	155	310	254	10988	1.16 b	NET< CL
9	165.89	332.64	73886	601	211	8255	1.01 a	HiResid
10	255.18	511.12	2540	237	176	5747	1.04 a	
11	279.25	559.24	47708	492	186	5875	1.13 a	
12	391.78	784.20	53699	504	164	4955	1.25 a	HiResid
13	511.11	1022.74	899	262	210	6217	2.07 a	Wide Pk
14	566.19	1132.85	131	213	174	4698	1.83 a	NET< CL
15	661.69	1323.76	38753	439	159	4406	1.48 a	
16	683.76	1367.89	170	128	103	2411	0.84 a	
17	813.91	1628.05	1112	199	154	3825	2.11 a	
18	898.11	1796.37	56770	505	137	3487	1.67 a	HiResid
19	1173.27	2346.43	41573	428	107	2104	1.91 a	HiResid
20	1325.19	2650.13	1252	162	120	2063	3.07 a	HiResid Wide Pk
21	1332.52	2664.78	37429	400	84	1303	2.04 b	HiResid
22	1835.94	3671.13	33069	370	54	474	2.41 a	HiResid

081625D06.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET061003.BKG (081003-6 WEEKLY BACKGROUND)

Bkg.File Detector #: 6

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	70.71	1178	348	281	1178	349	281	
5	88.05	81504	640	238	81507	640	238	
8	139.16	155	310	254	151	310	254	NET<CL
13	511.11	899	262	210	863	263	210	
18	898.11	56770	505	137	56769	505	137	

 SEEKER C A L I B R A T I O N R E S U L T S Version 2.0.4

Sample ID: 0813508-6 GEO 11 EFF CAL (869)

Stds. Match Tolerance: 2.00 keV

 Detector Number: 06 Calibration Date. . . 10/07/2008 09:02:50

Geometry File (D06)(Sh11).EFF ID. Det.6 Geo.11 Eff Cal

Amount of Std. in Calib. Source: 100.000000 gm

Crossover: 180.00 keV

Below Crossover Efficiency Fit:

$$\text{Eff} = 10^{[-3.37e+01 + 3.01e+01*En + -7.01e+00*En^2 + 0.00e+00*En^3]}$$

(Where En = LOG(Energy in keV)) (Polynomial)

Above Knee Efficiency Fit:

$$\text{Eff} = 10^{[-3.67e+00 + 3.70e+00*En + -1.58e+00*En^2 + 1.81e-01*En^3]}$$
(Where En = LOG(Energy in keV)) (Polynomial)

Pk. #	Energy (keV)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	5.42e-03	1.11	5.49e-03	3.60	5.69e-03
2	88.04	2.80e-02	-4.04	2.69e-02	3.03	2.78e-02
3	122.06	4.74e-02	4.37	4.96e-02	0.42	4.98e-02
4	165.85	4.95e-02	-1.63	4.87e-02	-3.93	4.69e-02
5	279.00	3.70e-02	0.08	3.70e-02	0.09	3.70e-02
6	391.68	2.80e-02	0.10	2.80e-02	2.97	2.89e-02
7	661.64	1.80e-02	-2.10	1.77e-02	3.62	1.83e-02
8	898.02	1.29e-02	3.89	1.34e-02	3.26	1.39e-02
9	1173.21	1.06e-02	-1.05	1.05e-02	3.25	1.09e-02
10	1332.48	9.57e-03	-1.73	9.41e-03	3.51	9.75e-03
11	1836.01	7.09e-03	0.69	7.14e-03	5.35	7.54e-03

Calibration Results Saved.

OK
 NC
 11/06/08

Standards File. Gsstd11.std
Assay Date 07/01/2008 10:00
ID.: Geo 11 Std# 869 100g Mixed Gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.322E+02 yrs	0.35900	37.35
2	Cd-109	88.04	4.626E+02 dys	0.03610	518.84
3	Co-57	122.06	2.718E+02 dys	0.85510	11.40
4	Ce-139	165.85	1.376E+02 dys	0.85350	15.90
5	Hg-203	279.00	4.660E+01 dys	0.77300	39.79
6	Sn-113	391.68	1.151E+02 dys	0.64900	29.61
7	Cs-137	661.64	3.017E+01 yrs	0.85120	14.11
8	Y-88	898.02	1.066E+02 dys	0.93400	49.55
9	Co-60	1173.21	5.271E+00 yrs	0.99980	22.48
10	Co-60	1332.48	5.271E+00 yrs	0.99990	22.50
11	Y-88	1836.01	1.066E+02 dys	0.99380	49.30



Eckert & Ziegler

Analytics

RSB#
869

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

77651-307

100 Grams Sand in 16 Ounce PP MRP Jar

Customer: Paragon Analytics

P.O. No.: 73625, 5/19/08 Rel., Item 3

Calibration Date: 01-Jul-2008 12:00 EST **Grams of Master Source:** 0.01114

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* cps/gram	This Source cps	Uncertainty, %			Calibration Method
					u _A	u _B	U	
Am-241	59.5	157860	—	1.341E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.681E+05	1.873E+03	0.5	1.7	3.5	HPGe
Co-57	122.1	271.79	8.748E+04	9.745E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.218E+05	1.357E+03	0.6	1.1	2.5	HPGe
Hg-203	279.2	46.61	2.761E+05	3.076E+03	0.6	1.1	2.5	HPGe
Sn-113	391.7	115.1	1.725E+05	1.922E+03	0.7	1.1	2.6	HPGe
Cs-137	661.7	10983	1.078E+05	1.201E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.154E+05	4.628E+03	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.017E+05	2.247E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.020E+05	2.250E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	106.6	4.398E+05	4.899E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

55 mL/100 grams customer supplied sand.

This standard will expire one year after the calibration date.

Source Prepared by: N. E. Tibbitts
N. E. Tibbitts, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 7-22-08

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

253 of 412

Geometry 11 Calibration Verification: Gamma Mixed Nuclide Source
 Cal source 869 Detector 6

VER STD 826

REF DATE : 7/1/2006

Count Date: 10/7/2008

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS LIB		EXPECTED ACTIVITY			Recovery	Pass/Fail	# of Half Lives Expired
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard		DPS	pCi/g			
Am-241	59.5	432.0000	1315	0.3590	100 g	Am-241	3663.0	990.0	1060	Pass	0.01
Cd-109	88	1.2666	1861	0.0361		Cd-109	51551.2	13932.8	15900	Pass	1.79
Co-57	122	0.7441	978.8	0.8560		Co-57	1143.5	309.0	309	Pass	3.05
Ce-139	166	0.3768	1383	0.8035		Ce-139	1721.2	465.2	na	>5 h-lives	6.02
Hg-203	279	0.1276	3069	0.8146		Hg-203	3767.5	1018.2	na	>5 h-lives	17.79
Sn-113	392	0.3151	1958	0.6490		Sn-113	3016.9	815.4	na	>5 h-lives	7.20
Cs-137	662	30.0000	1248	0.8521		Cs-137	1464.6	395.8	416	Pass	0.08
Y-88	898	0.2919	4827	0.9340		Y-88	5168.1	1396.8	na	>5 h-lives	7.77
Co-60	1173	5.2714	2362	0.9997		Co-60	2362.7	638.6	658	Pass	0.43
Co-60	1332	5.2714	2360	0.9998		Co-60	2360.5	638.0	655	Pass	0.43
Y-88	1836	0.2919	5052	0.9938		Y-88	5083.5	1373.9	na	>5 h-lives	7.77

OK
 MC
 11/07/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0813508-6 GEO 11 LCS VER (826)

```
-----
Sampling Start: 07/01/2006 10:00:00 | Counting Start: 10/07/2008 09:39:52
Sampling Stop: 07/01/2006 10:00:00 | Decay Time. . . . . 1.99E+004 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 1842 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 081626D06.SPC
-----
```

Detector #: 6 (Detector 6)

Energy(keV) = $-0.51 + 0.500 \cdot \text{Ch} + 0.00\text{E}+00 \cdot \text{Ch}^2 + 0.00\text{E}+00 \cdot \text{Ch}^3$ 10/07/2008FWHM(keV) = $0.73 + 0.012 \cdot \text{En} + 6.10\text{E}-04 \cdot \text{En}^2 + 0.00\text{E}+00 \cdot \text{En}^3$ 07/25/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

=====

PEAK SEARCH RESULTS

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=====
PK.   ENERGY   ADDRESS   NET/MDA   UN-      C.L.      BKG      FWHM
#     (keV)     CHANNEL   COUNTS   CERTAINTY COUNTS    COUNTS   (keV)   FLAG
-----
1     59.55     120.05    13841     279       123       3049     0.88 a
2     88.02     176.98    29749     378       128       3283     0.90 a
3    103.94     208.80     130       143       116       2478     1.04 a
4    122.09     245.08   10477     248       116       2467     0.95 a
5    136.47     273.82    1391     155       112       2321     0.95 a
6    165.83     332.52    1922     159       109       2186     0.90 a
7    310.59     621.89     85       109       89       1587     0.78 a NET< CL
8    391.85     784.34     722     134       101       2027     1.19 a
9    661.64    1323.67   39615     414       93       1496     1.44 a HiResid
10   898.05    1796.26    505     126       97       1824     1.49 a
11  1173.22    2346.32   34260     379       67       862     1.86 a HiResid
12  1332.47    2664.69   30471     352       37       257     1.98 a HiResid
13  1835.96    3671.17    293      43       21       81     2.15 a
=====
```

081626D06.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET061003.BKG (081003-6 WEEKLY BACKGROUND)

Bkg.File Detector #: 6

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	88.02	29749	378	128	29752	378	128	
10	898.05	505	126	97	504	126	97	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0813508-6 GEO 11 LCS VER (826)

```

-----
Sampling Start:      07/01/2006 10:00:00 | Counting Start:      10/07/2008 09:39:52
Sampling Stop:       07/01/2006 10:00:00 | Decay Time. . . . . 1.99e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00e+002 g | Real Time . . . . . 1842 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 081626D06.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----
  
```

Detector #: 6 (Detector 6)

Efficiency File: (D06) (Sh11).EFF (Det.6 Geo.11 Eff Cal)

Eff=10^[-3.37E+01 +3.01E+01*L +-7.01E+00*L² +0.00E+00*L³] 10/07/2008

Eff.=10^[-3.67E+00 +3.70E+00*L +-1.58E+00*L² +1.81E-01*L³] Above 180.00 keV

Library File:ANALYTICAL.LIB (Analytical)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54	1.06E+03 +- 2.13E+01	1.90E+01	9.38E+00	3.79E+06	
Cd-109	88.02	1.59E+04 +- 2.02E+02	1.38E+02	6.81E+01	1.11E+04	
Co-57	122.07	3.09E+02 +- 7.32E+00	6.89E+00	3.41E+00	6.50E+03	
Ce-139	165.85	4.78E+02 +- 3.95E+01	5.48E+01	2.71E+01	3.30E+03	
Sn-113	391.68	8.77E+02 +- 1.63E+02	2.50E+02	1.23E+02	2.76E+03	
Cs-137	661.62	4.16E+02 +- 4.35E+00	1.98E+00	9.75E-01	2.64E+05	
Y-88	Average:x	1.35E+03 +- 1.71E+02	. . . .	. . . .	2.56E+03
	898.02	1.32E+03 +- 3.31E+02	5.16E+02	2.55E+02	2.56E+03	
	1836.01	1.36E+03 +- 1.99E+02	2.11E+02	9.92E+01	2.56E+03	
Co-60	Average:x	6.57E+02 +- 5.25E+00	. . . .	. . . .	4.62E+04
	1173.21	6.58E+02 +- 7.28E+00	2.62E+00	1.28E+00	4.62E+04	
	1332.48	6.55E+02 +- 7.57E+00	1.66E+00	8.02E-01	4.62E+04	
Hg-203	279.18	MDA	. . . .	2.70E+05	1.12E+03

MEASURED TOTAL: 2.10E+04 +- 6.14E+02 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
3	103.94	208.80	130	143	116	2478	1.04	Unknown
5	136.47	273.82	1391	155	112	2321	0.95	Unknown

081626D06.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	310.59	621.89	85	109	89	1587	0.78	Deleted

c:\SEEKER\BIN\081626d06.res Analysis Results Saved.

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

73489-307 *RSO #826* *Rec'd 8/09/06*
QUS

100 Grams Sand in 16 Ounce PP MRP Jar

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1315	3.0
Cd-109	88	462.6 d	1861	3.3
Co-57	122	271.79 d	978.8	3.0
Ce-139	166	137.6 d	1383	2.8
Hg-203	279	46.61 d	3069	2.7
Sn-113	392	115.1 d	1958	2.6
Cs-137	662	30.07 y	1248	3.0
Y-88	898	106.6 d	4827	2.6
Co-60	1173	5.2714 y	2362	2.7
Co-60	1332	5.2714 y	2360	2.6
Y-88	1836	106.6 d	5052	2.6

55 mL/100.05 grams of customer supplied sand.
P O NUMBER 71239, Rel. 7/31/06, Item 3

SOURCE PREPARED BY: *M. Taskaeva*
M. Taskaeva, Radiochemist

Q A APPROVED: *MMJ 8-24-06*

This standard will expire one year after the calibration date.

~~SOURCE RE-VERIFIED 07-25-08~~

~~EXPIRATION DATE = 07-25-09~~

~~MC~~

~~09-10-08~~

Reverified 10-7-08 Expires 10-7-09 *mm* 10-13-08

Corporate Office

Laboratory

1380 Seaboard Industrial Blvd., Atlanta, Georgia 30318

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo.11 / Solid

Sample ID: 0813508-8 GEO 11 EFF CAL (869)

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-----
Sampling Start: 07/01/2008 10:00:00 | Counting Start: 10/07/2008 10:18:34
Sampling Stop: 07/01/2008 10:00:00 | Decay Time. . . . . 2.35E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 2078 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 081925D08.SPC
-----

```

Detector #: 8 (Detector 8)

Energy(keV) = -1.36 + 0.500*Ch + 1.85E-07*Ch^2 + 0.00E+00*Ch^3 10/07/2008

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

```

=====
PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	43.37	89.45	1355	452	367	21320	1.37	a Wide Pk
2	49.49	101.70	3351	497	398	26966	1.22	a
3	59.54	121.78	149650	847	283	17696	0.66	a HiResid
4	65.22	133.15	743	440	359	22015	1.20	a HiResid
								Wide Pk
5	67.08	136.88	7273	785	630	44030	2.21	b HiResid
6	70.72	144.16	7865	471	359	22015	1.12	c HiResid
7	72.71	148.12	9827	612	476	31450	1.70	d HiResid
8	74.90	152.51	375	439	359	22015	1.11	e HiResid
9	82.46	167.62	1716	388	311	19548	0.77	a
10	88.09	178.89	206472	981	303	18507	0.83	a
11	89.96	182.63	232	288	235	11159	0.85	b NET< CL
12	122.07	246.82	95172	671	217	9516	0.87	a HiResid
13	136.46	275.59	11002	324	203	8314	0.80	a HiResid
14	165.87	334.40	85090	637	210	8151	0.93	a HiResid
15	199.15	400.94	2655	283	217	8024	1.07	a
16	203.73	410.10	760	269	217	8024	1.14	b
17	255.12	512.83	2713	229	168	5215	1.01	a
18	279.19	560.96	52164	498	163	4919	1.04	a HiResid
19	301.35	605.26	148	205	167	4758	1.07	a NET< CL
20	353.00	708.50	149	106	84	1757	0.53	a
21	391.69	785.83	57315	516	158	4234	1.16	a HiResid
22	413.60	829.62	124	144	117	2765	0.75	a
23	510.99	1024.26	1101	300	241	7140	2.56	a Wide Pk

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	511.78	1025.83	0	200	165	4463	1.63	b NET< CL
25	544.78	1091.77	145	162	131	3193	1.29	a
26	661.72	1325.44	41023	443	147	4011	1.39	a HiResid
27	665.45	1332.89	92	146	119	3008	0.95	b NET< CL HiResid
28	814.24	1630.13	1014	150	112	2317	1.24	a
29	833.81	1669.23	99	150	122	2751	1.65	a NET< CL
30	898.05	1797.53	60513	521	140	3627	1.61	a HiResid
31	912.37	1826.12	196	198	162	4388	2.02	a
32	1173.30	2347.15	43429	436	106	1982	1.81	a HiResid
33	1194.77	2390.02	92	101	82	1301	1.41	a
34	1325.17	2650.32	1260	150	109	1869	2.60	a HiResid
35	1332.52	2664.99	39241	410	87	1402	1.97	b HiResid
36	1836.07	3669.67	34961	381	58	579	2.35	a HiResid
37	1858.04	3713.49	40	59	48	403	2.14	a NET< CL

081925D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET081003.BKG (081003-8 WEEKLY BACKGROUND)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
4	65.22	743	440	359	735	440	359	
7	72.71	9827	612	476	9824	612	476	
8	74.90	375	439	359	366	439	359	
10	88.09	206472	981	303	206468	981	303	
11	89.96	232	288	235	231	288	235	NET<CL
15	199.15	2655	283	217	2649	283	217	
20	353.00	149	106	84	144	106	85	
23	510.99	1101	300	241	1050	300	241	
30	898.05	60513	521	140	60511	521	140	
31	912.37	197	199	162	194	199	162	

 SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813508-8 GEO 11 EFF CAL (869)

Stds. Match Tolerance: 2.00 keV

 Detector Number: 08 Calibration Date. . . 10/07/2008 10:18:34

Geometry File (D08)(Sh11).EFF ID. Geo 11 Eff Cal

Amount of Std. in Calib. Source: 100.000000 gm

Crossover: 180.00 keV

Below Crossover Efficiency Fit:

$$\text{Eff} = 10^{-7.60e+00 + 6.54e+00 \cdot \text{En} - 1.66e+00 \cdot \text{En}^2 + 0.00e+00 \cdot \text{En}^3}$$

(Where En = LOG(Energy in keV)) (Polynomial)

Above Knee Efficiency Fit:

$$\text{Eff} = 10^{-2.70e+00 + 2.85e+00 \cdot \text{En} - 1.33e+00 \cdot \text{En}^2 + 1.56e-01 \cdot \text{En}^3}$$
(Where En = LOG(Energy in keV)) (Polynomial)

Pk. #	Energy (keV)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	6.20e-02	-0.34	6.18e-02	8.26	6.74e-02
2	88.04	7.09e-02	1.21	7.18e-02	1.37	7.28e-02
3	122.06	6.97e-02	-1.38	6.87e-02	-0.44	6.84e-02
4	165.85	5.71e-02	0.50	5.73e-02	1.35	5.81e-02
5	279.00	4.05e-02	-0.16	4.04e-02	1.04	4.08e-02
6	391.68	2.99e-02	0.64	3.01e-02	-0.09	3.01e-02
7	661.64	1.91e-02	-2.16	1.87e-02	-0.44	1.86e-02
8	898.02	1.37e-02	2.77	1.41e-02	-0.18	1.41e-02
9	1173.21	1.11e-02	-0.26	1.11e-02	0.14	1.11e-02
10	1332.48	1.00e-02	-1.29	9.91e-03	0.28	9.94e-03
11	1836.01	7.50e-03	0.37	7.53e-03	0.50	7.56e-03

Calibration Results Saved.

OK
 MC
 11/06/08

Standards File. Gsstd11.std
Assay Date 07/01/2008 10:00
ID.: Geo 11 Std# 869 100g Mixed Gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
=====					
1	Am-241	59.50	4.322E+02 yrs	0.35900	37.35
2	Cd-109	88.04	4.626E+02 dys	0.03610	518.84
3	Co-57	122.06	2.718E+02 dys	0.85510	11.40
4	Ce-139	165.85	1.376E+02 dys	0.85350	15.90
5	Hg-203	279.00	4.660E+01 dys	0.77300	39.79
6	Sn-113	391.68	1.151E+02 dys	0.64900	29.61
7	Cs-137	661.64	3.017E+01 yrs	0.85120	14.11
8	Y-88	898.02	1.066E+02 dys	0.93400	49.55
9	Co-60	1173.21	5.271E+00 yrs	0.99980	22.48
10	Co-60	1332.48	5.271E+00 yrs	0.99990	22.50
11	Y-88	1836.01	1.066E+02 dys	0.99380	49.30



Eckert & Ziegler

Analytics

RSO#
869

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

77651-307

100 Grams Sand in 16 Ounce PP MRP Jar

Customer: Paragon Analytics

P.O. No.: 73625, 5/19/08 Rel., Item 3

Calibration Date: 01-Jul-2008 12:00 EST **Grams of Master Source:** 0.01114

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty , %			Calibration Method
					Type	u _A	u _B		U
Am-241	59.5	157860	————	1.341E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.681E+05	1.873E+03	0.5	1.7	3.5	HPGe
Co-57	122.1	271.79	8.748E+04	9.745E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.218E+05	1.357E+03	0.6	1.1	2.5	HPGe
Hg-203	279.2	46.61	2.761E+05	3.076E+03	0.6	1.1	2.5	HPGe
Sn-113	391.7	115.1	1.725E+05	1.922E+03	0.7	1.1	2.6	HPGe
Cs-137	661.7	10983	1.078E+05	1.201E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.154E+05	4.628E+03	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.017E+05	2.247E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.020E+05	2.250E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	106.6	4.398E+05	4.899E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

55 mL/100 grams customer supplied sand.

This standard will expire one year after the calibration date.

Source Prepared by:

N. E. Tibbitts
N. E. Tibbitts, Radiochemist

QA Approved:

D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 7-22-08

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

265 of 412

Geometry 11 Calibration Verification: Gamma Mixed Nuclide Source
Cal source 869 Detector 8

VER STD 826

REF DATE : 7/1/2006

Count Date: 10/7/2008

FROM CALIBRATION CERTIFICATE					FROM ANALYTICS LIB			EXPECTED ACTIVITY			Recovery	Pass/Fail	# of Half Lives Expired
Isotope	KeV	Half Life(y)	Gammass/Sec.	Gamma Fraction:	Mass of Standard			DPS	pCi/g	Activity			
Am-241	59.5	432.0000	1315	0.3590	100 g	Am-241	3663.0	3663.0	990.0	1090	110%	Pass	0.01
Cd-109	88	1.2666	1861	0.0361		Cd-109	51551.2	51551.2	13932.8	13600	98%	Pass	1.79
Co-57	122	0.7441	978.8	0.8560		Co-57	1143.5	1143.5	309.0	321	104%	Pass	3.05
Ce-139	166	0.3768	1383	0.8035		Ce-139	1721.2	1721.2	465.2	na	>5 h-lives	>5 h-lives	6.02
Hg-203	279	0.1276	3069	0.8146		Hg-203	3767.5	3767.5	1018.2	na	>5 h-lives	>5 h-lives	17.79
Sn-113	392	0.3151	1958	0.6490		Sn-113	3016.9	3016.9	815.4	na	>5 h-lives	>5 h-lives	7.20
Cs-137	662	30.0000	1248	0.8521		Cs-137	1464.6	1464.6	395.8	401	101%	Pass	0.08
Y-88	898	0.2919	4827	0.9340		Y-88	5168.1	5168.1	1396.8	na	>5 h-lives	>5 h-lives	7.77
Co-60	1173	5.2714	2362	0.9997		Co-60	2362.7	2362.7	638.6	640	100%	Pass	0.43
Co-60	1332	5.2714	2360	0.9998		Co-60	2360.5	2360.5	638.0	651	102%	Pass	0.43
Y-88	1836	0.2919	5052	0.9938		Y-88	5083.5	5083.5	1373.9	na	>5 h-lives	>5 h-lives	7.77

OK
MC
11/06/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0813508-8 GEO 11 LCS VER (826)

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Sampling Start:    07/01/2006 10:00:00 | Counting Start:    10/07/2008 10:57:23
Sampling Stop:    07/01/2006 10:00:00 | Decay Time. . . . . 1.99E+004 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 1888 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 081926D08.SPC
-----

```

Detector #: 8 (Detector 8)

Energy(keV) = -1.36 + 0.500*Ch + 1.85E-07*Ch^2 + 0.00E+00*Ch^3 10/07/2008

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	43.60	89.90	330	218	177	6299	0.80	a
2	49.46	101.63	3846	466	369	21601	1.25	a Wide Pk
3	59.52	121.75	160810	838	200	8892	0.67	a HiResid
4	78.25	159.20	150	196	160	5178	0.77	a NET< CL
5	88.03	178.76	67955	544	128	3637	0.69	a HiResid
6	122.04	246.77	15066	273	98	1921	0.84	a
7	136.43	275.53	1816	139	91	1660	0.87	a
8	165.86	334.39	2321	142	86	1488	0.85	a
9	310.57	623.67	117	161	131	2553	1.42	a NET< CL
10	366.21	734.90	144	179	145	2761	1.83	a NET< CL Wide Pk
11	391.67	785.78	754	136	103	1798	1.17	a
12	405.85	814.13	75	85	69	1043	0.63	a
13	661.70	1325.41	40332	414	83	1260	1.36	a
14	749.62	1501.04	57	78	63	837	0.98	a NET< CL
15	821.90	1645.44	112	92	73	1058	1.12	a
16	898.18	1797.79	550	107	79	1349	1.14	a
17	1140.66	2281.99	76	116	94	1313	2.40	a NET< CL
18	1173.28	2347.12	35092	385	72	911	1.80	a HiResid
19	1332.52	2664.99	31882	360	39	279	1.93	a HiResid
20	1836.12	3669.79	288	41	19	64	1.98	a

081926D08.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File:. DET081003.BKG (081003-8 WEEKLY BACKGROUND)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
4	78.25	150	196	160	145	196	160	NET<CL
5	88.03	67955	544	128	67951	544	128	
12	405.85	75	85	69	74	85	69	
16	898.18	550	107	79	548	107	79	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0813508-8 GEO 11 LCS VER (826)

 Sampling Start: 07/01/2006 10:00:00 | Counting Start: 10/07/2008 10:57:23
 Sampling Stop: 07/01/2006 10:00:00 | Decay Time. 1.99e+004 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 1.00e+002 g | Real Time 1888 Sec
 Collection Efficiency 1.0000 | Spectrum File 081926D08.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh11).EFF (Geo 11 Eff Cal)

Eff=10^{^-7.60E+00 +6.54E+00*L + -1.66E+00*L^2 +0.00E+00*L^3} 10/07/2008

Eff.=10^{^-2.70E+00 +2.85E+00*L + -1.33E+00*L^2 +1.56E-01*L^3} Above 180.00 keV

Library File:ANALYTICAL.LIB (Analytical)

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54	1.09E+03 +- 5.69E+00	2.74E+00	1.36E+00	3.79E+06
Cd-109	88.02	1.36E+04 +- 1.09E+02	5.18E+01	2.56E+01	1.11E+04
Co-57	122.07	3.21E+02 +- 5.80E+00	4.21E+00	2.08E+00	6.50E+03
Ce-139	165.85	4.91E+02 +- 3.01E+01	3.69E+01	1.82E+01	3.30E+03
Sn-113	391.68	8.53E+02 +- 1.54E+02	2.35E+02	1.16E+02	2.76E+03
Cs-137	661.62	4.01E+02 +- 4.11E+00	1.67E+00	8.20E-01	2.64E+05
Y-88	Average:x	1.30E+03 +- 1.49E+02	. . . .	. . . .	2.56E+03
	898.02	1.37E+03 +- 2.66E+02	4.00E+02	1.97E+02	2.56E+03
	1836.01	1.27E+03 +- 1.79E+02	1.76E+02	8.19E+01	2.56E+03
Co-60	Average:x	6.45E+02 +- 5.08E+00	. . . .	. . . .	4.62E+04
	1173.21	6.40E+02 +- 7.02E+00	2.67E+00	1.31E+00	4.62E+04
	1332.48	6.51E+02 +- 7.36E+00	1.64E+00	7.94E-01	4.62E+04
Hg-203	279.18	MDA	2.08E+05	1.03E+05	1.12E+03

MEASURED TOTAL: 1.87E+04 +- 4.63E+02 pCi/g

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UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	43.60	89.90	330	218	177	6299	0.80	Unknown
2	49.46	101.63	3846	466	369	21601	1.25	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	78.25	159.20	145	196	160	5178	0.77	Deleted
7	136.43	275.53	1816	139	91	1660	0.87	Unknown
9	310.57	623.67	117	161	131	2553	1.42	Deleted
10	366.21	734.90	144	179	145	2761	1.83	Deleted
12	405.85	814.13	74	85	69	1043	0.63	Unknown
14	749.62	1501.04	57	78	63	837	0.98	Deleted
15	821.90	1645.44	112	92	73	1058	1.12	1333SEsc
17	1140.66	2281.99	76	116	94	1313	2.40	Deleted

c:\SEEKER\BIN\081926d08.res Analysis Results Saved.

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

73489-307 *RSO #826* *Rec'd 8/29/06*
DUS

100 Grams Sand in 16 Ounce PP MRP Jar

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1315	3.0
Cd-109	88	462.6 d	1861	3.3
Co-57	122	271.79 d	978.8	3.0
Ce-139	166	137.6 d	1383	2.8
Hg-203	279	46.61 d	3069	2.7
Sn-113	392	115.1 d	1958	2.6
Cs-137	662	30.07 y	1248	3.0
Y-88	898	106.6 d	4827	2.6
Co-60	1173	5.2714 y	2362	2.7
Co-60	1332	5.2714 y	2360	2.6
Y-88	1836	106.6 d	5052	2.6

55 mL/100.05 grams of customer supplied sand.
P O NUMBER 71239, Rel. 7/31/06, Item 3

SOURCE PREPARED BY: *M. Taskaeva*
M. Taskaeva, Radiochemist

Q A APPROVED: *M. Taskaeva* 8-24-06

This standard will expire one year after the calibration date.

SOURCE RE-VERIFIED 07-25-08

EXPIRATION DATE = 07-25-09

MC
09-10-08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0813508-9 GEO11 CAL (849)

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Sampling Start:      07/01/2007 10:00:00 | Counting Start:      01/15/2008 18:41:12
Sampling Stop:       07/01/2007 10:00:00 | Decay Time. . . . . 4.76E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 3600 Sec
Sample Size . . . . . 1.00E+002 g | Real Time . . . . . 4014 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080016D09.SPC
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Detector #: 9 (Detector 9)

Energy(keV)= 1.15 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2008

FWHM(keV) = 0.46 + 0.026*En + 4.17E-04*En^2 + 0.00E+00*En^3 01/14/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	49.52	96.81	8985	698	553	48390	1.34	a Wide Pk
2	51.07	99.92	1450	504	410	33864	0.78	b
3	59.46	116.70	294726	1151	315	21949	0.66	a HiResid
4	66.39	130.57	1225	481	392	28352	0.93	a
5	70.70	139.21	2131	512	414	31709	1.00	a
6	72.83	143.46	2675	325	254	15855	0.52	b
7	77.96	153.73	789	367	298	19712	0.68	a
8	87.94	173.71	294672	1138	281	17500	0.67	a HiResid
9	122.11	242.09	131040	776	230	10693	0.82	a HiResid
10	136.52	270.93	15698	358	210	8880	0.84	a
11	165.89	329.71	92883	653	192	7396	0.89	a HiResid
12	199.13	396.24	3030	306	235	9391	1.13	a
13	203.70	405.40	837	260	209	8049	1.00	b
14	255.20	508.48	2386	226	168	5661	0.86	a
15	279.25	556.60	17477	342	178	5853	1.02	a
16	310.42	618.98	232	231	188	6054	1.08	a
17	391.78	781.83	51678	504	179	5490	1.14	a HiResid
18	413.28	824.87	151	191	156	4471	0.94	a NET< CL
19	510.51	1019.46	480	202	162	4847	1.29	a
20	511.99	1022.43	260	181	147	4241	1.07	b
21	661.66	1321.97	65208	548	163	4904	1.37	a HiResid
22	759.43	1517.67	130	153	124	3038	1.06	a
23	768.78	1536.38	99	129	105	2533	0.98	a NET< CL
24	813.84	1626.56	864	168	129	3434	1.37	a

=====

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	821.07	1641.03	127	130	106	2575	0.93	b
26	898.10	1795.20	49006	487	166	5083	1.62	a HiResid
27	1173.25	2345.90	65486	530	114	2509	1.84	a HiResid
28	1194.68	2388.80	186	125	100	1947	1.73	a
29	1324.96	2649.55	1134	176	134	2403	3.36	a HiResid Wide Pk
30	1332.54	2664.71	59200	498	86	1373	1.94	b HiResid
31	1353.89	2707.45	15	170	140	2471	3.76	a NET< CL Wide Pk
32	1835.96	3672.29	27362	337	54	491	2.37	a HiResid
33	1849.24	3698.87	39	42	33	241	1.26	a

080016D09.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET090114.BKG (080114-9 WEEKLY BACKGROUND)

Bkg.File Detector #: 9

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
4	66.39	1225	481	392	1210	482	392	
7	77.96	789	367	298	780	367	298	
8	87.94	294672	1138	281	294666	1138	281	
12	199.13	3030	306	235	3021	306	235	
19	510.51	480	202	162	406	202	163	
26	898.10	49006	487	166	49003	487	166	

 SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813508-9 GEO11 CAL (849)

Stds. Match Tolerance: 2.00 keV

 Detector Number: 09 Calibration Date. . . 01/15/2008 18:41:12

Geometry File (D09) (Sh11).EFF ID. Geo 11 Eff Cal

Amount of Std. in Calib. Source: 100.000000 gm

Crossover: 180.00 keV

Below Crossover Efficiency Fit:

Eff = $10^{-7.00e+00 + 6.03e+00 \cdot \text{En} - 1.56e+00 \cdot \text{En}^2 + 0.00e+00 \cdot \text{En}^3}$

(Where En = LOG(Energy in keV)) (Polynomial)

Above Knee Efficiency Fit:

Eff = $\exp^{[1.49e+00 - 8.33e-01 \cdot \text{En} - 7.65e-03 \cdot \text{En}^2]}$ (Where En = Energy in keV) (Linear/Quad)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	5.96e-02	-0.85	5.91e-02	-0.01	5.91e-02
2	88.04	6.24e-02*	2.98	6.43e-02	-6.92	6.01e-02
3	122.06	6.08e-02	-3.47	5.88e-02	-6.97	5.50e-02
4	165.85	4.68e-02	1.22	4.74e-02	-1.05	4.69e-02
5	279.00	3.15e-02	1.52	3.20e-02	-0.03	3.19e-02
6	391.68	2.40e-02	-2.51	2.34e-02	1.65	2.38e-02
7	661.64	1.45e-02	-1.10	1.44e-02	1.31	1.46e-02
8	898.02	1.04e-02	3.24	1.08e-02	0.38	1.08e-02
9	1173.21	8.37e-03	0.31	8.40e-03	-0.60	8.35e-03
10	1332.48	7.55e-03	-1.38	7.45e-03	-1.09	7.37e-03
11	1836.01	5.51e-03	-0.19	5.50e-03	-2.34	5.37e-03

Calibration Results Saved.

*MANUALLY ADJUSTED EFFICIENCY FROM
 ORIGINAL VALUE OF 5.84×10^{-2} % DIFF.
 FROM NEWLY CALIBRATED VALUE OF
 6.43×10^{-2} :

$$\left| \frac{5.84 \times 10^{-2}}{6.43 \times 10^{-2}} - 1 \right| \times 100 = 9.18\%$$

CHANGE IS O.K. PER P.A. SOP 713

MC

1/17/08

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

75356-307

100 Grams of Sand in 16 Ounce PP MRP Jar

Customer: Paragon Analytics

P.O. No.: 72905, Item 3

Calibration Date: 01-Jul-2007

12:00 EST

Grams of Master Source: 0.011387

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty , %			Calibration Method
					Type			
					u _A	u _B	U	
Am-241	59.5	157860	————	1.374E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.657E+05	1.887E+03	0.9	1.7	3.8	HPGe
Co-57	122.1	271.79	8.714E+04	9.923E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.237E+05	1.409E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	46.61	2.588E+05	2.947E+03	0.5	1.1	2.4	HPGe
Sn-113	391.7	115.1	1.737E+05	1.978E+03	0.6	1.1	2.5	HPGe
Cs-137	661.7	10983	1.109E+05	1.263E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.154E+05	4.730E+03	0.7	1.1	2.6	HPGe
Co-60	1173.2	1925.4	2.050E+05	2.334E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.054E+05	2.339E+03	0.9	1.1	2.8	HPGe
Y-88	1836.1	106.6	4.398E+05	5.008E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

55 mL / 100 grams of customer supplied sand.

This standard will expire one year after the calibration date.

Source Prepared by:

N. E. Kiesman
N. E. Kiesman, Radiochemist

QA Approved:

D. M. Montgomery
D. M. Montgomery, QA Manager

Date:

7-19-07

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Standards File. Gsstd11.std
 Assay Date 07/01/2007 10:00
 ID.: Geo 11 Std# 849 100g Mixed Gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
=====					
1	Am-241	59.50	4.322E+02 yrs	0.35900	38.27
2	Cd-109	88.04	4.626E+02 dys	0.03610	522.72
3	Co-57	122.06	2.718E+02 dys	0.85510	11.60
4	Ce-139	165.85	1.376E+02 dys	0.85350	17.54
5	Hg-203	279.00	4.660E+01 dys	0.77300	38.12
6	Sn-113	391.68	1.151E+02 dys	0.64900	30.48
7	Cs-137	661.64	3.017E+01 yrs	0.85120	14.84
8	Y-88	898.02	1.066E+02 dys	0.93400	50.64
9	Co-60	1173.21	5.271E+00 yrs	0.99980	23.34
10	Co-60	1332.48	5.271E+00 yrs	0.99990	23.39
11	Y-88	1836.01	1.066E+02 dys	0.99380	50.39

Geometry 11 Calibration Verification: Gamma Mixed Nuclide Source

Detector 9 Cal source=849

VER STD 826

REF DATE : 7/1/2006

Count Date: 1/15/2008

FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY				Pass/Fail	# of Half Lives Expired
Isotope	KeV	Half Life(y)	Gammars/Sec.	Gamma Fraction:	Mass of Standard	DPS	pCi/g	Activity	Recovery		
Am-241	59.5	432.0000	1315	0.3590	100 g	3663.0	990.0	1050	106%	Pass	0.00
Cd-109	88	1.2666	1861	0.0361		51551.2	13932.8	13700	98%	Pass	1.22
Co-57	122	0.7441	978.8	0.8560		1143.5	309.0	331	107%	Pass	2.07
Ce-139	166	0.3768	1383	0.8035		1721.2	465.2	493	106%	Pass	4.09
Hg-203	279	0.1276	3069	0.8146		3767.5	1018.2	NR	>5 h-lives	>5 h-lives	12.08
Sn-113	392	0.3151	1958	0.6490		3016.9	815.4	875	107%	Pass	4.89
Cs-137	662	30.0000	1248	0.8521		1464.6	395.8	409	103%	Pass	0.05
Y-88	898	0.2919	4827	0.9340		5168.1	1396.8	1370	98%	Pass	5.28
Co-60	1173	5.2714	2362	0.9997		2362.7	638.6	646	101%	Pass	0.29
Co-60	1332	5.2714	2360	0.9998		2360.5	638.0	654	103%	Pass	0.29
Y-88	1836	0.2919	5052	0.9938		5083.5	1373.9	1410	103%	Pass	5.28

NR = NOT REPORTED

OK
MC
1/17/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo.11 / Solid

Sample ID: 0813508-9 GEO11 CAL✓(826)

VERIF. MC 1/17/08

Sampling Start:	07/01/2006 10:00:00	Counting Start:	01/15/2008 20:41:08
Sampling Stop:	07/01/2006 10:00:00	Decay Time.	1.35E+004 Hrs
Buildup Time.	0.00E+000 Hrs	Live Time	1800 Sec
Sample Size	1.00E+002 g	Real Time	1944 Sec
Collection Efficiency	1.0000	Spc. File	080017D09.SPC

Detector #: 9 (Detector 9)

Energy(keV)= 1.15 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/15/2008

FWHM(keV) = 0.46 + 0.026*En + 4.17E-04*En^2 + 0.00E+00*En^3 01/14/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	49.41	96.60	3555	453	360	20504	1.26	a Wide Pk
2	59.48	116.74	147605	802	188	7837	0.67	a HiResid
3	65.36	128.51	186	111	88	2153	0.35	a Wide Pk
4	67.08	131.96	1470	419	339	14137	1.94	b
5	69.04	135.87	732	317	257	10480	1.24	c
6	77.90	153.61	247	125	99	2727	0.36	a
7	87.96	173.75	91200	628	140	4367	0.68	a HiResid
8	109.79	217.43	125	80	63	1099	0.40	a
9	122.12	242.12	26271	348	105	2202	0.83	a HiResid
10	136.53	270.96	3221	165	99	1967	0.86	a
11	146.05	290.00	88	133	109	2182	0.97	a NET< CL
12	165.90	329.75	7324	204	91	1677	0.83	a HiResid
13	199.27	396.52	249	135	108	2158	0.98	a
14	255.47	509.01	123	126	102	1932	0.92	a
15	260.04	518.15	111	111	89	1610	0.87	b
16	310.14	618.42	136	133	107	1969	1.21	a
17	379.69	757.62	85	138	113	2011	1.32	a NET< CL
18	391.77	781.82	2971	166	103	1821	1.10	a
19	422.29	842.90	60	142	116	2345	1.53	a NET< CL
20	511.08	1020.60	146	143	116	2104	1.79	a
21	661.68	1322.03	32195	375	88	1351	1.39	a HiResid
22	683.65	1366.00	84	90	72	1029	1.10	a
23	898.09	1795.18	2360	157	102	1905	1.58	a
24	1173.29	2345.99	29507	352	64	798	1.85	a HiResid

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	1332.57	2664.77	26488	329	40	295	1.97	a HiResid
26	1836.02	3672.40	1320	76	19	58	2.38	a

080017D09.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET090114.BKG (080114-9 WEEKLY BACKGROUND)

Bkg.File Detector #: 9

=====

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
3	65.36	186	111	88	179	111	88	
6	77.90	247	125	99	243	125	99	
7	87.96	91200	628	140	91197	628	140	
11	146.05	88	133	109	87	133	109	NET<CL
13	199.27	249	135	108	244	135	108	
20	511.08	146	143	116	109	144	117	NET<CL
23	898.09	2360	157	102	2359	157	102	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo.11 / Solid

Sample ID: 0813508-9 GEO11 CAL_v(826)

VERIF.

MC
11/17/08

 Sampling Start: 07/01/2006 10:00:00 | Counting Start: 01/15/2008 20:41:08
 Sampling Stop: 07/01/2006 10:00:00 | Decay Time. 1.35e+004 Hrs
 Buildup Time. 0.00e+000 Hrs | Live Time 1800 Sec
 Sample Size 1.00e+002 g | Real Time 1944 Sec
 Collection Efficiency 1.0000 | Spectrum File 080017D09.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 9 (Detector 9)

Efficiency File: (D09)(Sh11).eff (Geo 11 Eff Cal)

*Eff=10^{-7.00E+00 +6.03E+00*L +-1.56E+00*L² +0.00E+00*L³} 01/15/2008

Eff.= EXP[1.49E+00 + -8.33E-01 * En + -7.65E-03 * En²] Above 180.00 keV

 Library File:ANALYTICAL.LIB (Analytical)
 =====

MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54	1.05E+03 +- 5.68E+00	2.68E+00	1.33E+00	3.79E+06	
Cd-109	88.02	1.37E+04 +- 9.42E+01	4.25E+01	2.11E+01	1.11E+04	
Co-57	122.07	3.31E+02 +- 4.39E+00	2.67E+00	1.32E+00	6.50E+03	
Ce-139	165.85	4.93E+02 +- 1.37E+01	1.25E+01	6.14E+00	3.30E+03	
Sn-113	391.68	8.75E+02 +- 4.90E+01	6.16E+01	3.04E+01	2.76E+03	
Cs-137	661.62	4.09E+02 +- 4.76E+00	2.27E+00	1.12E+00	2.64E+05	
Y-88	Average:x	1.39E+03 +- 6.08E+01	. . . .	. . . .	2.56E+03
	898.02	1.37E+03 +- 9.12E+01	1.20E+02	5.90E+01	2.56E+03	
	1836.01	1.41E+03 +- 8.15E+01	4.30E+01	2.00E+01	2.56E+03	
Co-60	Average:x	6.50E+02 +- 5.60E+00	. . . .	. . . .	4.62E+04
	1173.21	6.46E+02 +- 7.72E+00	2.88E+00	1.41E+00	4.62E+04	
	1332.48	6.54E+02 +- 8.13E+00	2.04E+00	9.87E-01	4.62E+04	
Hg-203	279.18	MDA	5.06E+03	2.50E+03	1.12E+03	

=====

MEASURED TOTAL: 1.89E+04 +- 2.38E+02 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	49.41	96.60	3555	453	360	20504	1.26	Unknown
3	65.36	128.51	179	111	88	2153	0.35	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
4	67.08	131.96	1470	419	339	14137	1.94	Unknown
5	69.04	135.87	732	317	257	10480	1.24	Unknown
6	77.90	153.62	243	125	99	2727	0.36	Unknown
8	109.79	217.43	125	80	63	1099	0.40	Unknown
10	136.53	270.96	3221	165	99	1967	0.86	Unknown
11	146.05	290.00	87	133	109	2182	0.97	Deleted
13	199.27	396.52	244	135	108	2158	0.98	Unknown
14	255.47	509.01	123	126	102	1932	0.92	Unknown
15	260.04	518.15	111	111	89	1610	0.87	Unknown
16	310.14	618.42	136	133	107	1969	1.21	1333DEsc
17	379.69	757.62	85	138	113	2011	1.32	Deleted
19	422.29	842.90	60	142	116	2345	1.53	Deleted
20	511.08	1020.60	109	144	117	2104	1.79	Deleted
22	683.65	1366.00	84	90	72	1029	1.10	Unknown

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

73489-307 *RSO #826* *Rec'd 8/29/06*
DUS

100 Grams Sand in 16 Ounce PP MRP Jar

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytix maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1315	3.0
Cd-109	88	462.6 d	1861	3.3
Co-57	122	271.79 d	978.8	3.0
Ce-139	166	137.6 d	1383	2.8
Hg-203	279	46.61 d	3069	2.7
Sn-113	392	115.1 d	1958	2.6
Cs-137	662	30.07 y	1248	3.0
Y-88	898	106.6 d	4827	2.6
Co-60	1173	5.2714 y	2362	2.7
Co-60	1332	5.2714 y	2360	2.6
Y-88	1836	106.6 d	5052	2.6

55 mL/100.05 grams of customer supplied sand.
P O NUMBER 71239, Rel. 7/31/06, Item 3

SOURCE PREPARED BY: *M. Taskaeva*
M. Taskaeva, Radiochemist

Q A APPROVED: *M. Taskaeva* 8-24-06

This standard will expire one year after the calibration date.

Source Reverified. Expires 7/26/08

for 1/17/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813510-2 GEO 17 EFF CAL (847)

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Sampling Start:      07/01/2007 10:00:00 | Counting Start:      05/21/2008 11:23:49
Sampling Stop:       07/01/2007 10:00:00 | Decay Time. . . . . 7.80E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 3600 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 3699 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080869D02.SPC
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Detector #: 2 (Detector 2)

Energy(keV) = -0.76 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/21/2008

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	57.47	116.34	2258	527	426	20118	2.34	a HiResid Wide Pk
2	59.50	120.39	26676	399	189	7185	0.83	b HiResid
3	87.94	177.22	83841	637	217	9532	0.81	a
4	122.03	245.33	45906	479	177	6311	0.83	a HiResid
5	136.48	274.19	5905	247	159	5067	0.89	a
6	165.81	332.80	30084	407	174	5616	0.93	a
7	255.04	511.07	786	217	173	5081	1.12	a
8	279.11	559.15	1797	198	147	4019	1.05	a
9	310.48	621.83	195	210	171	4645	1.32	a
10	391.70	784.10	17255	321	151	4229	1.24	a
11	511.05	1022.54	512	238	192	5210	2.06	a
12	637.41	1275.00	64	103	83	1716	0.77	a NET< CL
13	661.69	1323.51	50514	478	134	3333	1.61	a
14	813.98	1627.78	272	200	162	4043	2.36	a
15	898.11	1795.85	17637	319	145	3866	1.92	a
16	1173.28	2345.61	51831	473	106	1922	2.24	a HiResid
17	1332.47	2663.67	47273	444	74	889	2.47	a HiResid
18	1835.88	3669.42	10609	213	43	264	3.12	a HiResid

080869D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File:. DET020516.BKG (080516-2 WEEKLY BACKGROUND)

Bkg.File Detector #: 2

=====

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
11	511.05	512	238	192	425	239	193	
15	898.11	17637	319	145	17633	319	145	

 SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813510-2 GEO 17 EFF CAL (847)

Stds. Match Tolerance: 2.00 keV

Detector Number: 02 Calibration Date: . . . 05/21/2008 11:23:49

Geometry File (D02)(Sh17).EFF ID. Geo 17 Eff Cal

Amount of Std. in Calib. Source: 215.000000 gm

Eff = 1 / [1.07e-03*En^-4.23e+00 + 1.25e+02*En^ 7.56e-01]
 (Where En = Energy in MeV) (Exponential)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	5.39e-03	3.10	5.56e-03	-0.00	5.56e-03
2	88.04	2.00e-02	-2.89	1.95e-02	0.00	1.95e-02
3	122.06	2.94e-02	1.96	2.99e-02	-0.00	2.99e-02
4	165.85	2.86e-02	1.76	2.91e-02	-0.00	2.91e-02
5	279.00	2.12e-02	-1.61	2.09e-02	0.00	2.09e-02
6	391.68	1.69e-02 X	-4.27	1.62e-02	0.00	1.62e-02
7	661.64	1.13e-02	-3.49	1.09e-02	0.00	1.09e-02
8	898.02	8.54e-03	1.35	8.66e-03	0.00	8.66e-03
9	1173.21	6.92e-03	2.26	7.08e-03	0.00	7.08e-03
10	1332.48	6.29e-03	2.07	6.43e-03	0.01	6.43e-03
11	1836.01	4.85e-03	3.72	5.04e-03	0.01	5.04e-03

Calibration Results Saved.

OK
 MC
 6/2/08

X MANUALLY ADJUSTED FROM ORIGINAL
 VALUE OF 1.71×10^{-2} , % DIFF FROM
 NEW CALIBRATED VALUE:

$$\left(\frac{1.71 \times 10^{-2} - 1.62 \times 10^{-2}}{1.62 \times 10^{-2} + 1.71 \times 10^{-2}} \right) \times 100 = 5.55\%$$

MC
6/2/08

CHANGE O.K. PER S.O.P. 713.

MC
 6/2/08



Eckert & Ziegler
Analytics

RSO# 847
rec 7-23-2007

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytiscinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

75357B-307

215 Grams of Sand in Metal Can

Customer: Paragon Analytics

P.O. No.: 72905, Item 4

Calibration Date: 01-Jul-2007 12:00 EST **Grams of Master Source:** 0.011421

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty, %			Calibration Method
					u _A	u _B	U	
Am-241	59.5	157860	—	1.378E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.657E+05	1.892E+03	0.9	1.7	3.8	HPGe
Co-57	122.1	271.79	8.714E+04	9.952E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.237E+05	1.413E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	46.61	2.588E+05	2.956E+03	0.5	1.1	2.4	HPGe
Sn-113	391.7	115.1	1.737E+05	1.984E+03	0.6	1.1	2.5	HPGe
Cs-137	661.7	10983	1.109E+05	1.267E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.154E+05	4.744E+03	0.7	1.1	2.6	HPGe
Co-60	1173.2	1925.4	2.050E+05	2.341E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.054E+05	2.346E+03	0.9	1.1	2.8	HPGe
Y-88	1836.1	106.6	4.398E+05	5.023E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

215.14 grams (~140 cc) of customer supplied sand.

This standard will expire one year after the calibration date.

Source Prepared by: N. E. Kiesman
N. E. Kiesman, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 7-19-07

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

288 of 412

Standards File. Gsstd17.std
 Assay Date 07/01/2007 10:00
 ID.: Geo 17 Std 847 215g Mixed Gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.322E+02 yrs	0.35900	17.85
2	Cd-109	88.04	4.626E+02 dys	0.03610	243.77
3	Co-57	122.06	2.718E+02 dys	0.85510	5.41
4	Ce-139	165.85	1.376E+02 dys	0.85350	8.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	17.79
6	Sn-113	391.68	1.151E+02 dys	0.64900	14.22
7	Cs-137	661.64	3.007E+01 yrs	0.85210	6.92
8	Y-88	898.02	1.066E+02 dys	0.93400	23.62
9	Co-60	1173.21	5.271E+00 yrs	0.99970	10.89
10	Co-60	1332.48	5.271E+00 yrs	0.99980	10.91
11	Y-88	1836.01	1.066E+02 dys	0.99380	23.51

Geometry 17 Calibration Verification: Gamma Mixed Nuclide Source
 CAL STD 847 Detector 2

VER STD		827		REF DATE : 7/1/2006		count date 6/2/2008					
FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY					
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard	DPS	pCi/g	Activity	Recovery	Pass/Fail	# of half-lives expired
Am-241	59.9	432.0000	1326	0.3590	215 g	3693.6	464.3	435	94%	Pass	0.00
Cd-109	88	1.2666	1876	0.0361		51966.8	6532.6	7000	107%	Pass	1.52
Co-57	122	0.7441	987.1	0.8551		1154.4	145.1	147	101%	Pass	2.58
Ce-139	166	0.3768	1394	0.8035		1734.9	218.1	NA	>5 h-lives	>5 h-lives	5.10
Hg-203	279	0.1276	3095	0.7730		4003.9	503.3	NA	>5 h-lives	>5 h-lives	15.07
Sn-113	392	0.3151	1975	0.6490		3043.1	382.5	NA	>5 h-lives	>5 h-lives	6.10
Cs-137	662	30.0000	1258	0.8512		1477.9	185.8	193	104%	Pass	0.06
Y-88	898	0.2919	4868	0.9340		5212.0	655.2	NA	>5 h-lives	>5 h-lives	6.58
Co-60	1173	5.2714	2382	1.0000		2382.0	299.4	294	98%	Pass	0.36
Co-60	1332	5.2714	2380	1.0000		2380.0	299.2	291	97%	Pass	0.36
Y-88	1836	0.2919	5095	0.9938		5126.8	644.5	NA	>5 h-lives	>5 h-lives	6.58

OK
 MC
 6/5/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813510-2 GEO 17 LCS VER (827)

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Sampling Start:   07/01/2006 10:00:00 | Counting Start:   06/02/2008 12:36:54
Sampling Stop:   07/01/2006 10:00:00 | Decay Time. . . . . 1.69E+004 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1834 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080898D02.SPC
-----

```

Detector #: 2 (Detector 2)

Energy(keV) = -0.64 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 06/02/2008

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.46	120.06	12431	263	114	2637	0.80 a	
2	76.95	155.00	17	79	64	1152	0.40 a	NET< CL
3	87.92	176.91	24672	348	123	3036	0.82 a	
4	122.02	245.03	8977	222	95	1807	0.89 a	
5	136.47	273.90	1022	125	88	1569	0.80 a	
6	165.81	332.51	2211	140	85	1448	0.88 a	
7	233.22	467.17	68	106	86	1498	0.81 a	NET< CL
8	268.82	538.29	61	68	54	731	0.53 a	
9	391.80	783.96	834	128	94	1621	1.34 a	
10	446.40	893.03	66	84	68	1047	0.89 a	NET< CL
11	511.87	1023.80	148	162	132	2226	2.41 a	Wide Pk
12	567.70	1135.33	92	90	73	974	1.30 a	
13	661.86	1323.42	24635	329	80	1189	1.56 a	
14	898.25	1795.64	684	119	88	1499	1.76 a	
15	1173.62	2345.73	23151	315	67	770	2.22 a	HiResid
16	1332.84	2663.78	20777	292	36	219	2.38 a	HiResid
17	1836.43	3669.76	463	49	19	56	2.99 a	

080898D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET020601.BKG (080601-2 WEEKLY BKGD)

Bkg.File Detector #: 2

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	76.95	17	79	64	12	79	65	NET<CL
11	511.87	148	162	132	99	162	132	NET<CL

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0813510-2 GEO 17 LCS VER (827)

```

-----
Sampling Start:    07/01/2006 10:00:00 | Counting Start:    06/02/2008 12:36:54
Sampling Stop:    07/01/2006 10:00:00 | Decay Time. . . . . 1.69e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15e+002 g | Real Time . . . . . 1834 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 080898D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----
  
```

Detector #: 2 (Detector 2)

Efficiency File: (D02) (Sh17).EFF (Geo 17 Eff Cal)

Eff.=1/[1.07E-03*En^{-4.23E+00} + 1.25E+02*En^{7.56E-01}] 05/21/2008

Library File:ANALYTICAL.LIB (Analytical)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Am-241	59.54	4.35E+02 +- 9.20E+00	8.11E+00	4.01E+00	3.79E+06	
Cd-109	88.02	7.00E+03 +- 9.87E+01	7.04E+01	3.48E+01	1.11E+04	
Co-57	122.07	1.47E+02 +- 3.64E+00	3.15E+00	1.55E+00	6.50E+03	
Ce-139	165.85	2.26E+02 +- 1.43E+01	1.76E+01	8.67E+00	3.30E+03	
Sn-113	391.68	3.80E+02 +- 5.81E+01	8.65E+01	4.26E+01	2.76E+03	
Cs-137	661.62	1.93E+02 +- 2.58E+00	1.28E+00	6.30E-01	2.64E+05	
Y-88	Average:x	6.04E+02 +- 5.47E+01	. . . .	. . . .	2.56E+03
	898.02	5.67E+02 +- 9.89E+01	1.48E+02	7.31E+01	2.56E+03	
	1836.01	6.20E+02 +- 6.56E+01	5.55E+01	2.59E+01	2.56E+03	
Co-60	Average:x	2.93E+02 +- 2.86E+00	. . . .	. . . .	4.62E+04
	1173.21	2.94E+02 +- 4.01E+00	1.74E+00	8.54E-01	4.62E+04	
	1332.48	2.91E+02 +- 4.08E+00	1.06E+00	5.11E-01	4.62E+04	
Hg-203	279.18	MDA	. . . .	2.77E+04	1.12E+03

MEASURED TOTAL: 9.28E+03 +- 2.44E+02 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	76.95	155.00	12	79	65	1152	0.40	Deleted
5	136.47	273.90	1022	125	88	1569	0.80	Unknown
7	233.22	467.17	68	106	86	1498	0.81	Deleted

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
8	268.82	538.29	61	68	54	731	0.53	Unknown
10	446.40	893.03	66	84	68	1047	0.89	Deleted
11	511.87	1023.80	99	162	132	2226	2.41	Deleted
12	567.70	1135.33	92	90	73	974	1.30	Unknown

c:\SEEKER\BIN\080898d02.res Analysis Results Saved.

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 17/26

Sample ID: 0813510-3 GEO 17 EFF CAL (847)

Sampling Start: 07/01/2007 10:00:00 | Counting Start: 06/03/2008 10:18:39
Sampling Stop: 07/01/2007 10:00:00 | Decay Time. 8.11E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 5400 Sec
Sample Size 2.15E+002 g | Real Time 5537 Sec
Collection Efficiency 1.0000 | Spc. File 080385D03.SPC

Detector #: 3 (Detector 3)

Energy(keV) = -1.38 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 06/03/2008

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.47	121.51	32519	496	280	14472	0.98 a	HiResid
2	85.90	174.29	3693	761	618	42299	2.34 a	Wide Pk
3	87.96	178.40	111121	752	286	15152	1.05 b	
4	122.07	246.52	60216	572	242	10797	1.06 a	
5	136.46	275.26	7242	310	213	8368	0.95 a	HiResid
6	165.82	333.90	37280	464	211	8784	1.14 a	
7	255.10	512.19	1036	234	185	6745	1.07 a	
8	279.20	560.31	2066	233	177	6150	1.20 a	
9	391.70	784.97	21106	360	175	5656	1.39 a	
10	511.40	1024.02	480	225	181	5409	1.71 a	
11	661.67	1324.11	67175	552	156	4497	1.68 a	HiResid
12	735.82	1472.18	97	122	99	2256	0.97 a	NET< CL
13	813.84	1627.99	328	205	166	4646	1.94 a	
14	821.81	1643.91	195	178	145	3872	1.68 b	
15	898.06	1796.17	20888	362	180	5435	1.89 a	HiResid
16	1113.63	2226.67	154	157	127	3258	1.63 a	
17	1173.25	2345.72	67971	541	118	2490	2.19 a	HiResid
18	1332.46	2663.67	61633	510	95	1541	2.30 a	HiResid
19	1835.93	3669.09	12422	230	45	310	2.79 a	HiResid

080385D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET030530.BKG (080530-3 WEEKLY BACKGROUND)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
10	511.40	480	225	181	349	226	183	

 SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813510-3 GEO 17 EFF CAL (847)

Stds. Match Tolerance: 2.00 keV

 Detector Number: 03 Calibration Date. . . 06/03/2008 10:18:39

Geometry File (D03)(Sh17).EFF ID. Geo 17 Eff Cal

Amount of Std. in Calib. Source: 215.000000 gm

Crossover: 180.00 keV

Below Crossover Efficiency Fit:

$$\text{Eff} = 10^{-3.12e+01 + 2.79e+01 \cdot \text{En} - 6.55e+00 \cdot \text{En}^2 + 0.00e+00 \cdot \text{En}^3}$$

(Where En = LOG(Energy in keV)) (Polynomial)

Above Knee Efficiency Fit:

$$\text{Eff} = 1 / [1.62e+00 \cdot \text{En}^{-6.17e-01} + 1.43e+02 \cdot \text{En}^{8.67e-01}]$$
(Where En = Energy in MeV) (Exponential)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	4.38e-03	1.12	4.43e-03	1.67	4.50e-03
2	88.04	1.80e-02	-4.08	1.73e-02	-0.21	1.73e-02
3	122.06	2.65e-02	4.40	2.78e-02	-2.11	2.72e-02
4	165.85	2.52e-02	-1.64	2.48e-02	-4.19	2.38e-02
5	279.00	1.97e-02	-0.00	1.97e-02	-1.92	1.93e-02
6	391.68	1.51e-02	0.20	1.51e-02	-1.44	1.49e-02
7	661.64	1.00e-02	-2.02	9.82e-03	-0.74	9.75e-03
8	898.02	7.34e-03	3.34	7.59e-03	-0.20	7.58e-03
9	1173.21	6.07e-03	-0.42	6.05e-03	0.54	6.08e-03
10	1332.48	5.50e-03	-1.30	5.43e-03	1.02	5.48e-03
11	1836.01	4.12e-03	-0.05	4.12e-03	2.76	4.24e-03

Calibration Results Saved.

OK
 MC
 6/5/08



Eckert & Ziegler

Analytics

RSO# 847
rec 7-23-2007

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

75357B-307

215 Grams of Sand in Metal Can

Customer: Paragon Analytics

P.O. No.: 72905, Item 4

Calibration Date: 01-Jul-2007

12:00 EST

Grams of Master Source: 0.011421

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty, %			Calibration Method
					U _A	U _B	U	
Am-241	59.5	157860	—	1.378E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.657E+05	1.892E+03	0.9	1.7	3.8	HPGe
Co-57	122.1	271.79	8.714E+04	9.952E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.237E+05	1.413E+03	0.5	1.1	2.4	HPGe
Hg-203	279.2	46.61	2.588E+05	2.956E+03	0.5	1.1	2.4	HPGe
Sn-113	391.7	115.1	1.737E+05	1.984E+03	0.6	1.1	2.5	HPGe
Cs-137	661.7	10983	1.109E+05	1.267E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.154E+05	4.744E+03	0.7	1.1	2.6	HPGe
Co-60	1173.2	1925.4	2.050E+05	2.341E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.054E+05	2.346E+03	0.9	1.1	2.8	HPGe
Y-88	1836.1	106.6	4.398E+05	5.023E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

215.14 grams (~140 cc) of customer supplied sand.

This standard will expire one year after the calibration date.

Source Prepared by: N. E. Kiesman
N. E. Kiesman, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 7-19-07

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

298 of 412

Standards File. Gsstd17.std
Assay Date 07/01/2007 10:00
ID.: Geo 17 Std 847 215g Mixed Gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.322E+02 yrs	0.35900	17.85
2	Cd-109	88.04	4.626E+02 dys	0.03610	243.77
3	Co-57	122.06	2.718E+02 dys	0.85510	5.41
4	Ce-139	165.85	1.376E+02 dys	0.85350	8.18
5	Hg-203	279.00	4.661E+01 dys	0.77300	17.79
6	Sn-113	391.68	1.151E+02 dys	0.64900	14.22
7	Cs-137	661.64	3.007E+01 yrs	0.85210	6.92
8	Y-88	898.02	1.066E+02 dys	0.93400	23.62
9	Co-60	1173.21	5.271E+00 yrs	0.99970	10.89
10	Co-60	1332.48	5.271E+00 yrs	0.99980	10.91
11	Y-88	1836.01	1.066E+02 dys	0.99380	23.51

Geometry 17 Calibration Verification: Gamma Mixed Nuclide Source

CAL STD 847 Detector 3

VER STD		827		REF DATE :		7/1/2006		count date		6/3/2008		# of half-lives expired
FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB				EXPECTED ACTIVITY				
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard	DPS	pCi/g	Activity	Recovery	Pass/Fail		
Am-241	59.9	432.0000	1326	0.3590	215 g	3693.6	464.3	482	104%	Pass	0.00	
Cd-109	88	1.2666	1876	0.0361		51966.8	6532.6	6970	107%	Pass	1.52	
Co-57	122	0.7441	987.1	0.8551		1154.4	145.1	141	97%	Pass	2.59	
Ce-139	166	0.3768	1394	0.8035		1734.9	218.1	NR	>5 h-lives	>5 h-lives	5.11	
Hg-203	279	0.1276	3095	0.7730		4003.9	503.3	NR	>5 h-lives	>5 h-lives	15.09	
Sn-113	392	0.3151	1975	0.6490		3043.1	382.5	NR	>5 h-lives	>5 h-lives	6.11	
Cs-137	662	30.0000	1258	0.8512		1477.9	185.8	193	104%	Pass	0.06	
Y-88	898	0.2919	4868	0.9340		5212.0	655.2	NR	>5 h-lives	>5 h-lives	6.59	
Co-60	1173	5.2714	2382	1.0000		2382.0	299.4	303	101%	Pass	0.37	
Co-60	1332	5.2714	2380	1.0000		2380.0	299.2	301	101%	Pass	0.37	
Y-88	1836	0.2919	5095	0.9938		5126.8	644.5	NR	>5 h-lives	>5 h-lives	6.59	

OK
MC
6/5/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813510-3 GEO 17 LCS VER (827)

```
-----
Sampling Start:   07/01/2006 10:00:00 | Counting Start:   06/03/2008 14:24:27
Sampling Stop:    07/01/2006 10:00:00 | Decay Time. . . . . 1.69E+004 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1830 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 080386D03.SPC
-----
```

Detector #: 3 (Detector 3)

Energy(keV) = -1.38 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 06/03/2008

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

```
-----
Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS

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=====
PK.   ENERGY  ADDRESS  NET/MDA  UN-   C.L.   BKG   FWHM
#      (keV)   CHANNEL  COUNTS  CERTAINTY  COUNTS  COUNTS  (keV)  FLAG
-----
 1    59.50    121.57    10965     263     131    3170   1.06  a
 2    87.97    178.44    21843     339     137    3460   1.05  a
 3   103.38    209.20     111     161     131    2713   1.34  a NET< CL
 4   122.07    246.52    7960     229     117    2353   1.09  a
 5   136.48    275.30    1072     149     110    2067   1.10  a
 6   165.85    333.96     2022     148     97     1862   1.11  a
 7   341.11    683.95      66      82     66     986   0.80  a
 8   372.89    747.40      49      68     55     750   0.68  a NET< CL
 9   391.74    785.06     749     113     81    1291   1.14  a
10   661.69   1324.15    22120     310     73     987   1.69  a
11   821.85   1643.99     136     144    117    1804   3.01  a Wide Pk
12   898.13   1796.32     690     119     88    1349   1.78  a
13  1173.30   2345.82    20376     294     58     603   2.11  a HiResid
14  1332.46   2663.67    18148     272     31     163   2.33  a HiResid
15  1835.92   3669.09     356      45     19      58   2.72  a
=====
```

080386D03.SPC Analyzed by

SEEKER B A C K G R O U N D S U B T R A C T R E S U L T S Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File:. DET030530.BKG (080530-3 WEEKLY BACKGROUND)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
-----	-----------------	-------------------	----------------------	-----------------	-------------------	----------------------	-----------------	------

SEEKER

F I N A L A C T I V I T Y R E P O R T

Version 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813510-3 GEO 17 LCS VER (827)

```

-----
Sampling Start: 07/01/2006 10:00:00 | Counting Start: 06/03/2008 14:24:27
Sampling Stop: 07/01/2006 10:00:00 | Decay Time. . . . . 1.69e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15e+002 g | Real Time . . . . . 1830 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 080386D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
-----

```

Detector #: 3 (Detector 3)

Efficiency File: (D03) (Sh17).EFF (Geo 17 Eff Cal)

Eff=10^[-3.12E+01 +2.79E+01*L + -6.55E+00*L² +0.00E+00*L³] 06/03/2008Eff.=1/[1.62E+00*En^{-6.17E-01} + 1.43E+02*En^{8.67E-01}] Above 180.00 keV

Library File:ANALYTICAL.LIB (Analytical)

=====

MEASURED or MDA CONCENTRATIONS

```

=====
N
Nuclide      ENERGY E      Concentration      Critical      Halflife
            (keV) T      (pCi/g          )      MDA      Level      (hrs)
-----
Am-241      59.54      4.82E+02 +- 1.16E+01      1.16E+01      5.76E+00      3.79E+06
Cd-109      88.02      6.97E+03 +- 1.08E+02      8.82E+01      4.37E+01      1.11E+04
Co-57      122.07      1.41E+02 +- 4.06E+00      4.22E+00      2.09E+00      6.50E+03
Ce-139      165.85      2.44E+02 +- 1.79E+01      2.38E+01      1.17E+01      3.30E+03
Sn-113      391.68      3.68E+02 +- 5.53E+01      8.08E+01      3.98E+01      2.76E+03
Cs-137      661.62      1.93E+02 +- 2.71E+00      1.30E+00      6.37E-01      2.64E+05
Y-88      Average:x 6.07E+02 +- 6.15E+01      . . . .      . . . .      2.56E+03
            898.02      6.57E+02 +- 1.13E+02      1.69E+02      8.33E+01      2.56E+03
            1836.01      5.87E+02 +- 7.34E+01      6.87E+01      3.21E+01      2.56E+03
Co-60      Average:x 3.02E+02 +- 3.14E+00      . . . .      . . . .      4.62E+04
            1173.21      3.03E+02 +- 4.38E+00      1.78E+00      8.68E-01      4.62E+04
            1332.48      3.01E+02 +- 4.51E+00      1.07E+00      5.13E-01      4.62E+04
Hg-203      279.18      MDA      . . . .      3.00E+04      1.48E+04      1.12E+03

```

MEASURED TOTAL: 9.31E+03 +- 2.64E+02 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

```

=====
PK.  ENERGY  ADDRESS      NET      UN-      C.L.      BKG      FWHM
#    (keV)    CHANNEL    COUNTS  CERTAINTY  COUNTS    COUNTS    (keV)  FLAG
-----
3    103.38    209.20      111      161      131      2713     1.34   Deleted
5    136.48    275.30      1072     149      110      2067     1.10   Unknown

```

080386D03.SPC Analyzed by

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	341.11	683.95	66	82	66	986	0.80	Unknown
8	372.89	747.40	49	69	55	750	0.68	Deleted
11	821.85	1643.99	136	144	117	1804	3.01	1332SEsc

c:\SEEKER\BIN\080386d03.res Analysis Results Saved.

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

73490-307

RSO#407 Rec'd 8/29/06
JS

215 Grams Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytisc maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1326	3.0
Cd-109	88	462.6 d	1876	3.3
Co-57	122	271.79 d	987.1	3.0
Ce-139	166	137.6 d	1394	2.8
Hg-203	279	46.61 d	3095	2.7
Sn-113	392	115.1 d	1975	2.6
Cs-137	662	30.07 y	1258	3.0
Y-88	898	106.6 d	4868	2.6
Co-60	1173	5.2714 y	2382	2.7
Co-60	1332	5.2714 y	2380	2.6
Y-88	1836	106.6 d	5095	2.6

140 mL/215.02 grams of customer supplied sand.
P O NUMBER 71239, Rel. 7/31/06, Item 4

SOURCE PREPARED BY:

M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

M. Taskaeva 8-24-06

This standard will expire one year after the calibration date.

Standard reverified. Expires 7-26-08 Met 6-3-08

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0813510-8 GEO 17 EFF CAL (870)

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Sampling Start:   07/01/2008 10:00:00 | Counting Start:   12/10/2008 14:28:35
Sampling Stop:    07/01/2008 10:00:00 | Decay Time. . . . . 3.89E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1867 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 082187D08.SPC
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Detector #: 8 (Detector 8)

Energy(keV) = -1.51 + 0.500*Ch + 1.99E-07*Ch^2 + 0.00E+00*Ch^3 12/10/2008

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	48.23	99.49	228	156	126	3906	0.44	a
2	49.52	102.08	1118	311	250	10656	1.13	b
3	59.57	122.17	60219	543	191	8055	0.73	a
4	70.97	144.98	11	263	216	9417	0.75	a NET< CL HiResid Wide Pk
5	72.95	148.94	439	266	216	9417	0.83	b HiResid
6	74.58	152.20	-0	448	369	18833	1.69	c NET< CL HiResid
7	88.08	179.21	87327	640	202	8224	0.75	a
8	122.05	247.14	39562	440	155	4856	0.80	a
9	136.44	275.93	4754	219	140	3958	0.78	a HiResid
10	149.90	302.85	140	167	136	3740	0.74	a
11	158.15	319.34	127	120	97	2304	0.43	a
12	165.84	334.73	32511	392	127	3257	0.85	a
13	199.06	401.16	248	150	120	2919	0.88	a
14	255.04	513.09	979	162	123	2774	0.95	a
15	279.16	561.33	10569	248	114	2420	0.98	a
16	391.65	786.24	20678	318	112	2148	1.09	a
17	413.80	830.51	49	89	72	1151	0.65	a NET< CL
18	417.38	837.67	53	73	59	864	0.56	b NET< CL
19	437.02	876.92	89	90	72	1149	0.66	a
20	509.95	1022.71	146	78	61	921	0.61	a Wide Pk
21	511.47	1025.75	470	182	146	2992	2.05	b

=====

PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
22	661.69	1325.97	22698	325	100	1848	1.33	a
23	719.76	1442.00	75	77	62	865	0.82	a
24	814.04	1630.36	497	116	88	1358	1.51	a
25	898.03	1798.15	23014	322	89	1546	1.53	a
26	1173.30	2347.89	24779	326	71	877	1.77	a HiResid
27	1325.37	2651.50	542	97	70	722	3.01	a HiResid
28	1332.56	2665.84	22607	307	51	481	1.91	b HiResid
29	1836.19	3670.77	13862	239	31	168	2.30	a HiResid

082187D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET081205.BKG (081205-8 WEEKLY BKG)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	48.23	228	156	126	213	156	126	
4	70.97	11	263	216	10	263	216	NET<CL
6	74.58	-0	448	369	-8	448	369	NET<CL
7	88.08	87327	640	202	87324	640	202	
13	199.06	248	150	120	241	150	120	
20	509.95	146	78	61	92	79	63	

 SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813510-8 GEO 17 EFF CAL (870)

Stds. Match Tolerance: 2.00 keV

Detector Number: 08 Calibration Date: . . 12/10/2008 14:28:35

Geometry File (D08)(Sh17).EFF ID. Geo 17 Eff Cal

Amount of Std. in Calib. Source: 215.000000 gm

Crossover: 180.00 keV

Below Crossover Efficiency Fit:

$$\text{Eff} = 10^{[-9.46e+00 + 7.81e+00 \cdot \text{En} + -1.91e+00 \cdot \text{En}^2 + 0.00e+00 \cdot \text{En}^3]}$$

(Where En = LOG(Energy in keV)) (Polynomial)

Above Knee Efficiency Fit:

$$\text{Eff} = 10^{[4.36e-01 + -9.02e-01 \cdot \text{En} + 1.54e-02 \cdot \text{En}^2 + -2.81e-04 \cdot \text{En}^3]}$$

(Where En = LOG(Energy in keV)) (Polynomial)

Pk. #	Energy (keV)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	2.45e-02	0.06	2.45e-02	-7.10	2.28e-02
2	88.04	3.24e-02	-0.21	3.23e-02	-4.05	3.10e-02
3	122.06	3.34e-02	0.23	3.35e-02	-5.55	3.17e-02
4	165.85	2.95e-02	-0.08	2.95e-02	-4.59	2.82e-02
5	279.00	2.08e-02	-0.29	2.08e-02	-4.17	2.00e-02
6	391.68	1.55e-02	0.91	1.57e-02	-2.25	1.53e-02
7	661.64	1.04e-02	-2.07	1.02e-02	-1.22	1.01e-02
8	898.02	7.77e-03	2.00	7.92e-03	-1.06	7.84e-03
9	1173.21	6.36e-03	0.13	6.37e-03	-1.07	6.30e-03
10	1332.48	5.79e-03	-0.89	5.74e-03	-1.11	5.68e-03
11	1836.01	4.42e-03	0.16	4.43e-03	-1.31	4.37e-03

Calibration Results Saved.



Eckert & Ziegler

Analytics

RSO# 210

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

77652-307

215 Grams of Sand in Metal Can

Customer: Paragon Analytics
P.O. No.: 73625, 5/19/08 Rel., Item 4
Calibration Date: 01-Jul-2008 12:00 EST **Grams of Master Source:** 0.011374

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* rps/gram	This Source rps	Uncertainty, %			Calibration Method
					Type	u _A	u _B	U
Am-241	59.5	157860	—	1.369E+03	0.3	1.5	3.1	4π LS
Cd-109	88.0	462.60	1.681E+05	1.912E+03	0.5	1.7	3.5	HPGe
Co-57	122.1	271.79	8.748E+04	9.950E+02	0.6	1.3	2.9	HPGe
Ce-139	165.9	137.6	1.218E+05	1.385E+03	0.6	1.1	2.5	HPGe
Hg-203	279.2	46.61	2.761E+05	3.140E+03	0.6	1.1	2.5	HPGe
Sn-113	391.7	115.1	1.725E+05	1.962E+03	0.7	1.1	2.6	HPGe
Cs-137	661.7	10983	1.078E+05	1.226E+03	0.7	1.2	2.8	HPGe
Y-88	898.0	106.6	4.154E+05	4.725E+03	0.8	1.1	2.7	HPGe
Co-60	1173.2	1925.4	2.017E+05	2.294E+03	0.8	1.1	2.7	HPGe
Co-60	1332.5	1925.4	2.020E+05	2.298E+03	0.6	1.1	2.5	HPGe
Y-88	1836.1	106.6	4.398E+05	5.002E+03	0.7	1.1	2.6	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

215 grams (~140 mL) customer supplied sand.
This standard will expire one year after the calibration date.

Source Prepared by: N. E. Tibbitts
N. E. Tibbitts, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 7-22-08

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

310 of 412

Standards File. Gsstd17.std
Assay Date 07/01/2008 10:00
ID.: Geo 17 Std 870 215g Mixed Gamma

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Am-241	59.50	4.322E+02 yrs	0.35900	17.74
2	Cd-109	88.04	4.626E+02 dys	0.03610	246.34
3	Co-57	122.06	2.718E+02 dys	0.85510	5.41
4	Ce-139	165.85	1.376E+02 dys	0.85350	7.55
5	Hg-203	279.00	4.661E+01 dys	0.77300	18.89
6	Sn-113	391.68	1.151E+02 dys	0.64900	14.06
7	Cs-137	661.64	3.007E+01 yrs	0.85210	6.69
8	Y-88	898.02	1.066E+02 dys	0.93400	23.53
9	Co-60	1173.21	5.271E+00 yrs	0.99970	10.67
10	Co-60	1332.48	5.271E+00 yrs	0.99980	10.69
11	Y-88	1836.01	1.066E+02 dys	0.99380	23.41

Geometry 17 Calibration Verification: Gamma Mixed Nuclide Source

CAL STD 870 Detector 8

VER STD 827				REF DATE : 7/1/2006		count date 12/10/2008		# of half-lives expired			
FROM CALIBRATION CERTIFICATE				FROM ANALYTICS.LIB		EXPECTED ACTIVITY					
Isotope	KeV	Half Life(y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard	DPS	pCi/g		Activity	Recovery	Pass/Fail
Am-241	59.9	432.0000	1326	0.3590	215 g	3693.6	464.3	492	106%	Pass	0.01
Cd-109	88	1.2666	1876	0.0361		51966.8	6532.6	6720	103%	Pass	1.93
Co-57	122	0.7441	987.1	0.8551		1154.4	145.1	151	104%	Pass	3.29
Ce-139	166	0.3768	1394	0.8535		1633.3	205.3	NR	>5 h-lives	>5 h-lives	6.49
Hg-203	279	0.1276	3095	0.7730		4003.9	503.3	NR	>5 h-lives	>5 h-lives	19.17
Sn-113	392	0.3151	1975	0.6490		3043.1	382.5	NR	>5 h-lives	>5 h-lives	7.76
Cs-137	662	30.0000	1258	0.8521		1476.4	185.6	192	103%	Pass	0.08
Y-88	898	0.2919	4868	0.9340		5212.0	655.2	NR	>5 h-lives	>5 h-lives	8.37
Co-60	1173	5.2714	2382	1.0000		2382.0	299.4	305	102%	Pass	0.46
Co-60	1332	5.2714	2380	1.0000		2380.0	299.2	309	103%	Pass	0.46
Y-88	1836	0.2919	5095	0.9938		5126.8	644.5	NR	>5 h-lives	>5 h-lives	8.37

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0813510-8 GEO 17 LCS VER (827)

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Sampling Start:   07/01/2006 10:00:00 | Counting Start:   12/10/2008 15:02:59
Sampling Stop:    07/01/2006 10:00:00 | Decay Time. . . . . 2.14E+004 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1831 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 082188D08.SPC
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Detector #: 8 (Detector 8)

Energy(keV) = -1.51 + 0.500*Ch + 1.99E-07*Ch^2 + 0.00E+00*Ch^3 12/10/2008

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	43.37	89.78	142	114	92	1870	0.73	a
2	49.38	101.81	761	208	165	5507	0.86	a
3	59.57	122.18	61644	530	152	5100	0.72	a
4	88.09	179.22	29525	370	112	2534	0.74	a
5	122.06	247.17	6318	190	85	1456	0.83	a
6	136.44	275.93	710	112	81	1319	0.77	a
7	165.82	334.67	849	110	77	1185	0.78	a
8	347.21	697.38	81	123	100	1493	1.49	a NET< CL
9	391.61	786.15	327	116	91	1304	1.34	a
10	661.69	1325.96	22578	310	63	737	1.30	a
11	897.93	1797.96	199	85	66	883	1.32	a
12	959.26	1920.45	75	88	71	1022	1.24	a
13	1173.30	2347.90	20165	291	51	461	1.78	a HiResid
14	1332.57	2665.86	18413	273	27	139	1.94	a
15	1836.40	3671.18	113	25	11	24	1.65	a

082188D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File:. DET081205.BKG (081205-8 WEEKLY BKG)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
4	88.09	29525	370	112	29522	370	112	

 SEEKER FINAL ACTIVITY REPORT Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0813510-8 GEO 17 LCS VER (827)

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Sampling Start: 07/01/2006 10:00:00 | Counting Start: 12/10/2008 15:02:59
Sampling Stop: 07/01/2006 10:00:00 | Decay Time. . . . . 2.14e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15e+002 g | Real Time . . . . . 1831 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 082188D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 8 (Detector 8)

Efficiency File: (D08) (Sh17).EFF (Geo 17 Eff Cal)

Eff=10^{[-9.46E+00 +7.81E+00*L +-1.91E+00*L² +0.00E+00*L³] 12/10/2008}

Eff.=10^{[4.36E-01 +-9.02E-01*L +1.54E-02*L² +-2.81E-04*L³] Above 180.00 keV}

Library File:ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

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              N
      ENERGY E   Concentration
Nuclide  (keV) T (pCi/g)      )      MDA      Critical   Halflife
                                     Level      (hrs)
-----
Am-241    59.54  4.92E+02 +- 4.22E+00  2.44E+00  1.21E+00  3.79E+06
Cd-109    88.02  6.72E+03 +- 8.41E+01  5.17E+01  2.55E+01  1.11E+04
Co-57    122.07  1.51E+02 +- 4.54E+00  4.13E+00  2.03E+00  6.50E+03
Ce-139    165.85  2.25E+02 +- 2.91E+01  4.13E+01  2.03E+01  3.30E+03
Sn-113    391.68  4.85E+02 +- 1.72E+02  2.74E+02  1.35E+02  2.76E+03
Cs-137    661.62  1.92E+02 +- 2.64E+00  1.10E+00  5.38E-01  2.64E+05
Co-60     Average:x 3.07E+02 +- 3.17E+00  . . . . .  . . . . . 4.62E+04
          1173.21  3.05E+02 +- 4.40E+00  1.59E+00  7.74E-01  4.62E+04
          1332.48  3.09E+02 +- 4.59E+00  9.66E-01  4.60E-01  4.62E+04
Hg-203    279.18      MDA      . . . . . 4.02E+05  1.98E+05  1.12E+03
Y-88     898.02      MDA      . . . . . 3.17E+02r 1.54E+02  2.56E+03
  
```

MEASURED TOTAL: 8.57E+03 +- 3.00E+02 pCi/g

UNKNOWN, SUM or ESCAPE PEAKS

```

=====
PK.  ENERGY  ADDRESS  NET    UN-    C.L.    BKG    FWHM
#    (keV)    CHANNEL  COUNTS CERTAINTY COUNTS COUNTS (keV)  FLAG
-----
1    43.37    89.78    142    114     92     1870   0.73  Unknown
2    49.38    101.81   761    208    165     5507   0.86  Unknown
6    136.44   275.93   710    112     81     1319   0.77  Unknown
8    347.21   697.38    81    123    100     1493   1.49  Deleted
  
```

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
11	897.93	1797.96	199	85	66	883	1.32	Unknown
12	959.26	1920.45	75	88	71	1022	1.24	Unknown
15	1836.40	3671.18	113	25	11	24	1.65	Unknown

c:\SEEKER\BIN\082188d08.res Analysis Results Saved.

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

73490-307

RSO#827 Rec'd 8/29/06
JS

215 Grams Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1326	3.0
Cd-109	88	462.6 d	1876	3.3
Co-57	122	271.79 d	987.1	3.0
Ce-139	166	137.6 d	1394	2.8
Hg-203	279	46.61 d	3095	2.7
Sn-113	392	115.1 d	1975	2.6
Cs-137	662	30.07 y	1258	3.0
Y-88	898	106.6 d	4868	2.6
Co-60	1173	5.2714 y	2382	2.7
Co-60	1332	5.2714 y	2380	2.6
Y-88	1836	106.6 d	5095	2.6

140 mL/215.02 grams of customer supplied sand.
P O NUMBER 71239, Rel. 7/31/06, Item 4

SOURCE PREPARED BY:

M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

M. Taskaeva 8-24-06

This standard will expire one year after the calibration date.

SOURCE RE-VERIFIED 07-28-08.

NEW EXPIRATION DATE = 07-28-09.

MC
09-10-08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813512-2 GEO 26 EFF CAL (435)

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Sampling Start:   10/04/1996 10:00:00 | Counting Start:   05/16/2008 11:59:22
Sampling Stop:   10/04/1996 10:00:00 | Decay Time. . . . . 1.02E+005 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 2700 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 2787 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080842D02.SPC
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Detector #: 2 (Detector 2)

Energy(keV) = -0.73 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/16/2008

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.56	94.47	402	258	209	8099	1.00	a
2	53.09	107.51	453	128	99	2730	0.39	a
3	72.92	147.12	607	281	228	9600	0.92	a HiResid
4	74.56	150.39	11167	321	199	8000	0.88	b HiResid
5	76.94	155.14	21586	404	228	9600	0.91	c HiResid
6	79.23	159.71	73	207	170	6400	0.62	d NET< CL HiResid
7	81.73	164.70	0	131	107	3200	0.41	e NET< CL HiResid
8	83.68	168.60	272	244	199	8000	0.76	f HiResid
9	87.01	175.25	9567	339	228	9600	1.05	g HiResid
10	89.71	180.64	2961	266	199	8000	0.87	h HiResid
11	186.08	373.14	14756	359	218	8777	0.97	a
12	195.76	392.48	264	227	185	6862	0.83	a
13	241.88	484.60	22309	368	177	5776	1.04	a
14	258.85	518.48	1156	214	167	5151	0.92	a
15	274.48	549.69	864	205	162	4828	0.92	a HiResid
16	281.22	563.17	248	269	219	7113	1.42	a
17	295.12	590.92	48438	489	175	5251	1.07	a
18	314.12	628.87	247	175	141	3695	0.91	a
19	348.71	697.97	619	326	265	7772	2.32	a Wide Pk
20	351.76	704.06	82225	602	151	3886	1.20	b
21	386.86	774.17	522	180	143	3800	1.29	a
22	388.87	778.19	694	182	143	3800	1.23	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
23	405.76	811.91	200	130	104	2469	0.81	a
24	454.67	909.60	408	154	122	2750	1.28	a
25	461.65	923.56	371	164	131	2975	1.43	a
26	480.35	960.89	562	144	112	2327	1.27	a
27	486.94	974.06	725	159	123	2618	1.53	b
28	509.62	1019.36	231	147	118	2417	1.43	a
29	511.00	1022.11	383	184	148	3222	1.95	b
30	533.76	1067.57	237	120	96	1803	1.15	a
31	543.32	1086.68	100	103	83	1466	1.01	a
32	572.84	1145.64	71	103	83	1463	1.01	a NET< CL
33	580.01	1159.95	410	119	92	1676	1.17	a
34	609.20	1218.27	61929	513	103	1842	1.54	a
35	649.90	1299.56	63	88	71	1097	1.23	a NET< CL
36	665.40	1330.52	1794	141	92	1574	1.59	a
37	683.79	1367.25	66	190	156	2980	3.32	a NET< CL Wide Pk
38	702.85	1405.31	519	121	92	1580	1.59	a
39	719.75	1439.07	429	115	88	1446	1.61	a
40	741.90	1483.31	289	149	120	2117	2.51	a
41	752.84	1505.16	185	94	74	1117	1.29	a
42	768.38	1536.19	5578	188	94	1554	1.78	a
43	785.88	1571.16	1264	127	86	1371	1.68	a
44	806.23	1611.81	1204	128	88	1445	1.57	a
45	821.20	1641.70	128	78	62	879	1.02	a
46	826.09	1651.47	83	134	109	1905	2.19	b NET< CL
47	838.94	1677.14	689	122	90	1504	1.66	a
48	934.05	1867.11	2986	154	89	1478	2.04	a
49	963.90	1926.72	328	112	87	1407	1.98	a
50	997.64	1994.11	72	65	52	664	0.99	a
51	1052.14	2102.97	325	91	68	940	1.69	a
52	1070.04	2138.74	295	118	93	1423	2.52	a
53	1104.43	2207.42	89	102	83	1211	2.16	a
54	1120.20	2238.91	13003	249	82	1206	2.17	a HiResid
55	1133.40	2265.29	175	90	71	974	1.74	a
56	1155.20	2308.83	1440	124	81	1159	2.07	a
57	1180.69	2359.73	140	206	168	2726	5.52	a NET< CL Wide Pk
58	1183.64	2365.63	-7	59	49	561	1.11	b NET< CL
59	1207.42	2413.13	273	100	77	1021	2.36	a
60	1238.01	2474.22	4638	163	73	957	2.20	a HiResid
61	1253.22	2504.60	304	138	110	1531	3.77	a Wide Pk
62	1280.96	2560.02	1106	115	77	1019	2.24	a
63	1377.54	2752.92	3305	149	78	991	2.51	a
64	1385.30	2768.43	582	102	74	925	2.30	b
65	1401.57	2800.91	933	113	78	995	2.48	a
66	1407.96	2813.69	1726	126	78	995	2.53	b
67	1509.09	3015.67	1491	127	83	1101	2.61	a
68	1538.64	3074.70	369	111	86	1089	2.90	a
69	1543.49	3084.38	381	98	74	908	2.38	b

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
70	1583.26	3163.82	470	100	74	833	2.84	a
71	1595.24	3187.74	132	76	60	637	2.13	b
72	1599.61	3196.48	127	64	49	490	1.61	c
73	1661.12	3319.33	642	83	54	463	2.58	a
74	1683.89	3364.81	129	72	56	453	3.17	a
75	1692.89	3382.78	198	87	68	572	3.91	b
76	1729.48	3455.87	2183	112	51	378	2.94	a
77	1764.33	3525.49	10141	210	50	365	2.98	a HiResid
78	1838.20	3673.03	181	56	40	263	2.53	a
79	1847.22	3691.05	1427	96	48	333	3.04	b
80	1873.09	3742.71	103	48	36	226	2.11	a
81	1896.17	3788.81	75	53	41	286	2.34	a

080842D02.SPC Analyzed by

SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813512-2 GEO 26 EFF CAL (435)

Stds. Match Tolerance: 2.00 keV

Detector Number: 02 Calibration Date. . . 05/16/2008 11:59:22

Geometry File (D02)(Sh26).eff ID. Geo 26 Eff Cal

Amount of Std. in Calib. Source: 215.000000 gm

Eff = Spline Fit

Pk. #	Energy (keV)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	295.22	1.65e-02	0.00	1.65e-02	0.00	0.00e+00
2	351.99	1.45e-02	0.00	1.45e-02	0.00	0.00e+00
3	609.32	8.76e-03	0.00	8.76e-03	0.00	0.00e+00
4	1120.28	5.65e-03	0.00	5.65e-03	0.00	0.00e+00

Calibration Results Saved.

OK
MC
6/2/08

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 - U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

Source # 435
rec'd 10-10-96

53012-307

Ra-226 Sand in 3 Inch Can Filled to Capacity

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a master radionuclide solution standard. The master radionuclide solution standard was calibrated by the National Institute of Standards and Technology as SRM 4967. Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-226
ACTIVITY (dps):	5702
CALIBRATION DATE:	October 4, 1996 12:00 EST
HALF-LIFE:	1600 years
PERCENT ERROR:	5.0

215.1 grams of sand.

P O NUMBER

SOURCE PREPARED BY:

M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED:

DM. Mty 10-4-96

Calibration Source Reverified. Expires 7/3/07.
RG 7/19/06

Calibration Source Reverified. Expires 6/13/08
Jro 5/17/08

Standards File. Gsstd26.std
Assay Date 10/04/2000 10:00
ID.: Geo. 26 (std# 435) 215g can (Ra-226)

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
=====					
1	Ra-226	295.22	1.600E+03 yrs	0.19200	26.50
2	Ra-226	351.99	1.600E+03 yrs	0.37100	26.50
3	Ra-226	609.32	1.600E+03 yrs	0.46100	26.50
4	Ra-226	1120.28	1.600E+03 yrs	0.15000	26.50

Geo 26		Halflife (yr)	Orig Act	Decay Act.	Rprt Act.	% Rec.
Std # :	144	1600	472.9	472.9	446	94.3%
Std Date:	12/11/1995					
Decay Date:	12/11/1995					

OK
mc
6/2/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813512-2 GEO 26 LCS VER (144)

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Sampling Start:   12/11/1995 10:00:00 | Counting Start:   05/16/2008 13:10:49
Sampling Stop:    12/11/1995 10:00:00 | Decay Time. . . . . 1.09E+005 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1836 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080843D02.SPC
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Detector #: 2 (Detector 2)

Energy(keV) = -0.73 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/16/2008

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

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Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000
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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.71	150.69	4565	227	150	4153	0.91	a HiResid
2	76.95	155.16	8369	243	131	3461	0.82	b HiResid
3	79.18	159.61	296	117	92	2077	0.52	c HiResid
4	80.88	163.01	1	86	71	1384	0.41	d NET< CL HiResid
5	83.55	168.35	177	115	92	2077	0.52	e HiResid
6	87.03	175.29	3537	218	150	4153	0.96	f HiResid
7	89.75	180.74	1161	173	131	3461	0.81	g HiResid
8	94.42	190.06	142	144	117	2768	0.81	a
9	186.08	373.14	6834	236	139	3566	0.94	a
10	241.87	484.58	9158	238	116	2472	1.04	a
11	258.81	518.40	558	138	106	2088	0.99	a
12	274.36	549.46	361	147	116	2315	1.11	a
13	280.55	561.82	85	111	90	1640	0.83	a NET< CL
14	295.11	590.90	20201	314	110	2079	1.06	a
15	333.55	667.69	151	203	165	3194	2.05	a NET< CL Wide Pk
16	351.76	704.06	34168	390	103	1797	1.16	a
17	386.94	774.33	259	117	92	1574	1.37	a
18	388.89	778.22	294	107	84	1377	1.15	b
19	405.71	811.81	142	114	92	1566	1.35	a
20	454.89	910.05	159	99	79	1140	1.33	a
21	461.86	923.96	141	95	76	1062	1.37	a
22	469.96	940.14	107	117	95	1398	1.83	a

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
23	480.28	960.76	354	100	76	1015	1.45	a
24	486.93	974.05	299	92	70	902	1.29	b
25	511.20	1022.52	305	153	122	1772	2.77	a Wide Pk
26	533.76	1067.57	94	70	55	647	1.02	a
27	543.53	1087.09	61	60	48	518	0.86	a
28	579.97	1159.88	181	90	71	871	1.47	a
29	609.20	1218.26	25482	329	64	721	1.53	a
30	665.47	1330.65	761	88	56	586	1.62	a
31	702.82	1405.26	199	83	64	726	1.84	a
32	719.75	1439.08	190	80	62	669	1.73	a
33	742.25	1484.01	79	62	49	490	1.34	a
34	752.66	1504.80	71	76	61	649	1.85	a
35	768.38	1536.21	2297	122	62	647	1.92	a
36	785.96	1571.32	461	85	60	636	1.77	a
37	806.17	1611.67	533	81	55	549	1.71	a
38	838.83	1676.92	281	76	56	580	1.59	a
39	934.08	1867.17	1212	100	59	638	1.92	a
40	963.96	1926.85	118	80	64	693	2.32	a
41	1051.69	2102.08	94	56	43	391	1.50	a
42	1069.99	2138.62	69	62	49	464	1.79	a
43	1120.17	2238.85	5405	161	54	510	2.09	a HiResid
44	1133.69	2265.86	66	58	46	401	1.84	a
45	1155.23	2308.88	573	81	54	519	2.14	a
46	1207.81	2413.92	145	72	56	495	2.63	a
47	1238.02	2474.24	1918	107	50	432	2.30	a
48	1253.13	2504.43	46	47	37	287	1.42	a
49	1280.98	2560.05	493	77	52	445	2.46	a
50	1377.51	2752.86	1371	95	49	400	2.48	a
51	1385.15	2768.12	257	74	54	453	2.71	b
52	1401.34	2800.46	339	69	48	399	2.35	a
53	1407.96	2813.68	750	83	51	428	2.49	b
54	1509.18	3015.85	612	81	53	459	2.53	a
55	1583.06	3163.42	165	65	49	370	2.80	a
56	1661.27	3319.64	281	55	36	198	2.73	a
57	1693.35	3383.71	47	31	23	115	1.41	a
58	1729.41	3455.74	954	73	32	156	2.99	a
59	1764.38	3525.58	4411	138	31	139	3.06	a
60	1838.47	3673.56	63	38	28	120	3.00	a
61	1847.21	3691.02	597	60	28	120	2.94	b
62	1872.83	3742.19	61	55	43	189	5.28	a Wide Pk

080843D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET020509.BKG (080509-2 WEEKLY BKG)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.71	4565	227	150	4562	227	150	
2	76.95	8369	243	131	8365	243	131	
6	87.03	3537	218	150	3536	218	150	
8	94.42	142	144	117	126	145	117	
9	186.08	6834	236	139	6827	236	139	
11	258.81	558	138	106	556	138	106	
14	295.11	20201	314	110	20198	314	110	
16	351.76	34168	390	103	34165	390	103	
25	511.20	305	153	122	260	153	123	
29	609.20	25482	329	64	25479	329	65	
40	963.96	118	80	64	117	81	64	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0813512-2 GEO 26 LCS VER (144)

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Sampling Start: 12/11/1995 10:00:00 | Counting Start: 05/16/2008 13:10:49
Sampling Stop: 12/11/1995 10:00:00 | Decay Time. . . . . 1.09e+005 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15e+002 g | Real Time . . . . . 1836 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 080843D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 2 (Detector 2)

Efficiency File: (D02)(Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 05/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	N T	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:x	4.46E+02 +- 3.24E+00				1.40E+07
	295.21	4.49E+02 +- 6.99E+00	4.97E+00	2.46E+00	1.40E+07	
	351.92	4.47E+02 +- 5.11E+00	2.72E+00	1.34E+00	1.40E+07	
	609.31	4.43E+02 +- 5.72E+00	2.29E+00	1.12E+00	1.40E+07	
	1120.29	4.45E+02 +- 1.32E+01	9.04E+00	4.41E+00	1.40E+07	

MEASURED TOTAL: 4.46E+02 +- 3.24E+00 pCi/g

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UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.71	150.69	4562	227	150	4153	0.91	Unknown
2	76.95	155.16	8365	243	131	3461	0.82	Unknown
3	79.18	159.61	296	117	92	2077	0.52	Unknown
4	80.88	163.01	1	86	71	1384	0.41	Deleted
5	83.55	168.35	177	115	92	2077	0.52	Unknown
6	87.03	175.29	3536	218	150	4153	0.96	Unknown
7	89.75	180.74	1161	173	131	3461	0.81	Unknown
8	94.42	190.06	126	145	117	2768	0.81	Unknown
9	186.08	373.14	6827	236	139	3566	0.94	1208DEsc
10	241.87	484.58	9158	238	116	2472	1.04	Unknown
11	258.81	518.40	556	138	106	2088	0.99	1281DEsc

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	274.36	549.46	361	147	116	2315	1.11	Unknown
13	280.55	561.82	85	111	90	1640	0.83	Deleted
15	333.55	667.69	151	203	165	3194	2.05	Deleted
17	386.94	774.33	259	117	92	1574	1.37	1408DEsc
18	388.89	778.22	294	107	84	1377	1.15	Unknown
19	405.71	811.81	142	114	92	1566	1.35	Unknown
20	454.89	910.05	159	99	79	1140	1.33	Unknown
21	461.86	923.96	141	95	76	1062	1.37	Unknown
22	469.96	940.14	107	117	95	1398	1.83	Unknown
23	480.28	960.76	354	100	76	1015	1.45	Unknown
24	486.93	974.05	299	92	70	902	1.29	1509DEsc
25	511.20	1022.52	260	153	123	1772	2.77	Unknown
26	533.76	1067.57	94	70	55	647	1.02	Unknown
27	543.53	1087.09	61	60	48	518	0.86	Unknown
28	579.97	1159.88	181	90	71	871	1.47	Unknown
30	665.47	1330.65	761	88	56	586	1.62	Unknown
31	702.82	1405.26	199	83	64	726	1.84	Unknown
32	719.75	1439.08	190	80	62	669	1.73	Unknown
33	742.25	1484.01	79	62	49	490	1.34	1764DEsc
34	752.66	1504.80	71	76	61	649	1.85	Unknown
35	768.38	1536.21	2297	122	62	647	1.92	1281SEsc
36	785.96	1571.32	461	85	60	636	1.77	Unknown
37	806.17	1611.67	533	81	55	549	1.71	Unknown
38	838.83	1676.92	281	76	56	580	1.59	Unknown
39	934.08	1867.17	1212	100	59	638	1.92	Unknown
40	963.96	1926.85	117	81	64	693	2.32	Unknown
41	1051.69	2102.08	94	56	43	391	1.50	Unknown
42	1069.98	2138.62	69	62	49	464	1.79	Unknown
44	1133.69	2265.86	66	58	46	401	1.84	Unknown
45	1155.23	2308.88	573	81	54	519	2.14	Unknown
46	1207.81	2413.92	145	72	56	495	2.63	Unknown
47	1238.02	2474.24	1918	107	50	432	2.30	Unknown
48	1253.13	2504.43	46	47	37	287	1.42	1764SEsc
49	1280.98	2560.05	493	77	52	445	2.46	Unknown
50	1377.51	2752.86	1371	95	49	400	2.48	Unknown
51	1385.15	2768.12	257	74	54	453	2.71	Unknown
52	1401.34	2800.46	339	69	48	399	2.35	Unknown
53	1407.96	2813.68	750	83	51	428	2.49	Unknown
54	1509.18	3015.85	612	81	53	459	2.53	Unknown
55	1583.06	3163.42	165	65	49	370	2.80	Unknown
56	1661.27	3319.64	281	55	36	198	2.73	Unknown
57	1693.35	3383.71	47	31	23	115	1.41	Unknown
58	1729.41	3455.74	954	73	32	156	2.99	Unknown
59	1764.38	3525.58	4411	138	31	139	3.06	Unknown
60	1838.47	3673.56	63	38	28	120	3.00	Unknown
61	1847.21	3691.02	597	60	28	120	2.94	Unknown
62	1872.83	3742.19	61	55	43	189	5.28	Unknown



Analytics, Inc.
1380 Seaboard Industrial Boulevard
Atlanta, Georgia 30318
404.352-8677

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

ATTD 0144
REC'D 12-12-95

51290-307

Ra-226 Sand in Steel Can

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a calibrated master radionuclide solution source which was calibrated using a germanium gamma spectrometer system. This calibration has been confirmed by the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system and alpha spectroscopy system. The nuclear decay rate and assay date for this source are given below.

ISOTOPE: Ra-226
ACTIVITY (dps): 3762
HALF-LIFE: 1600 years
CALIBRATION DATE: December 11, 1995 12:00 EST
TOTAL ERROR: 4.9%
SYSTEMATIC ERROR: 3.5%
RANDOM ERROR: 1.4%

215 grams of sand. 2 1/8" OD X 2 7/8" H.

P O NUMBER 51393, Item 1

SOURCE PREPARED BY:

M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED:

M. D. Currie 12-11-95

~~CALIBRATION SOURCE REVERIFIED~~

~~NEW EXPIRATION DATE → 6/25/05~~ MC 12/6/05

~~CALIBRATION SOURCE REVERIFIED~~

~~NEW EXPIRATION DATE → 6/23/06~~ MC 12/6/05

~~CALIBRATION SOURCE REVERIFIED~~

~~NEW EXPIRATION DATE → 7/3/07~~ MC 7/24/07

Source reverified

New expiration date → 6/13/08
7/24/07

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813512-3 GEO 26 EFF CAL (435)

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Sampling Start:   10/04/1996 10:00:00 | Counting Start:   07/16/2008 09:28:19
Sampling Stop:    10/04/1996 10:00:00 | Decay Time. . . . . 1.03E+005 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1854 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080642D03.SPC
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Detector #: 3 (Detector 3)

Energy(keV) = -1.27 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 07/16/2008

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.76	151.87	7008	332	236	8836	1.25	a
2	77.01	156.37	11547	315	189	6627	1.02	b
3	79.26	160.86	652	179	141	4418	0.74	c
4	83.89	170.10	410	187	150	4533	0.84	a
5	87.10	176.52	5115	297	214	7252	1.29	b
6	89.75	181.82	1826	250	193	6346	1.11	c
7	186.13	374.32	8665	283	175	6051	1.18	a
8	241.93	485.77	13185	300	159	4653	1.25	a
9	258.81	519.49	840	173	134	3554	1.19	a
10	274.55	550.91	512	198	159	4384	1.39	a
11	295.15	592.07	28411	376	137	3480	1.29	a
12	349.71	701.04	674	219	175	4303	2.12	a Wide Pk
13	351.81	705.23	47776	461	120	2648	1.33	b
14	387.00	775.52	348	153	122	2602	1.47	a
15	388.86	779.23	345	129	101	2024	1.19	b
16	405.68	812.84	176	100	79	1436	0.89	a
17	454.81	910.97	218	97	76	1228	0.99	a
18	461.43	924.18	188	138	112	2046	1.69	b
19	469.95	941.20	60	81	65	966	0.83	a NET< CL
20	480.36	961.99	215	110	87	1405	1.28	a
21	487.00	975.26	296	102	79	1229	1.17	b
22	510.12	1021.44	296	139	111	1827	1.94	a
23	511.93	1025.04	148	128	104	1675	1.77	b
24	533.60	1068.34	158	101	80	1189	1.24	a

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	579.93	1160.88	324	111	86	1374	1.59	a
26	609.22	1219.37	36568	395	82	1230	1.63	a HiResid Wide Pk
27	615.19	1231.30	350	156	125	1740	3.70	b HiResid
28	665.39	1331.57	1001	101	65	825	1.54	a
29	703.14	1406.96	295	88	66	859	1.47	a
30	719.68	1440.01	165	75	58	692	1.36	a
31	742.14	1484.86	146	126	102	1420	2.78	a Wide Pk
32	768.36	1537.25	3220	143	72	908	1.84	a
33	785.92	1572.31	725	101	71	878	1.80	a
34	806.08	1612.59	760	107	75	949	2.03	a
35	821.01	1642.40	24	65	53	613	1.15	a NET< CL
36	838.89	1678.12	403	104	78	1034	2.04	a
37	934.07	1868.22	1694	123	75	955	1.94	a
38	963.72	1927.45	207	104	82	1002	2.40	a
39	1051.91	2103.58	125	58	44	443	1.15	a
40	1069.97	2139.66	74	55	43	436	1.10	a
41	1103.83	2207.28	125	106	85	1032	3.16	a Wide Pk
42	1120.19	2239.97	7537	190	63	702	2.12	a HiResid
43	1133.36	2266.28	120	89	71	797	2.59	a
44	1155.07	2309.63	887	100	66	718	2.44	a
45	1181.46	2362.35	98	67	52	528	1.87	a
46	1207.59	2414.54	127	70	55	552	2.02	a
47	1238.05	2475.37	2638	124	58	565	2.22	a
48	1252.76	2504.75	126	100	80	870	3.51	a Wide Pk
49	1281.08	2561.33	636	84	56	547	2.14	a
50	1377.48	2753.88	1940	114	59	575	2.39	a
51	1385.00	2768.88	316	77	56	537	2.25	b
52	1401.45	2801.74	585	84	56	537	2.26	a
53	1407.92	2814.67	1043	91	53	498	2.16	b
54	1509.06	3016.68	864	97	63	658	2.47	a
55	1538.30	3075.09	194	93	73	730	3.28	a
56	1543.48	3085.44	183	72	55	511	2.31	b
57	1583.10	3164.57	233	69	51	424	2.43	a
58	1661.22	3320.60	388	68	45	302	2.93	a
59	1684.46	3367.02	31	28	21	103	1.19	a Wide Pk
60	1692.45	3382.98	8	65	53	352	4.00	b NET< CL
61	1693.17	3384.42	136	63	48	308	3.46	c
62	1729.38	3456.74	1218	83	37	212	2.66	a
63	1764.35	3526.58	5734	157	34	176	2.71	a HiResid
64	1838.39	3674.47	179	58	42	203	4.47	a Wide Pk
65	1847.27	3692.21	821	68	30	135	2.90	b
66	1872.64	3742.89	63	48	37	195	3.07	a
67	1897.59	3792.72	29	29	22	99	1.59	a
68	1936.72	3870.87	43	46	36	187	3.08	a

080642D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File:. DET030711.BKG (080711-3 WEEKLY BACKGROUND)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.76	7008	332	236	7005	332	236	
2	77.01	11547	315	189	11544	315	189	
7	186.13	8665	283	175	8656	283	175	
8	241.93	13185	300	159	13183	300	159	
9	258.81	840	173	134	839	173	134	
11	295.15	28411	376	137	28408	376	137	
13	351.81	47776	461	120	47772	461	120	
22	510.12	296	139	111	254	140	112	
26	609.22	36568	395	82	36565	395	82	
37	934.07	1694	123	75	1693	123	75	
38	963.72	207	104	82	205	104	82	
63	1764.35	5734	157	34	5733	157	34	

080642D03.SPC Analyzed by

SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813512-3 GEO 26 EFF CAL (435)

Stds. Match Tolerance: 2.00 keV

Detector Number: 03 Calibration Date. . . 07/16/2008 09:28:19

Geometry File (D03)(Sh26).eff ID. Geo 26 Eff Cal

Amount of Std. in Calib. Source: 215.000000 gm

Eff = Spline Fit

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	295.22	1.45e-02	0.00	1.45e-02	0.00	0.00e+00
2	351.99	1.26e-02	0.00	1.26e-02	0.00	0.00e+00
3	609.32	7.77e-03	0.00	7.77e-03	0.00	0.00e+00
4	1120.28	4.92e-03	0.00	4.92e-03	0.00	0.00e+00

Calibration Results Saved.

OK
m.c.
7/24/08

Standards File. Gsstd26.std
Assay Date 10/04/1996 10:00
ID.: Geo. 26 (std# 435) 215g can (Ra-226)

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
=====					
1	Ra-226	295.22	1.600E+03 yrs	0.19200	26.50
2	Ra-226	351.99	1.600E+03 yrs	0.37100	26.50
3	Ra-226	609.32	1.600E+03 yrs	0.46100	26.50
4	Ra-226	1120.28	1.600E+03 yrs	0.15000	26.50



ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

Source # 435
TCCO 10-10-96

53012-307

Ra-226 Sand in 3 Inch Can Filled to Capacity

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a master radionuclide solution standard. The master radionuclide solution standard was calibrated by the National Institute of Standards and Technology as SRM 4967. Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-226
ACTIVITY (dps):	5702
CALIBRATION DATE:	October 4, 1996 12:00 EST
HALF-LIFE:	1600 years
PERCENT ERROR:	5.0

215.1 grams of sand.

P O NUMBER

SOURCE PREPARED BY:

M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED:

DM. Bty 10-4-96

~~Calibration Source Reverified. Expires 7/3/07.~~
~~MC 7/24/08~~
~~RG 7/19/06~~

SOURCE RE-VERIFIED ON 6/16/08.
EXPIRES 6/16/09.

MC
7/24/08

Geo 26		Halflife (yr)	Orig Act	Decay Act.	Rprt Act.	% Rec.
Std # :	144	Ra-226	472.9	472.9	444	93.9%
Std Date:	12/11/1995					
Decay Date:	12/11/1995					

OK
MC
7/24/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813512-3 GEO 26 LCS VER (144)

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Sampling Start:   12/11/1995 10:00:00 | Counting Start:   07/17/2008 09:52:44
Sampling Stop:    12/11/1995 10:00:00 | Decay Time. . . . . 1.10E+005 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1833 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 080649D03.SPC
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Detector #: 3 (Detector 3)

Energy(keV) = -1.26 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 07/17/2008

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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=====
PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.77	151.84	4388	269	193	5883	1.27	a
2	77.05	156.39	7429	266	167	4736	1.09	b
3	79.21	160.71	502	159	125	3169	0.87	c
4	84.08	170.43	247	233	190	5318	1.52	d
5	87.13	176.53	3481	235	167	4420	1.32	e
6	89.82	181.89	1270	192	146	3659	1.07	f
7	186.12	374.22	5741	214	125	3290	1.06	a HiResid
8	241.95	485.72	8044	228	116	2636	1.17	a
9	258.72	519.22	435	148	116	2503	1.31	a
10	274.60	550.93	345	133	105	2159	1.23	a
11	295.18	592.04	17853	300	111	2292	1.24	a
12	305.29	612.22	87	104	84	1482	0.97	a
13	323.24	648.07	74	76	61	915	0.70	a
14	333.00	667.56	86	112	91	1636	1.17	a NET< CL
15	351.81	705.14	29674	365	99	1812	1.26	a HiResid
16	386.93	775.28	239	90	70	1026	0.96	a
17	388.98	779.37	254	100	78	1197	1.09	b
18	406.47	814.30	183	129	103	1758	1.69	a
19	454.88	910.99	221	108	85	1198	1.56	a
20	461.78	924.76	219	108	85	1198	1.71	b
21	468.97	939.11	88	105	85	1198	1.59	c
22	480.69	962.52	238	95	74	959	1.43	a
23	487.12	975.36	238	95	74	959	1.43	b
24	510.93	1022.92	258	134	107	1479	2.51	a Wide Pk

=====
 PEAK SEARCH RESULTS
 =====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	533.69	1068.37	127	81	64	756	1.34	a
26	580.09	1161.04	107	75	59	725	1.34	a
27	609.26	1219.30	22448	310	67	822	1.63	a HiResid
28	665.57	1331.75	659	80	51	500	1.43	a
29	703.30	1407.12	189	75	57	600	1.66	a
30	719.98	1440.43	127	69	54	538	1.66	a
31	742.21	1484.82	66	63	50	488	1.49	a
32	768.42	1537.16	1987	115	60	610	1.95	a
33	785.98	1572.24	492	77	51	487	1.64	a
34	806.27	1612.76	449	79	55	561	1.68	a
35	839.28	1678.67	220	76	58	583	1.74	a
36	905.00	1809.94	51	63	51	503	1.55	a
37	934.14	1868.13	1061	95	57	576	1.87	a
38	964.03	1927.83	118	60	46	407	1.45	a
39	1052.42	2104.36	107	66	52	478	2.19	a
40	1120.26	2239.84	4710	150	49	427	2.20	a HiResid
41	1155.32	2309.85	452	69	44	377	1.84	a
42	1207.46	2413.99	90	60	47	373	2.23	a
43	1238.08	2475.15	1660	100	48	389	2.23	a
44	1253.14	2505.22	44	72	58	485	3.10	a NET< CL
45	1281.20	2561.26	309	61	41	324	1.73	a
46	1377.64	2753.88	1248	88	43	319	2.31	a
47	1385.32	2769.21	162	53	38	273	1.98	b
48	1401.54	2801.61	432	62	37	259	2.05	a
49	1408.15	2814.81	637	72	42	302	2.27	b
50	1509.33	3016.88	569	77	50	409	2.53	a
51	1543.98	3086.07	69	44	33	234	1.45	a
52	1572.26	3142.56	36	30	23	118	1.19	a
53	1583.23	3164.46	179	59	43	288	2.80	b
54	1661.52	3320.83	201	49	33	164	2.72	a
55	1693.81	3385.31	49	37	28	134	2.32	a
56	1729.51	3456.61	770	65	27	111	2.90	a
57	1764.48	3526.44	3603	126	31	143	2.74	a HiResid
58	1847.43	3692.10	470	54	27	112	2.74	a

080649D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET030711.BKG (080711-3 WEEKLY BACKGROUND)

Bkg.File Detector #: 3

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	74.77	4388	269	193	4385	269	193	
2	77.05	7429	266	167	7426	266	167	
7	186.12	5741	214	125	5732	215	125	
8	241.95	8044	228	116	8042	228	116	
9	258.72	435	148	116	433	148	116	
11	295.18	17853	300	111	17849	300	111	
15	351.81	29674	365	99	29670	365	99	
24	510.93	258	134	107	216	135	108	
27	609.26	22448	310	67	22445	310	67	
37	934.14	1061	95	57	1060	95	57	
38	964.03	118	60	46	116	60	46	
57	1764.48	3603	126	31	3602	126	31	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0813512-3 GEO 26 LCS VER (144)

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Sampling Start:    12/11/1995 10:00:00 | Counting Start:    07/17/2008 09:52:44
Sampling Stop:    12/11/1995 10:00:00 | Decay Time. . . . . 1.10e+005 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15e+002 g | Real Time . . . . . 1833 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 080649D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 07/16/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Halflife (hrs)
Ra-226	Average:x	4.44E+02 +- 3.47E+00	. . . . .	. . . . .	1.40E+07
	295.21	4.50E+02 +- 7.56E+00	5.69E+00	2.81E+00	1.40E+07
	351.92	4.45E+02 +- 5.47E+00	3.01E+00	1.49E+00	1.40E+07
	609.31	4.40E+02 +- 6.08E+00	2.67E+00	1.31E+00	1.40E+07
	1120.29	4.45E+02 +- 1.41E+01	9.52E+00	4.63E+00	1.40E+07

MEASURED TOTAL: 4.44E+02 +- 3.47E+00 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.77	151.84	4385	269	193	5883	1.27	Unknown
2	77.05	156.39	7426	266	167	4736	1.09	Unknown
3	79.21	160.71	502	159	125	3169	0.87	Unknown
4	84.08	170.43	247	233	190	5318	1.52	Unknown
5	87.13	176.53	3481	235	167	4420	1.32	Unknown
6	89.82	181.89	1270	192	146	3659	1.07	Unknown
7	186.12	374.22	5732	215	125	3290	1.06	Unknown
8	241.95	485.72	8042	228	116	2636	1.17	Unknown
9	258.72	519.22	433	148	116	2503	1.31	1281DEsc
10	274.60	550.93	345	133	105	2159	1.23	Unknown
12	305.29	612.22	87	104	84	1482	0.97	Unknown

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
13	323.24	648.07	74	76	61	915	0.70	Unknown
14	333.00	667.56	86	112	91	1636	1.17	Deleted
16	386.93	775.28	239	90	70	1026	0.96	1408DEsc
17	388.98	779.37	254	100	78	1197	1.09	Unknown
18	406.47	814.30	183	129	103	1758	1.69	Unknown
19	454.88	910.99	221	108	85	1198	1.56	Unknown
20	461.78	924.76	219	108	85	1198	1.71	Unknown
21	468.97	939.11	88	105	85	1198	1.59	Unknown
22	480.69	962.52	238	95	74	959	1.43	Unknown
23	487.12	975.36	238	95	74	959	1.43	1509DEsc
24	510.93	1022.92	216	135	108	1479	2.51	Unknown
25	533.69	1068.37	127	81	64	756	1.34	Unknown
26	580.09	1161.04	107	75	59	725	1.34	Unknown
28	665.57	1331.75	659	80	51	500	1.43	Unknown
29	703.30	1407.12	189	75	57	600	1.66	Unknown
30	719.98	1440.43	127	69	54	538	1.66	Unknown
31	742.21	1484.82	66	63	50	488	1.49	1764DEsc
32	768.42	1537.16	1987	115	60	610	1.95	1281SEsc
33	785.98	1572.24	492	77	51	487	1.64	Unknown
34	806.27	1612.76	449	79	55	561	1.68	Unknown
35	839.28	1678.67	220	76	58	583	1.74	Unknown
36	905.00	1809.94	51	63	51	503	1.55	Unknown
37	934.14	1868.13	1060	95	57	576	1.87	Unknown
38	964.03	1927.83	116	60	46	407	1.45	Unknown
39	1052.42	2104.36	107	66	52	478	2.19	Unknown
41	1155.32	2309.85	452	69	44	377	1.84	Unknown
42	1207.46	2413.99	90	60	47	373	2.23	Unknown
43	1238.08	2475.15	1660	100	48	389	2.23	Unknown
44	1253.14	2505.22	44	72	58	485	3.10	Deleted
45	1281.20	2561.26	309	61	41	324	1.73	Unknown
46	1377.64	2753.88	1248	88	43	319	2.31	Unknown
47	1385.32	2769.21	162	53	38	273	1.98	Unknown
48	1401.54	2801.61	432	62	37	259	2.05	Unknown
49	1408.15	2814.81	637	72	42	302	2.27	Unknown
50	1509.33	3016.88	569	77	50	409	2.53	Unknown
51	1543.98	3086.07	69	44	33	234	1.45	Unknown
52	1572.26	3142.56	36	30	23	118	1.19	Unknown
53	1583.23	3164.46	179	59	43	288	2.80	Unknown
54	1661.52	3320.83	201	49	33	164	2.72	Unknown
55	1693.81	3385.31	49	37	28	134	2.32	Unknown
56	1729.51	3456.61	770	65	27	111	2.90	Unknown
57	1764.48	3526.44	3602	126	31	143	2.74	Unknown
58	1847.43	3692.10	470	54	27	112	2.74	Unknown



Analytics, Inc.
1380 Seaboard Industrial Boulevard
Atlanta, Georgia 30318
404 352-8677

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

ATI 120 0144
rec'd 12-12-95

51290-307

Ra-226 Sand in Steel Can

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a calibrated master radionuclide solution source which was calibrated using a germanium gamma spectrometer system. This calibration has been confirmed by the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system and alpha spectroscopy system. The nuclear decay rate and assay date for this source are given below.

ISOTOPE:	Ra-226
ACTIVITY (dps):	3762
HALF-LIFE:	1600 years
CALIBRATION DATE:	December 11, 1995 12:00 EST
TOTAL ERROR:	4.9%
SYSTEMATIC ERROR:	3.5%
RANDOM ERROR:	1.4%

215 grams of sand. 2 1/8" OD X 2 7/8" H.

P O NUMBER 51393, Item 1

SOURCE PREPARED BY:

M. D. Currie
Mr. D. Currie, Radiochemist

Q A APPROVED:

Dr. Mary 12-11-95

~~Source re-verified on 6/13/2007. MC 7/24/08~~
~~Expires: 6/13/2008 MC 7/24/08~~
~~PG 7/24/07 MC 7/24/08~~

SOURCE RE-VERIFIED ON 6/16/08.
EXPIRES 6/16/09.
MC 7/24/08

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0813512-8 GEO 26 EFF CAL (435)

 Sampling Start: 10/04/1996 10:00:00 | Counting Start: 07/21/2008 08:38:27
 Sampling Stop: 10/04/1996 10:00:00 | Decay Time. 1.03E+005 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
 Sample Size 2.15E+002 g | Real Time 1851 Sec
 Collection Efficiency 1.0000 | Spc. File 081410D08.SPC

Detector #: 8 (Detector 8)

Energy(keV) = -1.47 + 0.500*Ch + 1.96E-07*Ch^2 + 0.00E+00*Ch^3 07/21/2008

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.49	95.90	5109	209	126	3514	0.70 a	
2	53.15	109.22	1677	179	131	3808	0.65 a	HiResid
3	74.77	152.44	15199	353	207	8672	0.82 a	HiResid
4	77.09	157.08	26882	401	189	7230	0.85 b	HiResid
5	79.32	161.54	643	192	152	5117	0.59 c	HiResid
6	81.05	165.00	53	116	95	2481	0.38 d	NET< CL HiResid
7	83.81	170.51	231	180	146	4703	0.65 e	HiResid
8	87.18	177.25	8999	296	187	6461	0.92 f	HiResid
9	89.84	182.57	3159	219	155	4830	0.86 g	HiResid
10	94.85	192.58	176	101	80	1776	0.39 a	
11	102.46	207.81	163	176	144	4152	0.80 a	
12	186.18	375.17	9704	266	147	4381	0.86 a	
13	196.03	394.85	219	198	161	4787	0.95 a	
14	204.37	411.53	93	115	94	2157	0.47 a	NET< CL
15	207.26	417.32	44	115	94	2157	0.46 b	NET< CL
16	216.59	435.96	130	153	125	3133	0.85 a	
17	238.74	480.23	165	125	100	2227	0.65 a	
18	241.93	486.62	13899	287	134	3341	0.94 b	
19	258.85	520.42	890	144	108	2331	0.87 a	
20	274.42	551.56	777	186	146	3379	1.35 a	
21	295.15	592.99	30528	376	114	2421	0.95 a	HiResid
22	299.08	600.84	48	122	100	2018	0.90 b	NET< CL HiResid

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
23	305.15	612.98	119	183	149	3296	1.49	a NET< CL
24	314.10	630.86	102	117	95	1815	0.84	a
25	351.91	706.42	50135	468	111	2270	1.02	a
26	386.76	776.07	349	136	107	1962	1.16	a
27	388.79	780.13	448	123	95	1682	0.96	b
28	405.73	813.99	202	148	120	2263	1.24	a
29	454.79	912.02	169	91	72	1032	0.84	a
30	462.43	927.27	281	192	155	2964	2.59	a Wide Pk
31	469.62	941.65	140	79	62	881	0.89	a
32	480.55	963.48	284	90	69	1000	0.99	a
33	487.18	976.74	398	102	77	1166	1.22	b
34	509.49	1021.31	105	80	64	853	0.93	a Wide Pk
35	511.11	1024.56	433	154	122	1990	2.22	b
36	533.80	1069.88	121	90	72	1013	1.11	a
37	543.35	1088.96	99	111	90	1321	1.61	a
38	580.15	1162.49	284	80	60	749	0.94	a
39	609.35	1220.82	37899	399	71	929	1.27	a
40	665.47	1332.92	1045	93	54	585	1.14	a
41	683.22	1368.38	28	48	38	359	0.69	a NET< CL
42	698.43	1398.76	63	55	44	431	0.78	a
43	703.22	1408.33	323	83	61	690	1.38	b
44	719.81	1441.46	243	74	55	598	1.22	a
45	742.85	1487.48	110	63	49	503	0.94	a
46	752.77	1507.30	94	62	48	488	1.05	a
47	768.33	1538.38	3276	139	65	734	1.45	a
48	785.86	1573.38	754	96	64	721	1.50	a
49	806.21	1614.03	731	85	53	563	1.21	a
50	821.25	1644.06	78	55	43	447	0.86	a
51	839.01	1679.52	473	84	59	684	1.41	a
52	934.01	1869.22	1824	112	60	690	1.43	a
53	963.96	1929.03	191	70	53	579	1.23	a
54	1013.55	2028.03	58	68	55	578	1.54	a
55	1026.65	2054.18	50	44	35	296	0.85	a
56	1051.99	2104.78	190	72	55	559	1.63	a
57	1070.09	2140.90	154	61	46	427	1.39	a
58	1120.36	2241.25	7916	190	54	540	1.70	a
59	1133.70	2267.89	129	67	52	505	1.60	a
60	1155.12	2310.64	793	91	58	601	1.77	a
61	1172.76	2345.85	30	61	49	452	1.68	a NET< CL
62	1182.43	2365.14	67	49	38	319	1.08	a
63	1207.56	2415.30	216	67	50	481	1.76	a
64	1238.20	2476.45	2726	121	50	479	1.77	a
65	1253.56	2507.11	234	86	66	669	2.84	a
66	1280.88	2561.63	716	78	47	422	1.87	a
67	1316.29	2632.29	52	59	47	420	1.74	a
68	1336.17	2671.97	42	53	43	365	1.62	a NET< CL
69	1377.72	2754.86	1911	105	47	435	1.85	a
70	1385.25	2769.88	318	68	47	435	1.77	b
71	1401.56	2802.44	548	75	48	444	1.72	a

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PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
72	1407.94	2815.16	965	85	48	444	1.74	b
73	1425.67	2850.54	43	47	37	308	1.38	a
74	1509.24	3017.26	908	86	51	479	2.04	a
75	1538.56	3075.76	173	62	46	415	1.79	a
76	1543.45	3085.52	204	67	50	453	1.99	b
77	1583.51	3165.41	264	59	41	323	1.83	a
78	1595.00	3188.34	133	51	38	273	1.87	a
79	1599.33	3196.97	113	53	40	298	1.91	b
80	1661.28	3320.53	429	60	36	219	2.24	a
81	1684.02	3365.88	59	29	20	93	1.12	a
82	1693.08	3383.96	109	55	42	252	3.06	b
83	1729.66	3456.90	1342	80	27	128	2.28	a
84	1764.61	3526.60	6112	161	31	169	2.22	a HiResid
85	1838.30	3673.54	111	38	26	122	2.11	a
86	1847.52	3691.92	841	66	26	122	2.13	b
87	1872.72	3742.17	48	38	29	139	2.45	a
88	1896.81	3790.19	54	38	29	151	2.12	a
89	1936.98	3870.28	72	48	37	192	3.24	a

081410D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File:. DET080718.BKG (080718-8 WEEKLY BACKGROUND)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.49	5109	209	126	5093	209	126	
2	53.15	1677	179	131	1673	179	131	
3	74.77	15199	353	207	15193	353	207	
4	77.09	26882	401	189	26876	401	189	
7	83.81	231	180	146	228	180	146	
8	87.18	8999	296	187	8997	296	187	
12	186.18	9704	266	147	9694	266	148	
17	238.74	165	125	100	155	125	100	
18	241.93	13899	287	134	13897	287	135	
21	295.15	30528	376	114	30526	376	115	
25	351.91	50135	468	111	50129	468	111	
30	462.43	281	192	155	281	192	155	
34	509.49	105	80	64	52	80	65	NET<CL
39	609.35	37899	399	71	37894	399	71	
84	1764.61	6112	161	31	6110	161	32	

081410D08.SPC Analyzed by

SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0813512-8 GEO 26 EFF CAL (435)

Stds. Match Tolerance: 2.00 keV

Detector Number: 08 Calibration Date. . . 07/21/2008 08:38:27

Geometry File (D08)(Sh26).eff ID. Geo 26 Eff Cal

Amount of Std. in Calib. Source: 215.000000 gm

Eff = Spline Fit

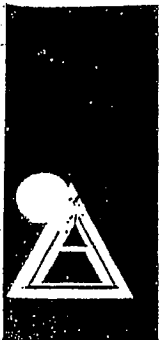
Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	295.22	1.56e-02	0.00	1.56e-02	0.00	0.00e+00
2	351.99	1.32e-02	0.00	1.32e-02	0.00	0.00e+00
3	609.32	8.04e-03	0.00	8.04e-03	0.00	0.00e+00
4	1120.28	5.16e-03	0.00	5.16e-03	0.00	0.00e+00

Calibration Results Saved.

GK
MC
7/24/08

Standards File. Gsstd26.std
Assay Date 10/04/1996 10:00
ID.: Geo. 26 (std# 435) 215g can (Ra-226)

Pk #	Nuclide	Energy	Halflife	Br.Ratio	dps/gm
1	Ra-226	295.22	1.600E+03 yrs	0.19200	26.50
2	Ra-226	351.99	1.600E+03 yrs	0.37100	26.50
3	Ra-226	609.32	1.600E+03 yrs	0.46100	26.50
4	Ra-226	1120.28	1.600E+03 yrs	0.15000	26.50



ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 - U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

Source # 435
Rec'd 10-10-96

53012-307

Ra-226 Sand in 3 Inch Can Filled to Capacity

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a master radionuclide solution standard. The master radionuclide solution standard was calibrated by the National Institute of Standards and Technology as SRM 4967. Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-226
ACTIVITY (dps):	5702
CALIBRATION DATE:	October 4, 1996 12:00 EST
HALF-LIFE:	1600 years
PERCENT ERROR:	5.0

215.1 grams of sand.

P O NUMBER

SOURCE PREPARED BY:

M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED:

DM. Rty 10-4-96

~~Calibration Source Reverified. Expires 7/8/07.~~
~~MC 7/24/08~~
~~BC 7/19/06~~

SOURCE RE-VERIFIED ON 6/16/08.
EXPIRES 6/16/09.

MC
7/24/08

Geo 26		Halflife (yr)	Orig Act	Decay Act.	Rprt Act.	% Rec.
Std # :	144	1600	472.9	472.9	452	95.6%
Std Date:	12/11/1995					
Decay Date:	12/11/1995					

OK
MC
7/24/08

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Geo 17/26

Sample ID: 0813512-8 GEO 26 LCS VER (144)

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Sampling Start: 12/11/1995 10:00:00 | Counting Start: 07/21/2008 09:15:45
Sampling Stop: 12/11/1995 10:00:00 | Decay Time. . . . . 1.11E+005 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15E+002 g | Real Time . . . . . 1832 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 081411D08.SPC
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Detector #: 8 (Detector 8)

Energy(keV) = -1.47 + 0.500*Ch + 1.96E-07*Ch^2 + 0.00E+00*Ch^3 07/21/2008

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.49	95.89	1413	137	95	1987	0.72	a
2	53.25	109.41	1007	122	85	1797	0.55	a
3	74.86	152.63	8311	293	189	6596	0.99	a HiResid
4	77.09	157.09	18126	325	150	4510	0.84	b HiResid
5	79.29	161.48	235	123	98	2357	0.56	c HiResid
6	81.05	165.00	26	90	74	1504	0.38	d NET< CL HiResid
7	83.95	170.79	285	165	133	3551	0.77	e HiResid
8	87.17	177.23	6759	240	143	3803	0.98	f HiResid
9	89.90	182.69	2114	170	117	2765	0.85	g HiResid
10	94.83	192.54	200	80	62	1060	0.40	a
11	97.63	198.14	90	141	115	2651	0.77	b NET< CL
12	186.18	375.17	6649	215	115	2664	0.88	a
13	188.66	380.13	35	99	81	1599	0.45	b NET< CL
14	196.06	394.93	108	138	112	2538	0.84	a NET< CL
15	241.93	486.62	8751	229	108	2162	0.91	a
16	258.78	520.29	507	113	85	1473	0.79	a
17	274.63	551.97	354	107	83	1376	0.85	a
18	281.25	565.20	87	100	81	1323	0.83	a
19	295.16	593.00	19105	298	92	1571	0.97	a
20	333.37	669.38	73	77	61	835	0.71	a
21	351.91	706.43	31776	371	84	1310	1.02	a
22	386.69	775.93	156	95	75	1046	0.98	a
23	388.82	780.18	327	109	85	1220	1.08	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	405.87	814.26	175	117	93	1380	1.31	a
25	454.77	911.99	146	70	54	595	0.83	a
26	461.25	924.91	68	71	57	686	1.05	a
27	462.70	927.82	75	63	50	571	0.88	b
28	469.78	941.96	58	64	51	593	0.79	a
29	474.02	950.44	37	55	44	474	0.60	b NET< CL
30	480.47	963.32	200	65	49	535	0.87	a
31	486.92	976.22	234	96	74	963	1.43	b
32	509.79	1021.91	80	71	56	627	1.06	a Wide Pk
33	511.23	1024.78	312	129	102	1343	2.47	b
34	533.74	1069.77	90	64	50	530	0.99	a
35	543.10	1088.46	63	69	55	605	1.18	a
36	580.04	1162.25	157	65	49	506	0.99	a
37	609.36	1220.83	24106	318	55	561	1.29	a
38	665.41	1332.80	695	81	50	471	1.25	a
39	703.18	1408.24	206	58	42	365	0.97	a
40	719.97	1441.78	179	59	43	365	1.19	a
41	742.64	1487.06	58	50	39	329	0.93	a
42	753.21	1508.17	58	44	34	259	0.83	a
43	759.44	1520.61	17	58	47	414	1.27	b NET< CL
44	768.31	1538.34	1980	106	47	406	1.32	a
45	785.89	1573.43	517	74	48	401	1.51	a
46	806.22	1614.05	568	79	51	434	1.65	a
47	820.58	1642.72	44	65	53	482	1.43	a NET< CL
48	825.26	1652.06	43	81	66	642	1.89	b NET< CL
49	839.11	1679.72	279	68	49	463	1.43	a
50	934.05	1869.29	1107	86	44	383	1.54	a
51	964.17	1929.45	118	55	42	359	1.38	a
52	1052.24	2105.27	89	63	49	406	2.04	a
53	1070.06	2140.85	80	56	44	357	1.59	a
54	1120.39	2241.31	4913	150	43	339	1.69	a
55	1133.74	2267.95	56	35	26	169	0.89	a
56	1155.16	2310.71	534	71	44	341	1.84	a
57	1207.79	2415.76	140	53	39	298	1.77	a
58	1238.15	2476.35	1736	95	38	277	1.81	a
59	1280.99	2561.84	443	62	38	279	1.73	a
60	1377.67	2754.78	1253	83	35	241	1.85	a
61	1385.45	2770.29	218	59	42	307	2.21	b
62	1401.45	2802.21	326	58	38	276	1.83	a
63	1407.92	2815.13	623	70	40	301	2.02	b
64	1509.23	3017.25	565	67	39	294	1.75	a
65	1538.49	3075.62	122	57	43	313	2.26	a
66	1543.16	3084.93	135	60	45	335	2.46	b
67	1583.20	3164.80	169	50	35	220	2.07	a
68	1661.29	3320.55	227	42	24	111	1.86	a
69	1684.00	3365.84	54	29	21	88	1.60	a
70	1692.98	3383.75	62	41	31	150	2.82	b
71	1729.69	3456.96	795	63	23	91	2.23	a
72	1764.57	3526.53	3817	127	22	89	2.20	a

=====

PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
73	1838.55	3674.04	65	28	19	69	1.92	a
74	1847.52	3691.92	513	52	22	81	2.27	b
75	1873.12	3742.96	71	38	28	100	3.76	a Wide Pk
76	1936.19	3868.70	35	45	36	149	4.40	a NET< CL Wide Pk

=====

081411D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab

GammaScan

Background File: DET080718.BKG (080718-8 WEEKLY BACKGROUND)

Bkg.File Detector #: 8

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.49	1413	137	95	1398	138	95	
2	53.25	1007	122	85	1003	122	86	
3	74.86	8311	293	189	8304	293	189	
4	77.09	18126	325	150	18120	325	150	
7	83.95	285	165	133	281	165	133	
8	87.17	6759	240	143	6757	240	144	
12	186.18	6649	215	115	6639	215	115	
13	188.66	35	99	81	33	99	81	NET<CL
15	241.93	8751	229	108	8748	229	108	
19	295.16	19105	298	92	19102	298	92	
21	351.91	31776	371	84	31771	371	84	
26	461.25	68	71	57	67	71	57	
32	509.79	80	71	56	27	71	58	NET<CL
37	609.36	24106	318	55	24101	318	55	
72	1764.57	3817	127	22	3816	127	23	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 17/26

Sample ID: 0813512-8 GEO 26 LCS VER (144)

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Sampling Start:    12/11/1995 10:00:00 | Counting Start:    07/21/2008 09:15:45
Sampling Stop:    12/11/1995 10:00:00 | Decay Time. . . . . 1.11e+005 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 2.15e+002 g | Real Time . . . . . 1832 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 081411D08.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 8 (Detector 8)

Efficiency File: (D08)(Sh26).eff (Geo 26 Eff Cal)

Eff.= Spline Fit 07/21/2008

Library File: RA226.LIB (Ra-226 (215g steel can))

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/g)	MDA	Critical Level	Half-life (hrs)
Ra-226	Average: x	4.52E+02 +- 3.95E+00	. . . . .	. . . . .	1.40E+07
	295.21	4.49E+02 +- 7.01E+00	4.40E+00	2.17E+00	1.40E+07
	351.92	4.55E+02 +- 5.31E+00	2.45E+00	1.21E+00	1.40E+07
	609.31	4.52E+02 +- 1.88E+01	2.59E+01	1.29E+01	1.40E+07
	1120.29	4.42E+02 +- 1.35E+01	7.96E+00	3.86E+00	1.40E+07

MEASURED TOTAL: 4.52E+02 +- 3.95E+00 pCi/g

=====

UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.49	95.89	1398	138	95	1987	0.72	Unknown
2	53.25	109.41	1003	122	86	1797	0.55	Unknown
3	74.86	152.63	8304	293	189	6596	0.99	Unknown
4	77.09	157.09	18120	325	150	4510	0.84	Unknown
5	79.29	161.48	235	123	98	2357	0.56	Unknown
6	81.05	165.00	26	90	74	1504	0.38	Deleted
7	83.95	170.79	281	165	133	3551	0.77	Unknown
8	87.17	177.23	6757	240	144	3803	0.98	Unknown
9	89.90	182.69	2114	170	117	2765	0.85	Unknown
10	94.83	192.54	200	80	62	1060	0.40	Unknown
11	97.63	198.14	90	141	115	2651	0.77	Deleted

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
12	186.18	375.17	6639	215	115	2664	0.88	1208DEsc
13	188.66	380.13	33	99	81	1599	0.45	Deleted
14	196.06	394.93	108	138	112	2538	0.84	Deleted
15	241.93	486.62	8748	229	108	2162	0.91	Unknown
16	258.78	520.29	507	113	85	1473	0.79	1281DEsc
17	274.63	551.97	354	107	83	1376	0.85	Unknown
18	281.25	565.20	87	100	81	1323	0.83	Unknown
20	333.37	669.38	73	77	61	835	0.71	Unknown
22	386.69	775.93	156	95	75	1046	0.98	1408DEsc
23	388.82	780.18	327	109	85	1220	1.08	Unknown
24	405.87	814.26	175	117	93	1380	1.31	Unknown
25	454.77	911.98	146	70	54	595	0.83	Unknown
26	461.25	924.91	67	71	57	686	1.05	Unknown
27	462.70	927.82	75	63	50	571	0.88	Unknown
28	469.78	941.96	58	64	51	593	0.79	Unknown
29	474.02	950.44	37	55	44	474	0.60	Deleted
30	480.47	963.32	200	65	49	535	0.87	Unknown
31	486.92	976.22	234	96	74	963	1.43	1509DEsc
32	509.79	1021.91	27	71	58	627	1.06	Deleted
33	511.23	1024.78	312	129	102	1343	2.47	Unknown
34	533.74	1069.77	90	64	50	530	0.99	Unknown
35	543.10	1088.46	63	69	55	605	1.18	Unknown
36	580.04	1162.25	157	65	49	506	0.99	Unknown
37	609.36	1220.83	24101	318	55	561	1.29	SPLIT
38	665.41	1332.80	695	81	50	471	1.25	Unknown
39	703.18	1408.24	206	58	42	365	0.97	Unknown
40	719.97	1441.78	179	59	43	365	1.19	Unknown
41	742.64	1487.06	58	50	39	329	0.93	1765DEsc
42	753.21	1508.17	58	44	34	259	0.83	Unknown
43	759.44	1520.61	17	58	47	414	1.27	Deleted
44	768.31	1538.34	1980	106	47	406	1.32	1281SEsc
45	785.89	1573.43	517	74	48	401	1.51	Unknown
46	806.22	1614.05	568	79	51	434	1.65	Unknown
47	820.58	1642.72	44	65	53	482	1.43	Deleted
48	825.26	1652.06	43	81	66	642	1.89	Deleted
49	839.11	1679.72	279	68	49	463	1.43	Unknown
50	934.05	1869.29	1107	86	44	383	1.54	Unknown
51	964.17	1929.45	118	55	42	359	1.38	Unknown
52	1052.24	2105.27	89	63	49	406	2.04	Unknown
53	1070.06	2140.85	80	56	44	357	1.59	Unknown
55	1133.74	2267.95	56	35	26	169	0.89	Unknown
56	1155.16	2310.71	534	71	44	341	1.84	Unknown
57	1207.79	2415.76	140	53	39	298	1.77	Unknown
58	1238.15	2476.35	1736	95	38	277	1.81	Unknown
59	1280.99	2561.84	443	63	38	279	1.73	Unknown
60	1377.67	2754.78	1253	83	35	241	1.85	Unknown
61	1385.45	2770.29	218	59	42	307	2.21	Unknown
62	1401.45	2802.21	326	58	38	276	1.83	Unknown
63	1407.92	2815.13	623	70	40	301	2.02	Unknown

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UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
64	1509.23	3017.25	565	67	39	294	1.75	Unknown
65	1538.49	3075.62	122	57	43	313	2.26	Unknown
66	1543.16	3084.93	135	60	45	335	2.46	Unknown
67	1583.20	3164.80	169	50	35	220	2.07	Unknown
68	1661.29	3320.55	227	42	24	111	1.86	Unknown
69	1684.00	3365.84	54	29	21	88	1.60	Unknown
70	1692.98	3383.75	62	41	31	150	2.82	Unknown
71	1729.69	3456.96	795	63	23	91	2.23	Unknown
72	1764.57	3526.53	3816	127	23	89	2.20	Unknown
73	1838.55	3674.04	65	29	19	69	1.92	Unknown
74	1847.52	3691.92	513	52	22	81	2.27	Unknown
75	1873.12	3742.96	71	38	28	100	3.76	Unknown
76	1936.19	3868.70	35	45	36	149	4.40	Deleted
78	609.36	1220.83	252	2088	55	561	1.29	1120SEsc

c:\SEEKER\BIN\081411d08.res Analysis Results Saved.



Analytix, Inc.
1380 Seaboard Industrial Boulevard
Atlanta, Georgia 30318
404 352-8677

ATI ID 0144
rec'd 12-12-95

CERTIFICATE OF CALIBRATION Standard Radionuclide Source

51290-307

Ra-226 Sand in Steel Can

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a calibrated master radionuclide solution source which was calibrated using a germanium gamma spectrometer system. This calibration has been confirmed by the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system and alpha spectroscopy system. The nuclear decay rate and assay date for this source are given below.

ISOTOPE:	Ra-226
ACTIVITY (dps):	3762
HALF-LIFE:	1600 years
CALIBRATION DATE:	December 11, 1995 12:00 EST
TOTAL ERROR:	4.9%
SYSTEMATIC ERROR:	3.5%
RANDOM ERROR:	1.4%

215 grams of sand, 2 1/8" OD X 2 7/8" H.

P O NUMBER 51393, Item 1

SOURCE PREPARED BY:

M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED:

J. M. Maly 12-11-95

~~Source re-verified on 6/13/2007. MC 7/24/08~~
~~Expires: 6/13/2008 MC 7/24/08~~
~~BG 7/17/07 MC 7/24/08~~

SOURCE RE-VERIFIED ON 6/16/08.
EXPIRES 6/16/09.
MC 7/24/08



Gamma Spectroscopy

Quality Control Data

Weekly Background Calibrations

ALS - Fort Collins

Gamma Spectrometer Calibration Log

Date: 1-10-09
mtc 1-9-09

Reviewed By/Date: mtc 1-12-09

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.	<u>mtc</u>	<u>mtc 1-9-09</u>	/	/	/					
2.		<u>mtc</u>	<u>mtc</u>	<u>mtc</u>	<u>mtc</u>					
3.		↓	↓	↓	↓					
4.		↓	↓	↓	↓		<u>mtc</u>			
5.	<u>mtc</u>	/	/	/	/					
6.		<u>mtc</u>	<u>mtc</u>	<u>mtc</u>	<u>mtc</u>					
7.		↓	↓	↓	↓					
8.	<u>mtc 1-9-09</u> <u>mtc</u>	↓	↓	/	/					
9.		↓	↓	<u>mtc</u>	<u>mtc</u>					
10.	<u>mtc</u>	/	/	/	/					

** Corrective Action: 0 Det #4 Running daily checks to set the interim control limits. mtc 1-9-09

* Det.#8 weekly background passed. Detector is online mtc 1-12-09

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Weekly Background Check

Sample ID: 090109-2 WEEKLY BKG

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Sampling Start:   01/09/2009 14:00:00 | Counting Start:   01/09/2009 14:54:37
Sampling Stop:    01/09/2009 14:00:00 | Decay Time. . . . . 9.10E-001 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 60000 Sec
Sample Size . . . . . 1.00E+000 L | Real Time . . . . . 60119 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090049D02.SPC
-----

```

Detector #: 2 (Detector 2)

Energy(keV) = -0.58 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/09/2009

FWHM(keV) = 0.69 + 0.003*En + 1.19E-03*En^2 + 0.00E+00*En^3 05/08/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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=====
PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	53.81	108.62	66	79	63	739	0.90	a
2	63.19	127.35	156	99	79	977	1.28	a Wide Pk
3	66.36	133.69	226	82	63	733	1.00	b
4	69.89	140.73	139	98	79	977	1.23	c
5	74.65	150.24	333	164	132	1833	2.41	d
6	77.12	155.17	244	74	55	611	0.89	e
7	84.60	170.11	45	79	64	762	1.05	a NET< CL
8	92.68	186.25	347	77	55	609	0.84	a
9	113.12	227.07	46	72	59	634	0.94	a NET< CL
10	139.89	280.53	178	74	57	604	1.05	a
11	144.08	288.90	111	89	71	805	1.32	b
12	154.87	310.44	36	72	59	639	0.98	a NET< CL
13	185.86	372.34	237	70	52	545	0.74	a
14	198.53	397.64	215	74	56	577	1.03	a
15	238.89	478.24	301	74	54	538	0.92	a
16	241.73	483.91	83	92	74	807	1.39	b
17	260.15	520.69	44	93	76	802	1.57	a NET< CL
18	295.62	591.53	148	70	54	503	1.17	a
19	314.73	629.71	44	45	35	273	0.64	a
20	338.60	677.38	51	45	35	279	0.62	a
21	352.06	704.24	230	85	66	597	1.60	a
22	458.18	916.18	20	34	27	183	0.65	a NET< CL
23	511.40	1022.47	1576	118	72	668	2.52	a Wide Pk
24	558.83	1117.19	239	65	47	351	1.74	a

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	570.12	1139.73	80	46	34	251	1.01	a
26	583.56	1166.58	118	63	49	391	1.63	a
27	609.73	1218.84	117	62	48	429	1.26	a
28	652.20	1303.66	26	37	29	196	1.03	a NET< CL
29	693.56	1386.26	46	42	33	248	1.00	a
30	803.63	1606.06	148	50	36	229	1.87	a
31	899.50	1797.53	56	48	37	246	2.15	a
32	912.13	1822.76	48	32	24	135	1.14	a
33	1462.17	2921.22	179	44	29	135	2.46	a
34	1765.64	3527.28	50	30	22	84	2.22	a

090049D02.SPC Analyzed by

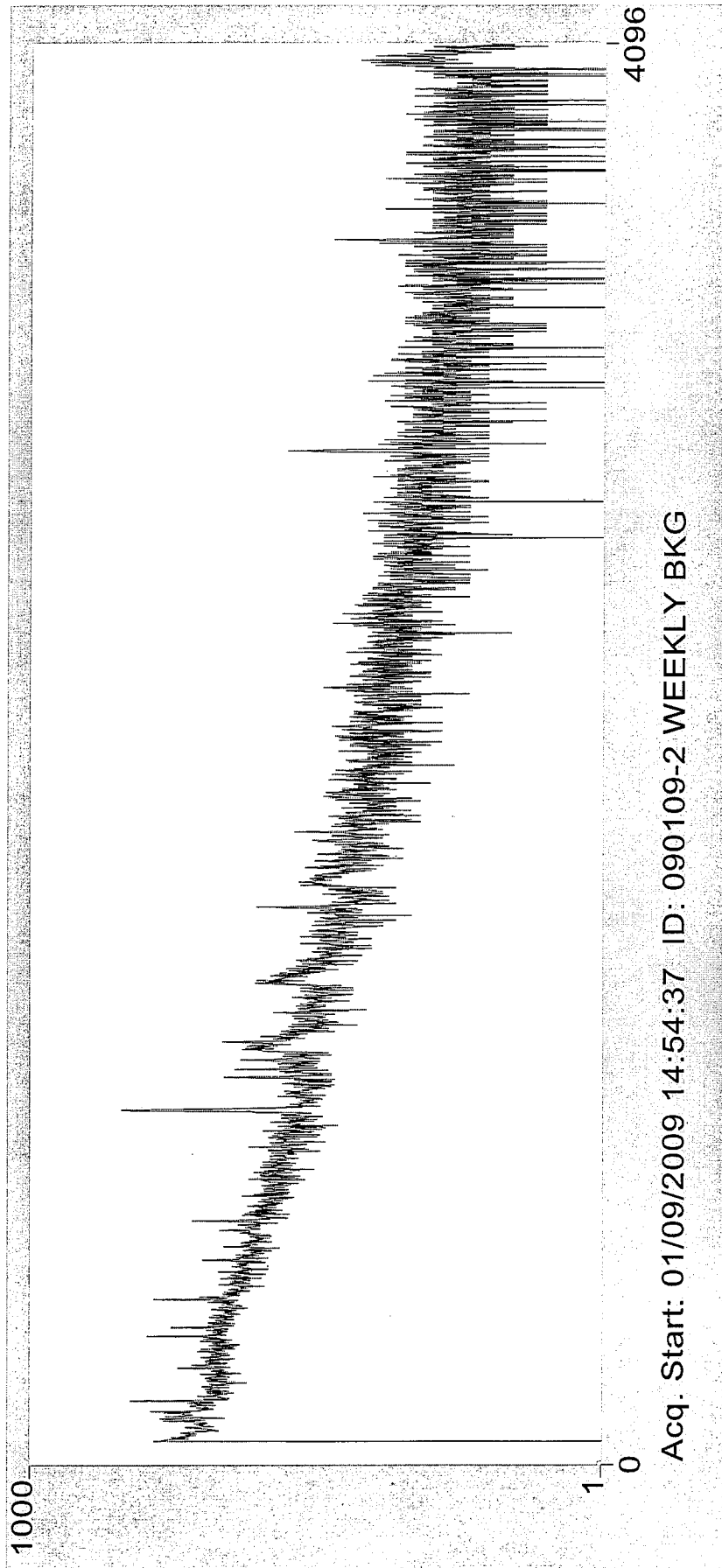
SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

ID: 090109-2 WEEKLY BKG

Detector # 2 Background Q.C. Analysis for 01/09/2009 14:54:37

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
10	50-> 150 keV Bkg	24.209	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	20.542	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	29.847	N.A.	Pass	N.A.
13	500->1000 keV Bkg	31.301	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	17.788	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	2.975	N.A.	Pass	N.A.

Q.C. Results Saved.



SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Weekly Background Check

Sample ID: 090109-3 WEEKLY BKG

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Sampling Start:   01/09/2009 14:00:00 | Counting Start:   01/09/2009 14:54:41
Sampling Stop:    01/09/2009 14:00:00 | Decay Time. . . . . 9.11E-001 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 60000 Sec
Sample Size . . . . . 1.00E+000 L | Real Time . . . . . 60119 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090054D03.SPC
-----

```

Detector #: 3 (Detector 3)

Energy(keV) = -1.25 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/09/2009

FWHM(keV) = 1.02 + 0.003*En + 7.23E-04*En^2 + 0.00E+00*En^3 02/29/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

```

=====
PEAK SEARCH RESULTS
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```

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.56	129.40	97	63	49	531	0.70	a
2	66.46	135.19	195	85	66	796	1.00	b
3	70.82	143.90	60	81	66	796	0.93	c NET< CL
4	77.20	156.63	132	82	65	776	0.98	a
5	92.70	187.60	367	90	67	772	1.18	a
6	140.00	282.04	103	65	51	518	0.81	a
7	185.79	373.46	254	74	55	632	1.03	a
8	198.31	398.46	150	76	59	685	1.14	a
9	209.35	420.51	35	49	39	381	0.61	a NET< CL
10	238.67	479.04	322	78	57	605	1.28	a
11	241.78	485.25	69	65	52	529	1.16	b
12	247.66	497.00	68	52	41	378	0.89	c
13	295.49	592.51	92	64	50	494	1.10	a
14	338.41	678.20	55	48	37	319	0.80	a
15	352.04	705.43	194	74	56	548	1.40	a
16	438.51	878.07	17	34	27	185	0.70	a NET< CL
17	511.11	1023.04	1489	121	76	691	2.74	a Wide Pk
18	537.96	1076.65	39	36	28	179	0.81	a
19	558.69	1118.04	132	53	39	288	1.31	a
20	569.70	1140.02	90	47	35	271	1.13	a
21	583.31	1167.20	151	70	54	448	2.26	a
22	596.27	1193.08	42	44	35	283	0.91	a
23	609.51	1219.52	131	57	43	386	1.37	a
24	669.96	1340.22	44	31	23	136	0.80	a

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	803.60	1607.06	94	41	30	173	1.43	a
26	899.14	1797.83	49	41	32	179	1.72	a
27	911.43	1822.38	57	36	27	148	1.30	a
28	1461.24	2920.19	157	43	29	140	2.44	a

090054D03.SPC Analyzed by

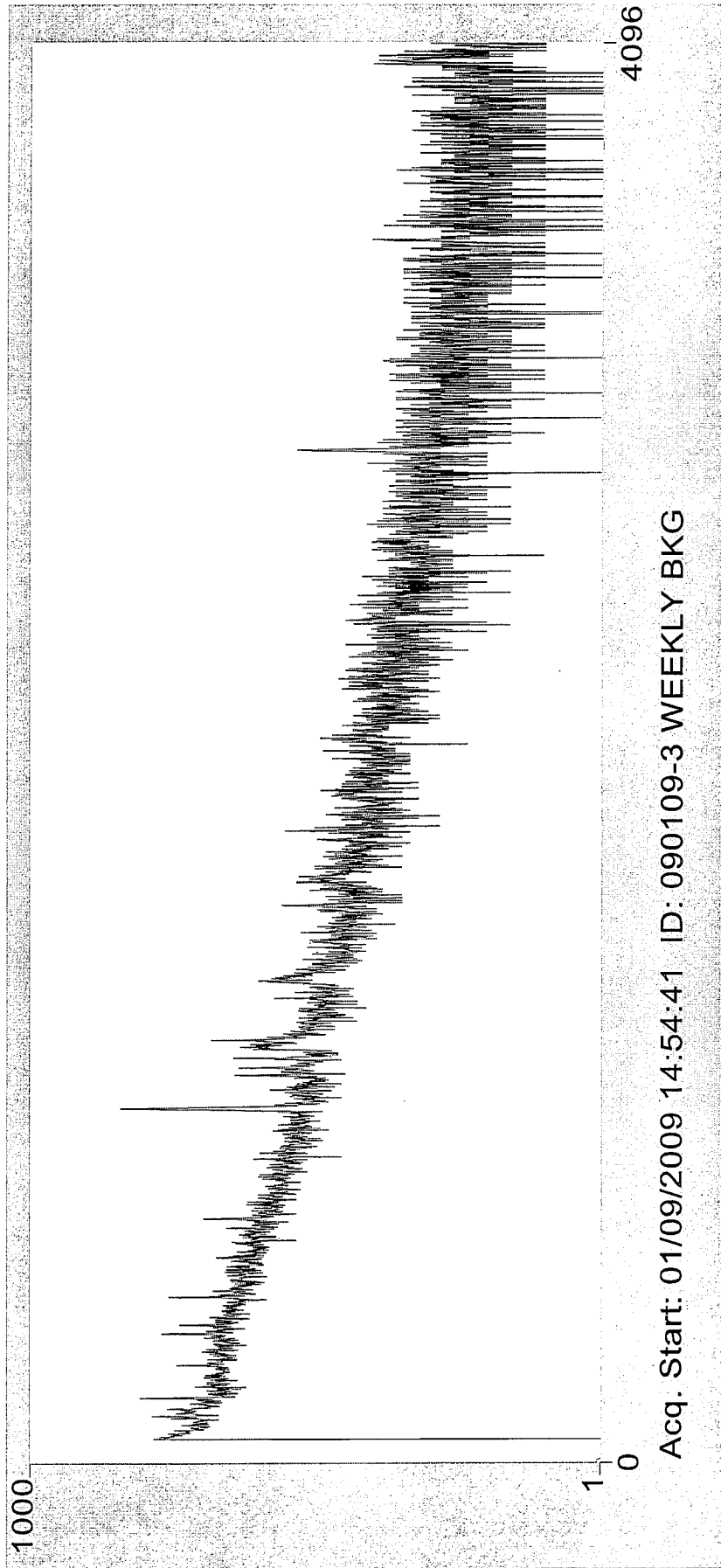
SEEKER B A C K G R O U N D Q . C . A N A L Y S I S Version 2.2.2

ID: 090109-3 WEEKLY BKG

Detector # 3 Background Q.C. Analysis for 01/09/2009 14:54:41

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
10	50-> 150 keV Bkg	23.246	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	19.036	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	28.165	N.A.	Pass	N.A.
13	500->1000 keV Bkg	29.308	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	16.616	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	3.105	N.A.	Pass	N.A.

Q.C. Results Saved.



Acq. Start: 01/09/2009 14:54:41 ID: 090109-3 WEEKLY BKG

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Weekly Background Check

Sample ID: 090109-6 WEEKLY BKG

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Sampling Start:    01/09/2009 14:00:00 | Counting Start:    01/09/2009 14:54:48
Sampling Stop:    01/09/2009 14:00:00 | Decay Time. . . . . 9.13E-001 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 60000 Sec
Sample Size . . . . . 1.00E+000 L | Real Time . . . . . 60045 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090070D06.SPC
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Detector #: 6 (Detector 6)

Energy(keV) = -0.48 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/09/2009

FWHM(keV) = 0.73 + 0.012*En + 6.10E-04*En^2 + 0.00E+00*En^3 07/25/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	54.07	109.03	47	85	69	877	0.96 a	NET< CL
2	66.54	133.95	113	80	63	803	0.77 a	
3	69.24	139.35	32	55	44	482	0.44 b	NET< CL
4	75.08	151.02	80	75	60	731	0.87 a	
5	84.89	170.62	25	58	47	498	0.70 a	NET< CL
6	87.58	176.00	21	48	39	374	0.45 b	NET< CL
7	92.69	186.21	189	89	69	819	1.18 a	
8	139.84	280.43	80	80	64	764	1.04 a	
9	159.15	319.03	47	48	38	355	0.49 a	
10	164.50	329.72	45	67	54	583	0.74 a	NET< CL
11	185.78	372.25	64	49	38	362	0.51 a	
12	198.57	397.82	221	85	66	737	1.07 a	
13	238.72	478.05	144	66	50	513	0.85 a	
14	277.21	554.98	37	49	39	335	0.68 a	NET< CL
15	295.28	591.10	81	80	64	653	1.37 a	
16	321.61	643.71	32	45	36	287	0.57 a	NET< CL
17	351.98	704.42	113	63	49	469	1.21 a	
18	396.44	793.26	42	44	34	266	0.83 a	
19	418.30	836.97	32	38	30	216	0.62 a	
20	511.19	1022.60	1306	116	75	726	2.39 a	Wide Pk
21	558.76	1117.67	160	46	32	218	1.03 a	
22	609.65	1219.38	117	50	37	284	1.03 a	
23	651.25	1302.51	30	30	23	128	0.72 a	
24	670.03	1340.04	48	42	32	207	1.22 a	

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	694.16	1388.29	81	86	69	586	2.61	a Wide Pk
26	803.50	1606.80	147	44	30	177	1.41	a
27	898.75	1797.15	65	53	42	267	2.33	a
28	911.79	1823.22	52	31	22	115	1.04	a
29	962.36	1924.29	85	37	27	138	1.48	a
30	1120.99	2241.31	30	32	25	130	1.30	a
31	1461.54	2921.93	320	45	22	92	1.83	a
32	1765.57	3529.55	51	25	17	55	1.57	a

090070D06.SPC Analyzed by

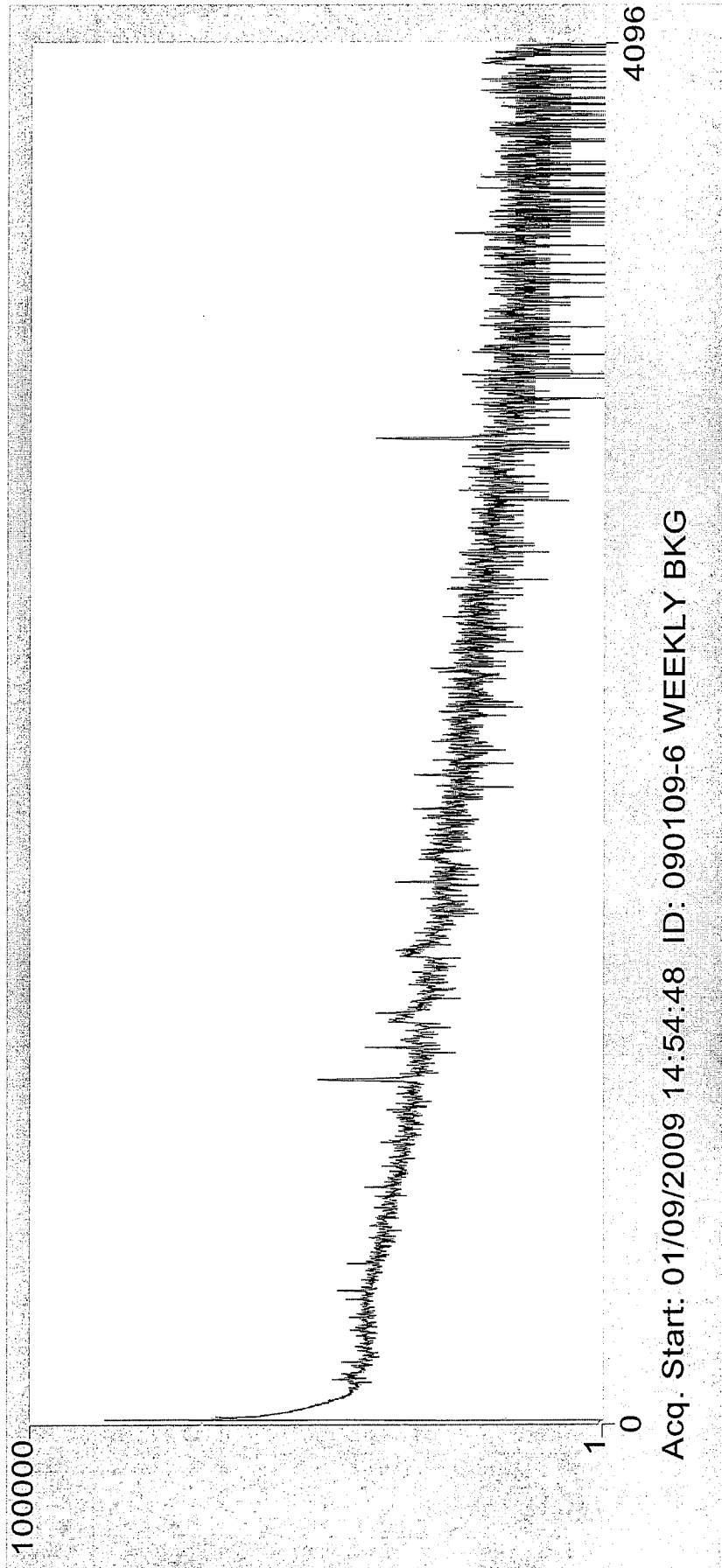
SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

ID: 090109-6 WEEKLY BKG

Detector # 6 Background Q.C. Analysis for 01/09/2009 14:54:48

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
10	50-> 150 keV Bkg	25.752	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	22.078	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	31.996	N.A.	Pass	N.A.
13	500->1000 keV Bkg	30.987	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	17.014	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	3.525	N.A.	Pass	N.A.

Q.C. Results Saved.



SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Weekly Background Check

Sample ID: 090109-8 WEEKLY BKG

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Sampling Start:    01/09/2009 14:00:00 | Counting Start:    01/09/2009 14:54:56
Sampling Stop:    01/09/2009 14:00:00 | Decay Time. . . . . 9.16E-001 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 60000 Sec
Sample Size . . . . . 1.00E+000 L | Real Time . . . . . 60087 Sec
Collection Efficiency . . . . 1.0000 | Spc. File . . . . . 090010D08.SPC
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Detector #: 8 (Detector 8)

Energy(keV) = -1.57 + 0.500*Ch + 1.76E-07*Ch^2 + 0.00E+00*Ch^3 01/07/2009

FWHM(keV) = 0.59 + 0.013*En + 6.62E-04*En^2 + 0.00E+00*En^3 06/13/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.42	95.96	415	74	51	579	0.71	a
2	53.35	109.83	49	62	50	545	0.72	a NET< CL
3	63.17	129.45	456	77	53	623	0.63	a HiResid
4	66.31	135.73	253	92	71	934	1.00	b HiResid
5	68.94	140.98	1	41	34	311	0.37	c NET< CL HiResid
6	74.87	152.84	279	84	63	805	0.85	a
7	77.10	157.31	199	71	54	644	0.68	b
8	84.39	171.87	249	105	82	1077	1.26	a Wide Pk
9	87.24	177.57	91	53	40	404	0.51	b
10	92.58	188.25	880	98	64	755	0.93	a
11	98.27	199.63	47	38	29	231	0.40	a
12	112.68	228.44	66	39	29	240	0.40	a
13	139.74	282.52	143	79	62	700	0.99	a
14	143.62	290.28	79	68	54	583	0.77	b
15	174.78	352.58	50	45	36	311	0.49	a
16	185.70	374.41	368	74	52	551	0.90	a
17	198.29	399.58	231	77	58	622	0.96	a
18	238.56	480.07	308	71	50	511	0.78	a
19	242.17	487.29	39	45	35	307	0.47	b
20	259.43	521.79	32	57	46	433	0.79	a NET< CL
21	295.11	593.10	50	66	53	512	0.90	a NET< CL
22	311.29	625.44	32	60	49	440	1.05	a NET< CL
23	316.03	634.91	36	46	36	293	0.65	b NET< CL

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	327.93	658.69	7	36	30	216	0.52	a NET< CL
25	341.40	685.61	29	38	30	228	0.53	a NET< CL
26	351.98	706.76	146	62	47	412	1.00	a
27	511.09	1024.71	1621	125	79	795	2.51	a Wide Pk
28	538.07	1078.62	35	33	25	156	0.71	a
29	558.52	1119.47	200	51	35	258	0.99	a
30	569.89	1142.18	69	53	41	333	1.11	a
31	583.25	1168.88	126	55	42	320	1.32	a
32	609.48	1221.28	96	53	41	350	1.04	a
33	651.36	1304.95	49	41	32	214	0.92	a
34	694.17	1390.46	187	100	79	718	2.99	a Wide Pk
35	803.13	1608.11	156	46	32	189	1.25	a
36	898.70	1798.96	63	54	43	295	2.09	a
37	911.87	1825.28	48	51	40	274	1.89	a
38	962.36	1926.09	39	31	23	124	0.92	a
39	969.35	1940.06	38	31	23	124	0.95	b
40	1000.96	2003.17	45	40	31	177	1.66	a
41	1014.87	2030.93	38	38	29	167	1.42	a
42	1115.31	2231.47	9	56	46	291	2.71	a NET< CL Wide Pk
43	1461.11	2921.66	207	43	27	127	2.16	a

090010D08.SPC Analyzed by

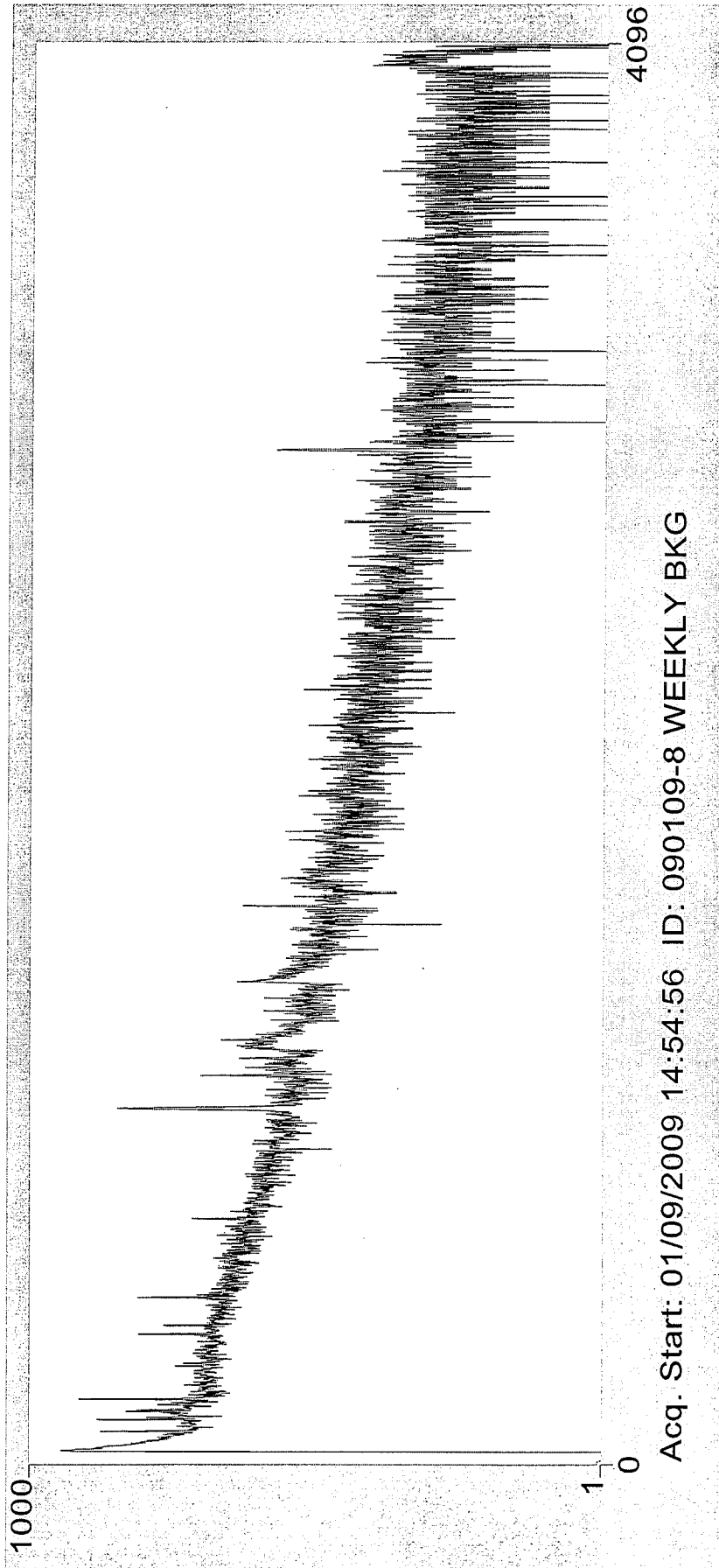
SEEKER B A C K G R O U N D Q . C . A N A L Y S I S Version 2.2.2

ID: 090109-8 WEEKLY BKG

Detector # 8 Background Q.C. Analysis for 01/09/2009 14:54:56

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
10	50-> 150 keV Bkg	28.420	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	21.861	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	32.822	N.A.	Pass	N.A.
13	500->1000 keV Bkg	35.023	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	20.502	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	3.612	N.A.	Pass	N.A.

Q.C. Results Saved.



SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab

GammaScan

Weekly Background Check

Sample ID: 090109-9 WEEKLY BKG

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Sampling Start:    01/09/2009 14:00:00 | Counting Start:    01/09/2009 14:55:00
Sampling Stop:    01/09/2009 14:00:00 | Decay Time. . . . . 9.17E-001 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 60000 Sec
Sample Size . . . . . 1.00E+000 L | Real Time . . . . . 60045 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 090047D09.SPC
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Detector #: 9 (Detector 9)

Energy(keV)= 1.25 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/09/2009

FWHM(keV) = 0.46 + 0.026*En + 4.17E-04*En^2 + 0.00E+00*En^3 01/14/2008

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.54	90.66	451	82	58	676	0.78	a
2	53.29	104.16	67	73	58	683	0.84	a
3	63.29	124.18	373	72	50	555	0.65	a
4	66.43	130.47	171	76	59	694	0.88	b
5	74.92	147.46	129	47	34	322	0.38	a
6	77.12	151.86	107	69	54	644	0.63	b
7	84.77	167.17	95	70	56	626	0.84	a
8	87.20	172.04	70	70	56	626	0.82	b
9	92.66	182.96	566	80	53	572	0.87	a
10	139.96	277.64	137	83	65	730	1.09	a
11	144.19	286.12	63	64	51	522	0.85	b
12	159.62	317.00	8	43	35	310	0.43	a NET< CL
13	163.00	323.76	51	72	58	620	1.06	b NET< CL
14	185.86	369.51	206	51	35	296	0.56	a
15	198.47	394.77	121	63	48	472	0.88	a
16	238.79	475.47	214	50	33	270	0.53	a
17	264.47	526.87	27	47	38	313	0.59	a NET< CL
18	295.41	588.79	81	61	48	432	0.90	a
19	338.31	674.68	47	43	33	247	0.66	a
20	351.93	701.93	71	50	39	308	0.74	a
21	367.27	732.63	37	53	43	335	1.03	a NET< CL
22	511.12	1020.57	1160	109	70	660	2.33	a Wide Pk
23	514.08	1026.50	30	35	28	189	0.64	b
24	558.37	1115.16	200	55	39	278	1.25	a

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
25	569.80	1138.02	59	39	30	204	0.85	a
26	583.19	1164.84	55	36	27	171	0.82	a
27	609.51	1217.52	100	52	40	310	1.07	a
28	803.12	1605.06	112	42	30	186	1.35	a
29	899.26	1797.50	53	58	46	289	2.77	a Wide Pk
30	911.62	1822.22	43	46	37	215	2.18	a
31	1460.96	2921.81	105	33	22	93	1.55	a

090047D09.SPC Analyzed by

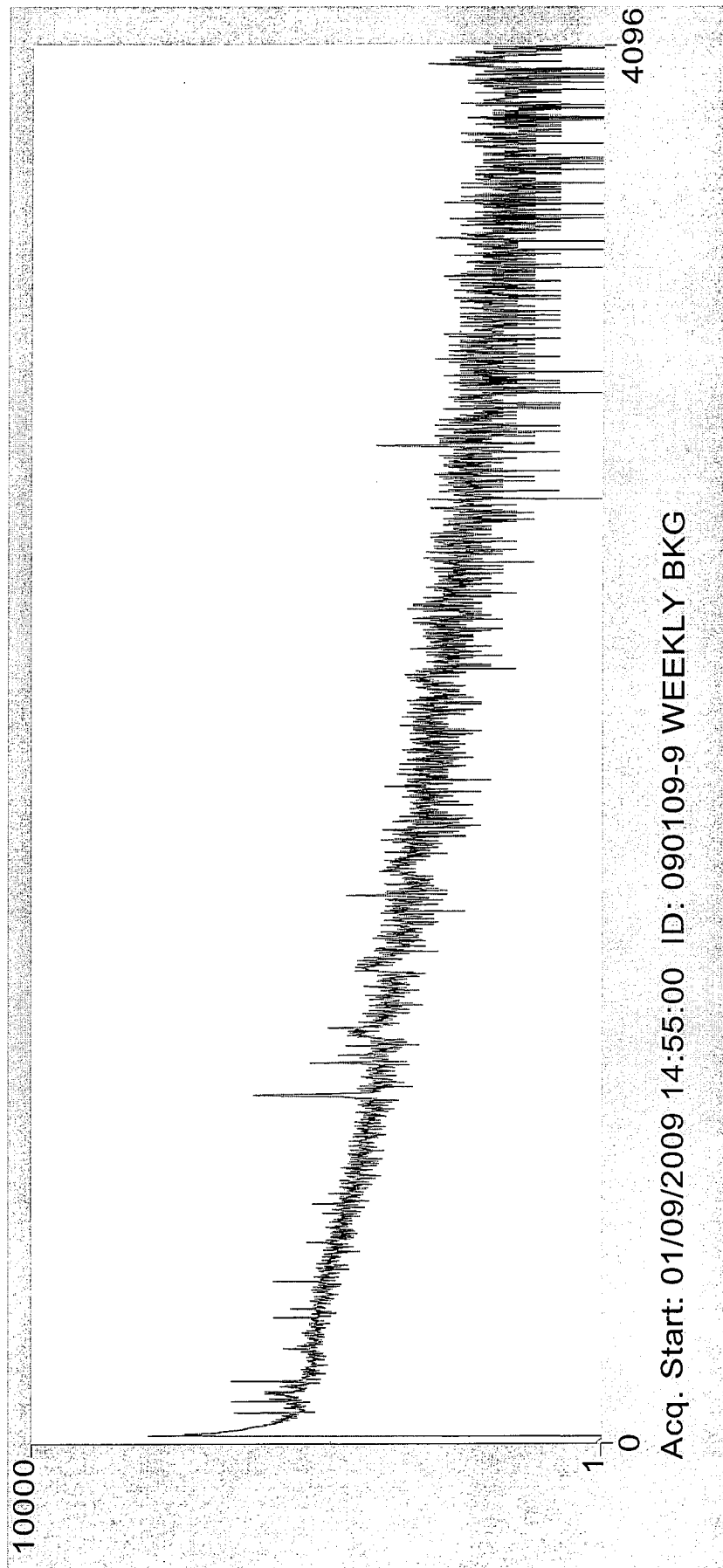
SEEKER B A C K G R O U N D Q. C. A N A L Y S I S Version 2.2.2

ID: 090109-9 WEEKLY BKG

Detector # 9 Background Q.C. Analysis for 01/09/2009 14:55:00

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
10	50-> 150 keV Bkg	25.685	N.A.	Pass	N.A.
11	150-> 250 keV Bkg	19.300	N.A.	Pass	N.A.
12	250-> 500 keV Bkg	28.717	N.A.	Pass	N.A.
13	500->1000 keV Bkg	29.189	N.A.	Pass	N.A.
14	1000->2000 keV Bkg	16.869	N.A.	Pass	N.A.
15	40-> 50 keV Bkg	3.445	N.A.	Pass	N.A.

Q.C. Results Saved.





Gamma Spectroscopy

Quality Control Data

Daily Instrument Performance Checks

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

PAI 0720

66354A-307

215 Grams of Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytix maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

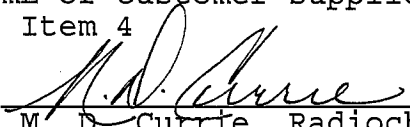
Calibration date: July 1, 2003 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1316	3.0
Cd-109	88	462.6 d	1879	3.3
Co-57	122	271.79 d	1042	2.8
Ce-139	166	137.6 d	1432	2.8
Hg-203	279	46.61 d	3223	2.7
Sn-113	392	115.1 d	1978	2.6
Cs-137	662	30.07 y	1272	3.0
Y-88	898	106.6 d	5106	2.6
Co-60	1173	5.2714 y	2424	2.7
Co-60	1332	5.2714 y	2449	2.6
Y-88	1836	106.6 d	5335	2.6

Approximately 126.5 mL of customer supplied sand.

P O NUMBER EW060303, Item 4

SOURCE PREPARED BY:


M. D. Currie, Radiochemist

Q A APPROVED:

 8-1-03

This standard will expire one year after the calibration date.



RSO # 767
Rec'd 8/13/04
JOS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 • U.S.A.

Phone (404) 352-8677

Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

68681-307

215 Grams of Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytical maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2004 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1355	3.0
Cd-109	88	462.6 d	1900	3.3
Co-57	122	271.79 d	995.1	3.0
Ce-139	166	137.6 d	1411	2.8
Hg-203	279	46.61 d	3241	2.7
Sn-113	392	115.1 d	1939	2.6
Cs-137	662	30.07 y	1247	3.0
Y-88	898	106.6 d	4853	2.6
Co-60	1173	5.2714 y	2457	2.7
Co-60	1332	5.2714 y	2474	2.6
Y-88	1836	106.6 d	5064	2.6

140 mL of customer supplied sand.

P O NUMBER 70564, Item 4

SOURCE PREPARED BY:

M. D. Currie for
M. D. Currie, Radiochemist

Q A APPROVED:

M. D. Currie 8-9-04

This standard will expire one year after the calibration date.

$\approx 203 \mu\text{Ci}$

PAT 50 0636
recd 8-02-02
CERTIFICATE OF CALIBRATION**Standard Radionuclide Source**

64122-307

215 Grams of Sand in Metal Can

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytix maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: July 1, 2002 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 y	1301	5.0
Cd-109	88	462.6 d	1882	5.0
Co-57	122	271.79 d	994.2	4.7
Ce-139	166	137.6 d	1420	4.3
Hg-203	279	46.61 d	3085	4.1
Sn-113	392	115.1 d	2094	4.1
Cs-137	662	30.07 y	1320	4.8
Y-88	898	106.6 d	4847	4.2
Co-60	1173	5.2714 y	2354	4.1
Co-60	1332	5.2714 y	2382	4.2
Y-88	1836	106.6 d	5068	4.0

Approximately 140 mL customer supplied sand.
P O NUMBER EW060602, Item 4

SOURCE PREPARED BY: M. Taskaeva
M. Taskaeva Radiochemist

Q A APPROVED: Recd 7/31/02

This standard will expire one year after the calibration date.

RSO # 720 was opened and split into multiple LSC vials, as shown

720.3020.47	-1	35.8071 g	(Bal 12)
	-2	36.1586	
	-3	36.1325	
	-4	36.0040	
	-5	36.4197	
	-6	34.5663	

These will be used as δ daily check sources

[Signature]
10/30/06

Continued on Page

Read and Understood By

[Signature]

10/30/06

Signed

Date

Signed

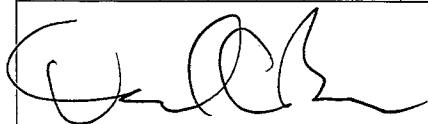
RSO #767 was opened and split into multiple LSC vials, to be used as 8 check sources, as shown

767.3020.48-7	36.6640 g	(Bal 12)
8	36.1856 g	
9	36.3376 g	
10	35.9931 g	
11	36.7952 g	
12	33.1100 g	

JSB
10/30/06

Continued on Page _____

Read and Understood By



Signed

10/30/06

Date

387 of 412

Signed

Date

RSO # 636 was opened and split into multiple LSC vials, to be used as 8 daily check sources, as shown


636.3020.49-13	34.2237 g	(Bal 12)
↓ 14	33.7917 g	↓
15	34.6628	
16	34.1622	
17	34.2401	
18	34.6838	

The remaining 9.1386g was transferred to a 200 ml plastic beaker and marked for disposal.

~~6/30/06~~

Continued on Page

Read and Understood By



Signed

10/30/06

Date

Signed

388 of 412

ALS - Fort Collins

Gamma Spectrometer Calibration Log

Date: 1-12-09

Reviewed By/Date: mtv 1-12-09

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.	<i>mtv</i>			<i>/</i>	<i>/</i>					
2.				<i>mtv</i>	<i>mtv</i>					
3.				<i>↓</i>	<i>↓</i>					
4.				<i>↓</i>	<i>↓</i>					
5.	<i>mtv</i>			<i>/</i>	<i>/</i>					
6.				<i>mtv</i>	<i>mtv</i>					
7.				<i>↓</i>	<i>↓</i>					
8.				<i>↓</i>	<i>↓</i>					
9.				<i>↓</i>	<i>↓</i>					
10.	<i>mtv</i>			<i>/</i>	<i>/</i>					

** Corrective Action: 0 Det # 4. Daily check Interim Control limits are set.
mtv 1-12-09
 weekly background interim control limits are set.
mtv 1-12-09

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 3 Detector Q.C. Analysis for 01/12/2009 08:51:10

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	121.222	N.A.	Pass	N.A.
2	60 keV FWHM	1.029	N.A.	Pass	N.A.
3	60 keV Efficiency	1.060E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.447	N.A.	Pass	N.A.
5	662 keV FWHM	1.758	N.A.	Pass	N.A.
6	662 keV Efficiency	1.622E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2662.397	N.A.	Pass	N.A.
8	1332 keV FWHM	2.444	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.689E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 6 Detector Q.C. Analysis for 01/12/2009 08:51:28

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	119.838	N.A.	Pass	N.A.
2	60 keV FWHM	7.951E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	8.772E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1323.039	N.A.	Pass	N.A.
5	662 keV FWHM	1.429	N.A.	Pass	N.A.
6	662 keV Efficiency	2.701E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.689	N.A.	Pass	N.A.
8	1332 keV FWHM	2.013	N.A.	Pass	N.A.
9	1332 keV Efficiency	3.461E-02	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 8 Detector Q.C. Analysis for 01/12/2009 08:51:47

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	121.843	N.A.	Pass	N.A.
2	60 keV FWHM	7.130E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	8.781E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1325.421	N.A.	Pass	N.A.
5	662 keV FWHM	1.341	N.A.	Pass	N.A.
6	662 keV Efficiency	2.974E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.007	N.A.	Pass	N.A.
8	1332 keV FWHM	1.968	N.A.	Pass	N.A.
9	1332 keV Efficiency	4.564E-02	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 9 Detector Q.C. Analysis for 01/12/2009 08:51:55

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	116.577	N.A.	Pass	N.A.
2	60 keV FWHM	7.202E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.251E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1321.912	N.A.	Pass	N.A.
5	662 keV FWHM	1.321	N.A.	Pass	N.A.
6	662 keV Efficiency	1.343E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2664.624	N.A.	Pass	N.A.
8	1332 keV FWHM	1.962	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.003E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

ALS - Fort Collins

Gamma Spectrometer Calibration Log

Date: 1-13-09

Reviewed By/Date: WJ 1-13-09

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.	WJ			/	/					
2.				WJ	WJ					
3.				↓	↓					
4.				↓	↓					
5.	WJ			/	/					
6.				WJ	WJ					
7.				WJ	WJ					
8.				↓	/	1332 Kev FWHM	WJ			
9.				↓	WJ					
10.	WJ			/	/					

** Corrective Action:

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 3 Detector Q.C. Analysis for 01/13/2009 07:25:30

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	121.408	N.A.	Pass	N.A.
2	60 keV FWHM	1.071	N.A.	Pass	N.A.
3	60 keV Efficiency	1.050E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.816	N.A.	Pass	N.A.
5	662 keV FWHM	1.754	N.A.	Pass	N.A.
6	662 keV Efficiency	1.644E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.213	N.A.	Pass	N.A.
8	1332 keV FWHM	2.426	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.324E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 6 Detector Q.C. Analysis for 01/13/2009 09:54:17

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	120.068	N.A.	Pass	N.A.
2	60 keV FWHM	8.627E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	9.603E-03	N.A.	Pass	N.A.
4	662 keV Centroid	1323.823	N.A.	Pass	N.A.
5	662 keV FWHM	1.427	N.A.	Pass	N.A.
6	662 keV Efficiency	2.681E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.066	N.A.	Pass	N.A.
8	1332 keV FWHM	1.947	N.A.	Pass	N.A.
9	1332 keV Efficiency	4.079E-02	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 8 Detector Q.C. Analysis for 01/13/2009 07:26:03

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	122.154	N.A.	Pass	N.A.
2	60 keV FWHM	7.220E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	9.116E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1325.727	N.A.	Pass	N.A.
5	662 keV FWHM	1.311	N.A.	Pass	N.A.
6	662 keV Efficiency	3.186E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.376	N.A.	Pass	N.A.
8	1332 keV FWHM	2.050	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	4.663E-02	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 8 Detector Q.C. Analysis for 01/13/2009 07:40:50

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	122.173	N.A.	Pass	N.A.
2	60 keV FWHM	7.217E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	9.185E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1325.782	N.A.	Pass	N.A.
5	662 keV FWHM	1.377	N.A.	Pass	N.A.
6	662 keV Efficiency	3.072E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.478	N.A.	Pass	N.A.
8	1332 keV FWHM	1.929	N.A.	Pass	N.A.
9	1332 keV Efficiency	4.675E-02	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 9 Detector Q.C. Analysis for 01/13/2009 07:26:12

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	116.709	N.A.	Pass	N.A.
2	60 keV FWHM	7.139E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.121E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1322.148	N.A.	Pass	N.A.
5	662 keV FWHM	1.306	N.A.	Pass	N.A.
6	662 keV Efficiency	1.345E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.049	N.A.	Pass	N.A.
8	1332 keV FWHM	1.919	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.035E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

ALS - Fort Collins

Gamma Spectrometer Calibration Log

Date: 1-14-09

Reviewed By/Date: MSV 1-14-09

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.	<i>MSV</i>			<i>/</i>	<i>/</i>					
2.				<i>MSV</i>	<i>MSV</i>					
3.				<i>↓</i>	<i>↓</i>					
4.				<i>↓</i>	<i>↓</i>					
5.	<i>MSV</i>			<i>/</i>	<i>/</i>					
6.				<i>MSV</i>	<i>MSV</i>					
7.				<i>MSV</i>	<i>MSV</i>					
8.				<i>↓</i>	<i>↓</i>					
9.				<i>↓</i>	<i>↓</i>					
10.	<i>MSV</i>			<i>/</i>	<i>/</i>					

** Corrective Action:

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 3 Detector Q.C. Analysis for 01/14/2009 07:47:43

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	121.376	N.A.	Pass	N.A.
2	60 keV FWHM	9.740E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.047E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.906	N.A.	Pass	N.A.
5	662 keV FWHM	1.723	N.A.	Pass	N.A.
6	662 keV Efficiency	1.658E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.506	N.A.	Pass	N.A.
8	1332 keV FWHM	2.374	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.554E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 8 Detector Q.C. Analysis for 01/14/2009 07:48:13

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	122.124	N.A.	Pass	N.A.
2	60 keV FWHM	7.190E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	9.322E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1325.811	N.A.	Pass	N.A.
5	662 keV FWHM	1.323	N.A.	Pass	N.A.
6	662 keV Efficiency	3.140E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.661	N.A.	Pass	N.A.
8	1332 keV FWHM	1.893	N.A.	Pass	N.A.
9	1332 keV Efficiency	4.695E-02	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 9 Detector Q.C. Analysis for 01/14/2009 07:48:23

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	116.692	N.A.	Pass	N.A.
2	60 keV FWHM	7.178E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	5.330E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1322.135	N.A.	Pass	N.A.
5	662 keV FWHM	1.328	N.A.	Pass	N.A.
6	662 keV Efficiency	1.332E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2665.046	N.A.	Pass	N.A.
8	1332 keV FWHM	1.835	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.145E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

ALS - Fort Collins

Gamma Spectrometer Calibration Log

Date: 1-15-09

Reviewed By/Date: WAC 1-15-09

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.	<i>WAC</i>			<i>/</i>	<i>/</i>					
2.				<i>WAC</i>	<i>WAC</i>					
3.				<i>↓</i>	<i>↓</i>					
4.				<i>↓</i>	<i>↓</i>					
5.	<i>WAC</i>			<i>/</i>	<i>/</i>					
6.				<i>WAC</i>	<i>WAC</i>					
7.				<i>↓</i>	<i>↓</i>					
8.				<i>↓</i>	<i>↓</i>					
9.				<i>WAC</i>	<i>WAC</i>					
10.	<i>WAC</i>			<i>/</i>	<i>/</i>					

** Corrective Action:

371750 ^{12/02/08}
371750 A _{gtt}

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 2 Detector Q.C. Analysis for 01/15/2009 07:14:26

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	120.146	N.A.	Pass	N.A.
2	60 keV FWHM	7.972E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.204E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.438	N.A.	Pass	N.A.
5	662 keV FWHM	1.688	N.A.	Pass	N.A.
6	662 keV Efficiency	1.788E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2664.068	N.A.	Pass	N.A.
8	1332 keV FWHM	2.540	N.A.	Pass	N.A.
9	1332 keV Efficiency	8.123E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q. C. A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 3 Detector Q.C. Analysis for 01/15/2009 07:14:38

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	121.352	N.A.	Pass	N.A.
2	60 keV FWHM	9.837E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.055E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.631	N.A.	Pass	N.A.
5	662 keV FWHM	1.678	N.A.	Pass	N.A.
6	662 keV Efficiency	1.574E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2662.928	N.A.	Pass	N.A.
8	1332 keV FWHM	2.513	N.A.	Pass	N.A.
9	1332 keV Efficiency	7.650E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 8 Detector Q.C. Analysis for 01/15/2009 08:11:59

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	122.196	N.A.	Pass	N.A.
2	60 keV FWHM	7.300E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	9.113E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1326.066	N.A.	Pass	N.A.
5	662 keV FWHM	1.358	N.A.	Pass	N.A.
6	662 keV Efficiency	2.969E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2666.177	N.A.	Pass	N.A.
8	1332 keV FWHM	1.833	N.A.	Pass	N.A.
9	1332 keV Efficiency	4.671E-02	N.A.	Pass	N.A.

Q.C. Results Saved.

ALS - Fort Collins

Gamma Spectrometer Calibration Log

Date: 1-16-09

Reviewed By/Date: WAV 1-16-09

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.	WAV	/	/	/	/					
2.				WAV	WAV					
3.				↓	↓					
4.				↓	↓					
5.	WAV	/	/	/	/					
6.				WAV	WAV					
7.				↓	/	1332 KeV Efficiency	WAV			
8.				↓	/	1332 KeV FWHM	↓			
9.				↓	WAV					
10.	WAV	/	/	/	/					

** Corrective Action:

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 2 Detector Q.C. Analysis for 01/16/2009 14:12:00

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	120.162	N.A.	Pass	N.A.
2	60 keV FWHM	8.043E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	1.167E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.426	N.A.	Pass	N.A.
5	662 keV FWHM	1.693	N.A.	Pass	N.A.
6	662 keV Efficiency	1.824E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.746	N.A.	Pass	N.A.
8	1332 keV FWHM	2.625	N.A.	Pass	N.A.
9	1332 keV Efficiency	8.344E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 3 Detector Q.C. Analysis for 01/16/2009 14:12:11

Standards File #: 97 (Daily Performance Check(S SOURCES 1-12))

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	121.389	N.A.	Pass	N.A.
2	60 keV FWHM	1.026	N.A.	Pass	N.A.
3	60 keV Efficiency	1.084E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1323.687	N.A.	Pass	N.A.
5	662 keV FWHM	1.692	N.A.	Pass	N.A.
6	662 keV Efficiency	1.591E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2663.004	N.A.	Pass	N.A.
8	1332 keV FWHM	2.593	N.A.	Pass	N.A.
9	1332 keV Efficiency	8.035E-03	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 8 Detector Q.C. Analysis for 01/16/2009 16:40:29

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	122.217	N.A.	Pass	N.A.
2	60 keV FWHM	7.475E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	9.247E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1326.176	N.A.	Pass	N.A.
5	662 keV FWHM	1.316	N.A.	Pass	N.A.
6	662 keV Efficiency	3.052E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2666.332	N.A.	Pass	N.A.
8	1332 keV FWHM	1.992	N.A.	<FAIL>	N.A.
9	1332 keV Efficiency	4.870E-02	N.A.	Pass	N.A.

Q.C. Results Saved.

SEEKER D E T E C T O R Q . C . A N A L Y S I S Version 2.2.2

ID: DAILY CHECK

Detector # 8 Detector Q.C. Analysis for 01/16/2009 16:51:40

Standards File #: 98 (Daily Performance Check)

#	Parameter	Value	n Sigma Test	Bounds Test	T- Test
1	60 keV Centroid	122.195	N.A.	Pass	N.A.
2	60 keV FWHM	7.407E-01	N.A.	Pass	N.A.
3	60 keV Efficiency	9.469E-02	N.A.	Pass	N.A.
4	662 keV Centroid	1326.141	N.A.	Pass	N.A.
5	662 keV FWHM	1.375	N.A.	Pass	N.A.
6	662 keV Efficiency	3.117E-02	N.A.	Pass	N.A.
7	1332 keV Centroid	2666.340	N.A.	Pass	N.A.
8	1332 keV FWHM	1.914	N.A.	Pass	N.A.
9	1332 keV Efficiency	4.716E-02	N.A.	Pass	N.A.

Q.C. Results Saved.



RESUBMISSION

Isotopic Uranium

Case Narrative

Freeport McMoRan Sierrita

FMI-VRP

Work Order Number: 0812177

1. This report consists of the analytical results and supporting documentation for 20 soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared according to procedures SOP336R0, SOP773R10, and SOP778R12. Due to possible matrix interference, all samples were prepared at a reduced aliquot of ~1 g. Due to high activity detected in the prescreen, samples 0812177-8, -10, -11, -12, and -14 were prepared at a reduced aliquot of ~0.5 g and ~0.25 g for samples -13 and -20.
3. The samples were analyzed for the presence of isotopic uranium according to procedure SOP714R11. The analyses were completed on 02/10/09.
4. The isotopic analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
5. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy region. An 85.1% abundance correction has been made to the final U-235 results.
6. The requested MDC of 0.1 pCi/gram was not met for U-234 and U-238 for several samples. The reported activity for these samples is greater than the achieved MDC. These samples are identified with an "M3" flag on the final reports.
7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jean Anderson

Jean Anderson

Radiochemistry Primary Data Reviewer

12/03/12

Date

Michael J. L.

Radiochemistry Final Data Reviewer

12-3-12

Date



Section 1

CHAIN OF CUSTODY

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812177

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-SD-01-0-1.5	0812177-1		SOIL	16-Jul-08	8:30
CP-SD-01-1.5-3.0	0812177-2		SOIL	16-Jul-08	8:30
CP-SD-02-0-1.5	0812177-3		SOIL	16-Jul-08	9:08
CP-SD-02-1.5-3.0	0812177-4		SOIL	16-Jul-08	9:08
CP-SD-06-0-1.5	0812177-5		SOIL	16-Jul-08	9:26
CP-SD-06-1.5-3.0	0812177-6		SOIL	16-Jul-08	9:26
CP-SD-05-0-1.5	0812177-7		SOIL	16-Jul-08	9:45
CP-SD-05-1.5-3.0	0812177-8		SOIL	16-Jul-08	9:45
CP-SD-03-0-1.5	0812177-9		SOIL	16-Jul-08	9:54
CP-SD-03-1.5-3.0	0812177-10		SOIL	16-Jul-08	9:54
CP-P07-1-3	0812177-11		SOIL	17-Jul-08	14:04
CP-P07-0-1	0812177-12		SOIL	17-Jul-08	14:04
CP-P07-5-7	0812177-13		SOIL	17-Jul-08	14:11
CP-SD-04-0-1.5	0812177-14		SOIL	17-Jul-08	14:52
CP-SD-04-1.5-3.0	0812177-15		SOIL	17-Jul-08	14:52
CP-Q09-1-3	0812177-16		SOIL	23-Jul-08	10:15
CP-SD-09-0-1.5	0812177-17		SOIL	28-Jul-08	10:39
CD-SD-09-1.5-3.0	0812177-18		SOIL	28-Jul-08	10:39
CP-P12-1-3	0812177-19		SOIL	23-Jul-08	11:03
OD-SD-02-0-1.5	0812177-20		SOIL	28-Jul-08	11:11



**PARAGON
ANALYTICS**

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Paragon

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 1 of 2

Project Name/No.: FMI-VIRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: Date 12/15/08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: Steven.Vaughn@paragoncorp.com

Company: Freeport Mc Moran

Address: Green Valley, AZ 85614

6200 W Duval Ave Rd.

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type... HCl, etc.)	No. of Containers	VOCS		BTEX (only)	SVOCs	OC Pesticides	PCBs	Herbicides	Explosives	TCLP Organics SW1311	TCLP Metals SW1311 Hg	Total Metals by ICP Hg	Dissolved Metals by ICP Hg	Total Metals by ICP/MS	Dissolved Metals by ICP/MS	Hexavalent Chromium	Inorganic Anions	Solids:	pH	TPH	Gross Alpha / Beta	Actinides by Paragon SOP	Tritium	Total Alpha-Emitting Radium	Radium 226	Radium 228	Strontium 90 (Total RadioSr)	Gamma Isotopes	Radon 222	Uranium Isotopes
CP-SD-01-0-1.5	7/16/08	830	①	S	n/a	1																													
CP-SD-01-1.5-3.0	7/16/08	830	②	S	n/a	1																													
CP-SD-02-0-1.5	7/16/08	908	③	S	n/a	1																													
CP-SD-02-1.5-3.0	7/16/08	908	④	S	n/a	1																													
CP-SD-06-0-1.5	7/16/08	926	⑤	S	n/a	1																													
CP-SD-06-1.5-3.0	7/16/08	926	⑥	S	n/a	1																													
CP-SD-05-0-1.5	7/16/08	945	⑦	S	n/a	1																													
CP-SD-05-1.5-3.0	7/16/08	945	⑧	S	n/a	1																													
CP-SD-03-0-1.5	7/16/08	954	⑨	S	n/a	1																													
CP-SD-03-1.5-3.0	7/16/08	954	⑩	S	n/a	1																													

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Order No. 0548 VT

Trk # 7971 87199884

Relinquished By: (1)
Signature: K. Walsh
Printed Name: Kevin Walsh
Date: 12/15/08 Time: 1600
Company: URS

Received By: (1)
Signature: Cheryl Trimble
Printed Name: Cheryl Trimble
Date: 12-17-08 Time: 1045
Company: ALS Paragon

Relinquished By: (2)
Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____

Received By: (2)
Signature: _____
Printed Name: _____
Date: _____ Time: _____
Company: _____



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 2 of 2

Project Name/No.: FMI-VRP		Sampler(s): K. Walsh		Turnaround (circle one): <u>Standard</u> or Rush (Due _____)		Dispose Date <u>60 day</u> or Return to Client _____	
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: E-mail: Steven.Vaughn@urscorp.com Company: Freepoint Mc Moran Address: 6200 W Duvall Ave Rd. Green Valley, AZ 85614							
Circle method (right); provide additional information as needed (comments).							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers	
CP-P07-1-3	7/17/08	1404	11	S	N/A	1	
CP-P07-0-1	7/17/08	1404	13	S	N/A	1	
CP-P07-5-7	7/17/08	1411	13	S	N/A	1	
CP-SD-04-0-1.5	7/17/08	1452	14	S	N/A	1	
CP-SD-04-1.5-3.0	7/17/08	1452	15	S	N/A	1	
CP-C09-1-3	7/23/08	1015	16	S	N/A	1	
CP-SD-09-0-1.5	7/23/08	1034	17	S	N/A	1	
CP-SD-09-1.5-3.0	7/23/08	1039	18	S	N/A	1	
CP-P12-1-3	7/23/08	1103	19	S	N/A	1	
OD-SD-02-0-1.5	7/23/08	1111	20	S	N/A	1	
* Time Zone: EST CST MST PST		Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter					
Comments:							
Order No. 0508VT							
Trk # 7971 87199884							
Relinquished By: <u>K. Walsh</u>		Signature _____		Printed Name _____		Date _____ Time _____	
(1)		Company _____		Company _____		Company _____	
Relinquished By: <u>Cheryl Trimble</u>		Signature _____		Printed Name _____		Date _____ Time _____	
(1)		Company _____		Company _____		Company _____	
Relinquished By: <u>Cheryl Trimble</u>		Signature _____		Printed Name _____		Date _____ Time _____	
(1)		Company _____		Company _____		Company _____	
Form 2026.xls (6/16/06)							

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812177Project Manager: JEInitials: COT Date: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> <u>#4</u>	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO / NA (If no. see Form 008.)		

DOT
Survey/
Acceptance
Information

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO ☒ NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE 12/20/08

*IR Gun #2: Oakton, SN 29922500201-0066

IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705

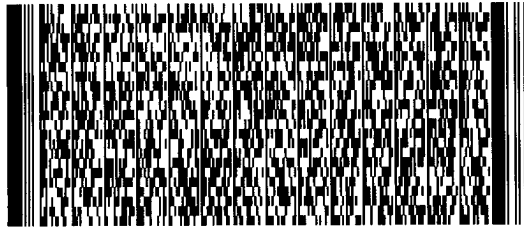


JCLS111208/20/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524



LL10180

1-71

Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #

4 of 4

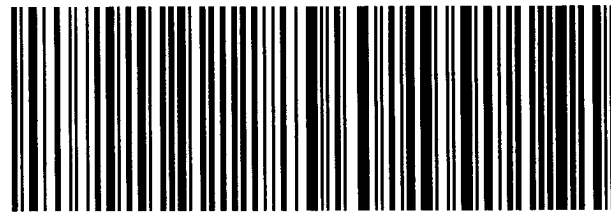
WED - 17DEC

AA

MPS# 7971 8719 9884
 0263

STANDARD OVERNIGHT

Mstr# 7971 8719 9690 0201

80524**CO-US****DEN****XH FTCA****After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



Section 2



SAMPLE RESULTS SUMMARY

Isotopic Uranium By Alpha Spectroscopy Sample Results Summary

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Laboratory Name: ALS Environmental -- FC

PAI Work Order: 0812177

Page: 1 of 7

Reported on: Monday, December 03, 2012

11:04:32 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-1	CP-SD-01-0-1.5	Sample	U-234	1.5 +/- 0.32	0.031	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-1	CP-SD-01-0-1.5	Sample	U-235	0.11 +/- 0.058	0.036	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-1	CP-SD-01-0-1.5	Sample	U-238	1.5 +/- 0.31	0.016	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-2	CP-SD-01-1.5-3.0	Sample	U-234	2.2 +/- 0.42	0.030	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-2	CP-SD-01-1.5-3.0	Sample	U-235	0.14 +/- 0.067	0.042	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-2	CP-SD-01-1.5-3.0	Sample	U-238	2.2 +/- 0.42	0.030	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-3	CP-SD-02-0-1.5	Sample	U-234	1.9 +/- 0.37	0.014	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-3	CP-SD-02-0-1.5	Sample	U-235	0.092 +/- 0.051	0.033	pCi/g	SOIL	AS090129-1	2/4/2009	LT
0812177-3	CP-SD-02-0-1.5	Sample	U-238	1.8 +/- 0.36	0.028	pCi/g	SOIL	AS090129-1	2/4/2009	

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:
U - Result is less than the sample specific MDC.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Isotopic Uranium By Alpha Spectroscopy Sample Results Summary

Client Name: Freeport McMoRan Sierrita
Client Project Name: FMI-VRP
Client Project Number:
Laboratory Name: ALS Environmental -- FC
PAI Work Order: 0812177

Page: 2 of 7
Reported on: Monday, December 03, 2012
11:04:32 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-4	CP-SD-02-1.5-3.0	Sample	U-234	1.2 +/- 0.27	0.046	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-4	CP-SD-02-1.5-3.0	Sample	U-235	0.043 +/- 0.039	0.023	pCi/g	SOIL	AS090129-1	2/4/2009	LT
0812177-4	CP-SD-02-1.5-3.0	Sample	U-238	1.2 +/- 0.27	0.046	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-5	CP-SD-06-0-1.5	Sample	U-234	1.7 +/- 0.34	0.037	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-5	CP-SD-06-0-1.5	Sample	U-235	0.095 +/- 0.052	0.039	pCi/g	SOIL	AS090129-1	2/4/2009	LT
0812177-5	CP-SD-06-0-1.5	Sample	U-238	1.9 +/- 0.37	0.028	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-6	CP-SD-06-1.5-3.0	Sample	U-234	1.7 +/- 0.34	0.034	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-6	CP-SD-06-1.5-3.0	Sample	U-235	0.11 +/- 0.056	0.034	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-6	CP-SD-06-1.5-3.0	Sample	U-238	1.9 +/- 0.36	0.029	pCi/g	SOIL	AS090129-1	2/4/2009	

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

- Abbreviations:
- TPU - Total Propagated Uncertainty
 - MDC - Minimum Detectable Concentration
 - BDL - Below Detection Limit

Isotopic Uranium By Alpha Spectroscopy Sample Results Summary

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Laboratory Name: ALS Environmental -- FC

PAI Work Order: 0812177

Page: 3 of 7

Reported on: Monday, December 03, 2012

11:04:33 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-7	CP-SD-05-0-1.5	Sample	U-234	2.1 +/- 0.40	0.050	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-7	CP-SD-05-0-1.5	Sample	U-235	0.15 +/- 0.068	0.035	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-7	CP-SD-05-0-1.5	Sample	U-238	2.0 +/- 0.39	0.040	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-8	CP-SD-05-1.5-3.0	Sample	U-234	2.3 +/- 0.49	0.10	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-8	CP-SD-05-1.5-3.0	Sample	U-235	0.098 +/- 0.076	0.038	pCi/g	SOIL	AS090129-1	2/4/2009	LT
0812177-8	CP-SD-05-1.5-3.0	Sample	U-238	1.9 +/- 0.44	0.11	pCi/g	SOIL	AS090129-1	2/4/2009	M3
0812177-9	CP-SD-03-0-1.5	Sample	U-234	0.98 +/- 0.23	0.049	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-9	CP-SD-03-0-1.5	Sample	U-235	0.075 +/- 0.051	0.053	pCi/g	SOIL	AS090129-1	2/4/2009	LT
0812177-9	CP-SD-03-0-1.5	Sample	U-238	1.1 +/- 0.25	0.040	pCi/g	SOIL	AS090129-1	2/4/2009	

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
M - The requested MDC was not met.
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Abbreviations:

TPU - Total Propagated Uncertainty
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BDL - Below Detection Limit

Isotopic Uranium By Alpha Spectroscopy Sample Results Summary

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Laboratory Name: ALS Environmental -- FC

PAI Work Order: 0812177

Page: 4 of 7

Reported on: Monday, December 03, 2012

11:04:33 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-10	CP-SD-03-1.5-3.0	Sample	U-234	1.8 +/- 0.42	0.13	pCi/g	SOIL	AS090129-1	2/4/2009	M3
0812177-10	CP-SD-03-1.5-3.0	Sample	U-235	0.097 +/- 0.080	0.097	pCi/g	SOIL	AS090129-1	2/4/2009	U
0812177-10	CP-SD-03-1.5-3.0	Sample	U-238	1.9 +/- 0.42	0.031	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-11	CP-P07-1-3	Sample	U-234	2.4 +/- 0.52	0.10	pCi/g	SOIL	AS090129-1	2/4/2009	M3
0812177-11	CP-P07-1-3	Sample	U-235	0.19 +/- 0.11	0.040	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-11	CP-P07-1-3	Sample	U-238	2.6 +/- 0.56	0.089	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-12	CP-P07-0-1	Sample	U-234	2.2 +/- 0.49	0.11	pCi/g	SOIL	AS090129-1	2/4/2009	M3
0812177-12	CP-P07-0-1	Sample	U-235	0.21 +/- 0.12	0.040	pCi/g	SOIL	AS090129-1	2/4/2009	
0812177-12	CP-P07-0-1	Sample	U-238	2.9 +/- 0.62	0.079	pCi/g	SOIL	AS090129-1	2/4/2009	

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Isotopic Uranium By Alpha Spectroscopy Sample Results Summary

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Laboratory Name: ALS Environmental -- FC

PAI Work Order: 0812177

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Reported on: Monday, December 03, 2012

11:04:33 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-13	CP-P07-5-7	Sample	U-234	1.9 +/- 0.36	0.10	pCi/g	SOIL	AS090129-1	2/10/2009	M3
0812177-13	CP-P07-5-7	Sample	U-235	0.074 +/- 0.068	0.098	pCi/g	SOIL	AS090129-1	2/10/2009	U
0812177-13	CP-P07-5-7	Sample	U-238	1.8 +/- 0.35	0.11	pCi/g	SOIL	AS090129-1	2/10/2009	M3
0812177-14	CP-SD-04-0-1.5	Sample	U-234	1.9 +/- 0.42	0.059	pCi/g	SOIL	AS090129-1	2/9/2009	
0812177-14	CP-SD-04-0-1.5	Sample	U-235	0.097 +/- 0.075	0.069	pCi/g	SOIL	AS090129-1	2/9/2009	LT
0812177-14	CP-SD-04-0-1.5	Sample	U-238	2.1 +/- 0.46	0.041	pCi/g	SOIL	AS090129-1	2/9/2009	
0812177-15	CP-SD-04-1.5-3.0	Sample	U-234	1.4 +/- 0.29	0.031	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-15	CP-SD-04-1.5-3.0	Sample	U-235	0.11 +/- 0.058	0.036	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-15	CP-SD-04-1.5-3.0	Sample	U-238	1.3 +/- 0.27	0.031	pCi/g	SOIL	AS090129-1	2/6/2009	

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Isotopic Uranium By Alpha Spectroscopy Sample Results Summary

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Laboratory Name: ALS Environmental -- FC

PAI Work Order: 0812177

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Reported on: Monday, December 03, 2012

11:04:33 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-16	CP-Q09-1-3	Sample	U-234	1.2 +/- 0.26	0.036	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-16	CP-Q09-1-3	Sample	U-235	0.020 +/- 0.025	0.018	pCi/g	SOIL	AS090129-1	2/6/2009	LT
0812177-16	CP-Q09-1-3	Sample	U-238	1.2 +/- 0.25	0.036	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-17	CP-SD-09-0-1.5	Sample	U-234	2.1 +/- 0.40	0.041	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-17	CP-SD-09-0-1.5	Sample	U-235	0.098 +/- 0.055	0.043	pCi/g	SOIL	AS090129-1	2/6/2009	LT
0812177-17	CP-SD-09-0-1.5	Sample	U-238	2.4 +/- 0.46	0.030	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-18	CD-SD-09-1.5-3.0	Sample	U-234	1.7 +/- 0.34	0.051	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-18	CD-SD-09-1.5-3.0	Sample	U-235	0.072 +/- 0.046	0.035	pCi/g	SOIL	AS090129-1	2/6/2009	LT
0812177-18	CD-SD-09-1.5-3.0	Sample	U-238	1.7 +/- 0.34	0.041	pCi/g	SOIL	AS090129-1	2/6/2009	

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit

Isotopic Uranium By Alpha Spectroscopy Sample Results Summary

Client Name: Freeport McMoRan Sierra

Client Project Name: FMI-VRP

Client Project Number:

Laboratory Name: ALS Environmental -- FC

PAI Work Order: 0812177

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Reported on: Monday, December 03, 2012

11:04:33 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-19	CP-P12-1-3	Sample	U-234	0.91 +/- 0.21	0.049	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-19	CP-P12-1-3	Sample	U-235	0.041 +/- 0.034	0.019	pCi/g	SOIL	AS090129-1	2/6/2009	LT
0812177-19	CP-P12-1-3	Sample	U-238	0.84 +/- 0.20	0.055	pCi/g	SOIL	AS090129-1	2/6/2009	
0812177-20	OD-SD-02-0-1.5	Sample	U-234	1.7 +/- 0.35	0.16	pCi/g	SOIL	AS090129-1	2/10/2009	M3
0812177-20	OD-SD-02-0-1.5	Sample	U-235	0.060 +/- 0.058	0.080	pCi/g	SOIL	AS090129-1	2/10/2009	U
0812177-20	OD-SD-02-0-1.5	Sample	U-238	1.9 +/- 0.38	0.10	pCi/g	SOIL	AS090129-1	2/10/2009	M3

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:
U - Result is less than the sample specific MDC.
LT - Result is less than Requested MDC, greater than sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
M - The requested MDC was not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
BDL - Below Detection Limit



Section 3

QC RESULTS SUMMARY



Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090129-1MB

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jan-09

Date Prepared: 29-Jan-09

Date Analyzed: 10-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 1000 minutes

Final Aliquot: 0.830 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.015 +/- 0.018	0.028	0.1	U
15117-96-1	U-235	0.010 +/- 0.016	0.027	0.1	U
7440-61-1	U-238	0.0043 +/- 0.019	0.036	0.1	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	5.442	4.59	pCi/g	84.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: UR0812177-1

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: AS090129-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 29-Jan-09

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Final Aliquot: 0.830 g

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	5.33 +/- 0.961	0.0714	5.23	102	82 - 122	P
7440-61-1	U-238	5.78 +/- 1.04	0.0477	5.43	106	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	5.443	4.47	pCi/g	82.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: UR0812177-1

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.2 +/- 0.42	2.0 +/- 0.39	0.27	2.13	
15117-96-1	U-235	0.14 +/- 0.067	0.084 +/- 0.050	0.72	2.13	LT
7440-61-1	U-238	2.2 +/- 0.42	2.3 +/- 0.44	0.25	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812177-1

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5

Lab ID: 0812177-17DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13966-29-5	U-234	2.1 +/- 0.40	2.1 +/- 0.41	0.10	2.13	
15117-96-1	U-235	0.098 +/- 0.055	0.12 +/- 0.060	0.26	2.13	
7440-61-1	U-238	2.4 +/- 0.46	2.1 +/- 0.41	0.40	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: UR0812177-1

Date Printed: Monday, February 16, 2009

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Section 4

INDIVIDUAL SAMPLE RESULTS

4

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 1.02 g
Lab ID: 0812177-1	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 16-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 04-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.5 +/- 0.32	0.031	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.036	0.1	
7440-61-1	U-238	1.5 +/- 0.31	0.016	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.418	3.58	pCi/g	81.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-01-1.5-3.0
Lab ID:	0812177-2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.42	0.030	0.1	
15117-96-1	U-235	0.14 +/- 0.067	0.042	0.1	
7440-61-1	U-238	2.2 +/- 0.42	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.447	3.63	pCi/g	81.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-1.5-3.0

Lab ID: 0812177-2DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.0 +/- 0.39	0.029	0.1	
15117-96-1	U-235	0.084 +/- 0.050	0.035	0.1	LT
7440-61-1	U-238	2.3 +/- 0.44	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.412	3.66	pCi/g	83.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Date Printed: Monday, February 16, 2009

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Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-02-0-1.5
Lab ID:	0812177-3

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 16-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.01 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.37	0.014	0.1	
15117-96-1	U-235	0.092 +/- 0.051	0.033	0.1	LT
7440-61-1	U-238	1.8 +/- 0.36	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.461	4.09	pCi/g	91.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-02-1.5-3.0
Lab ID:	0812177-4

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.27	0.046	0.1	
15117-96-1	U-235	0.043 +/- 0.039	0.023	0.1	LT
7440-61-1	U-238	1.2 +/- 0.27	0.046	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.474	2.81	pCi/g	62.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-06-0-1.5
Lab ID:	0812177-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.037	0.1	
15117-96-1	U-235	0.095 +/- 0.052	0.039	0.1	LT
7440-61-1	U-238	1.9 +/- 0.37	0.028	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.448	4.03	pCi/g	90.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-06-1.5-3.0
Lab ID:	0812177-6

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.034	0.1	
15117-96-1	U-235	0.11 +/- 0.056	0.034	0.1	
7440-61-1	U-238	1.9 +/- 0.36	0.029	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.507	4.04	pCi/g	89.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-05-0-1.5
Lab ID:	0812177-7

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.40	0.050	0.1	
15117-96-1	U-235	0.15 +/- 0.068	0.035	0.1	
7440-61-1	U-238	2.0 +/- 0.39	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.466	3.80	pCi/g	85.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-05-1.5-3.0	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 0.507 g
Lab ID: 0812177-8	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 16-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 04-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.3 +/- 0.49	0.10	0.1	
15117-96-1	U-235	0.098 +/- 0.076	0.038	0.1	LT
7440-61-1	U-238	1.9 +/- 0.44	0.11	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.913	7.30	pCi/g	82.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-03-0-1.5
Lab ID:	0812177-9

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 16-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.98 +/- 0.23	0.049	0.1	
15117-96-1	U-235	0.075 +/- 0.051	0.053	0.1	LT
7440-61-1	U-238	1.1 +/- 0.25	0.040	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.481	3.65	pCi/g	81.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-03-1.5-3.0	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 0.514 g
Lab ID: 0812177-10	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 16-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 04-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.8 +/- 0.42	0.13	0.1	M3
15117-96-1	U-235	0.097 +/- 0.080	0.097	0.1	U
7440-61-1	U-238	1.9 +/- 0.42	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.793	7.60	pCi/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-1-3	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 0.501 g
Lab ID: 0812177-11	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 17-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 300 minutes	Result Units: pCi/g
	Date Analyzed: 04-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.4 +/- 0.52	0.10	0.1	M3
15117-96-1	U-235	0.19 +/- 0.11	0.040	0.1	
7440-61-1	U-238	2.6 +/- 0.56	0.089	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.016	7.69	pCi/g	85.3	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P07-0-1
Lab ID:	0812177-12

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 04-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.508 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.2 +/- 0.49	0.11	0.1	M3
15117-96-1	U-235	0.21 +/- 0.12	0.040	0.1	
7440-61-1	U-238	2.9 +/- 0.62	0.079	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	8.902	7.19	pCi/g	80.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P07-5-7
Lab ID:	0812177-13

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 17-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 10-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 1000 minutes

Report Basis: Dry Weight

Final Aliquot: 0.262 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.36	0.10	0.1	M3
15117-96-1	U-235	0.074 +/- 0.068	0.098	0.1	U
7440-61-1	U-238	1.8 +/- 0.35	0.11	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	17.26	14.7	pCi/g	84.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-04-0-1.5
Lab ID:	0812177-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 09-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 0.500 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9 +/- 0.42	0.059	0.1	
15117-96-1	U-235	0.097 +/- 0.075	0.069	0.1	LT
7440-61-1	U-238	2.1 +/- 0.46	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	9.034	7.72	pCi/g	85.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-04-1.5-3.0
Lab ID:	0812177-15

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 17-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4 +/- 0.29	0.031	0.1	
15117-96-1	U-235	0.11 +/- 0.058	0.036	0.1	
7440-61-1	U-238	1.3 +/- 0.27	0.031	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.455	3.57	pCi/g	80.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-Q09-1-3
Lab ID:	0812177-16

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.2 +/- 0.26	0.036	0.1	
15117-96-1	U-235	0.020 +/- 0.025	0.018	0.1	LT
7440-61-1	U-238	1.2 +/- 0.25	0.036	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.505	3.63	pCi/g	80.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-SD-09-0-1.5
Lab ID:	0812177-17

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.40	0.041	0.1	
15117-96-1	U-235	0.098 +/- 0.055	0.043	0.1	LT
7440-61-1	U-238	2.4 +/- 0.46	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.480	3.72	pCi/g	83.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5

Lab ID: 0812177-17DUP

Sample Matrix: SOIL

Prep SOP: PAI 778 Rev 12

Date Collected: 28-Jul-08

Date Prepared: 29-Jan-09

Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1

QCBatchID: AS090129-1-1

Run ID: AS090129-1A

Count Time: 300 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.1 +/- 0.41	0.036	0.1	
15117-96-1	U-235	0.12 +/- 0.060	0.035	0.1	
7440-61-1	U-238	2.1 +/- 0.41	0.030	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.414	3.68	pCi/g	83.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CD-SD-09-1.5-3.0
Lab ID:	0812177-18

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 28-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.34	0.051	0.1	
15117-96-1	U-235	0.072 +/- 0.046	0.035	0.1	LT
7440-61-1	U-238	1.7 +/- 0.34	0.041	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.388	3.63	pCi/g	82.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID:	CP-P12-1-3
Lab ID:	0812177-19

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 12
Date Collected: 23-Jul-08
Date Prepared: 29-Jan-09
Date Analyzed: 06-Feb-09

Prep Batch: AS090129-1
QCBatchID: AS090129-1-1
Run ID: AS090129-1A
Count Time: 300 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0.91 +/- 0.21	0.049	0.1	
15117-96-1	U-235	0.041 +/- 0.034	0.019	0.1	LT
7440-61-1	U-238	0.84 +/- 0.20	0.055	0.1	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.446	3.70	pCi/g	83.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1

Isotopic Uranium By Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5	Sample Matrix: SOIL	Prep Batch: AS090129-1	Final Aliquot: 0.252 g
Lab ID: 0812177-20	Prep SOP: PAI 778 Rev 12	QCBatchID: AS090129-1-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: AS090129-1A	Moisture(%): NA
	Date Prepared: 29-Jan-09	Count Time: 1000 minutes	Result Units: pCi/g
	Date Analyzed: 10-Feb-09	Report Basis: Dry Weight	File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.7 +/- 0.35	0.16	0.1	M3
15117-96-1	U-235	0.060 +/- 0.058	0.080	0.1	U
7440-61-1	U-238	1.9 +/- 0.38	0.10	0.1	M3

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	17.95	14.4	pCi/g	80.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: UR0812177-1



Section 5

RAW DATA

5

Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER %Spk. Recov RPD	Flags
0812177-1	U-232 Tracer	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 9	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	757.700 11.000	31.07% 1000	300 81.0%	3.58 0.584	0.0527 NA	pCi/g Dry Weight	NA NA	
0812177-1	U-234 Trg. Analyte	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 9	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	265.700 1.000	31.07% 1000	300 81.0%	1.5 0.32	0.031 NA	pCi/g Dry Weight	NA NA	
0812177-1	U-235 Trg. Analyte	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 9	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	15.700 1.000	31.07% 1000	300 81.0%	0.11 0.058	0.036 NA	pCi/g Dry Weight	NA NA	
0812177-1	U-238 Trg. Analyte	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 9	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	263.000 0.000	31.07% 1000	300 81.0%	1.5 0.31	0.016 NA	pCi/g Dry Weight	NA NA	
0812177-2	U-232 Tracer	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 10a	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	778.400 2.000	31.67% 1000	300 81.7%	3.63 0.591	0.0294 NA	pCi/g Dry Weight	NA NA	
0812177-2	U-234 Trg. Analyte	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 10a	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	377.700 1.000	31.67% 1000	300 81.7%	2.2 0.42	0.030 NA	pCi/g Dry Weight	NA NA	
0812177-2	U-235 Trg. Analyte	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 10a	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	21.400 2.000	31.67% 1000	300 81.7%	0.14 0.067	0.042 NA	pCi/g Dry Weight	NA NA	
0812177-2	U-238 Trg. Analyte	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 10a	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	378.700 1.000	31.67% 1000	300 81.7%	2.2 0.42	0.030 NA	pCi/g Dry Weight	NA NA	
0812177-2	U-232 Tracer	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 11	AS090129-1A Spectrum #1	2/4/2009 9:25 AM	788.800 4.000	31.58% 1000	300 83.0%	3.66 0.595	0.0362 NA	pCi/g Dry Weight	NA NA	
0812177-2	U-234 Trg. Analyte	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 11	AS090129-1A Spectrum #1	2/4/2009 9:25 AM	358.700 1.000	31.58% 1000	300 83.0%	2.0 0.39	0.029 NA	pCi/g Dry Weight	0.27 NA	
0812177-2	U-235 Trg. Analyte	7/16/2008 8:30:00 AM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	1.02 g 1.02 g	AlphaSpec2 11	AS090129-1A Spectrum #1	2/4/2009 9:25 AM	12.700 1.000	31.58% 1000	300 83.0%	0.084 0.050	0.035 NA	pCi/g Dry Weight	0.72 NA	LT

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- D - DER is greater than Control Limit of 2.13
- + - Duplicate RPD not within limits.
- LT - Result is less than Request MDC, greater than sample specific MDC
- * - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

- The Tracer results are not yield corrected (i.e. activity measured not activity added).
- Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

- TR - Tracer
- TA - Target Analyte
- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration
- DER - Duplicate Error Ratio
- BDL - Below Detection Limit

Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER %Spk. Recov RPD	Flags
0812177-2	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/4/2009	413,700	31.58%	300	2.3	0.029	pCi/g	0.25	
DUP	Trg. Analyte	8:30:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	11	Spectrum #1	9:25 AM	1,000	1000	83.0%	0.44	NA	Dry Weight	NA	
0812177-3	U-232	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	839,518	30.45%	300	4.09	0.0256	pCi/g	NA	
SMP	Tracer	9:08:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	12	Spectrum #1	9:25 AM	1,000	1000	91.6%	0.660	NA	Dry Weight	NA	
0812177-3	U-234	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	365,635	30.45%	300	1.9	0.014	pCi/g	NA	
SMP	Trg. Analyte	9:08:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	12	Spectrum #1	9:25 AM	0,000	1000	91.6%	0.37	NA	Dry Weight	NA	
0812177-3	U-235	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	14,700	30.45%	300	0.092	0.033	pCi/g	NA	
SMP	Trg. Analyte	9:08:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	12	Spectrum #1	9:25 AM	1,000	1000	91.6%	0.051	NA	Dry Weight	NA	LT
0812177-3	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	347,160	30.45%	300	1.8	0.028	pCi/g	NA	
SMP	Trg. Analyte	9:08:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	12	Spectrum #1	9:25 AM	1,000	1000	91.6%	0.36	NA	Dry Weight	NA	
0812177-4	U-232	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	608,100	32.25%	300	2.81	0.0328	pCi/g	NA	
SMP	Tracer	9:08:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	13	Spectrum #1	9:25 AM	3,000	1000	62.7%	0.469	NA	Dry Weight	NA	
0812177-4	U-234	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	162,400	32.25%	300	1.2	0.046	pCi/g	NA	
SMP	Trg. Analyte	9:08:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	13	Spectrum #1	9:25 AM	2,000	1000	62.7%	0.27	NA	Dry Weight	NA	
0812177-4	U-235	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	5,000	32.25%	300	0.043	0.023	pCi/g	NA	
SMP	Trg. Analyte	9:08:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	13	Spectrum #1	9:25 AM	0,000	1000	62.7%	0.039	NA	Dry Weight	NA	LT
0812177-4	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	158,400	32.25%	300	1.2	0.046	pCi/g	NA	
SMP	Trg. Analyte	9:08:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	13	Spectrum #1	9:25 AM	2,000	1000	62.7%	0.27	NA	Dry Weight	NA	
0812177-5	U-232	7/16/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/4/2009	845,500	31.00%	300	4.03	0.0401	pCi/g	NA	
SMP	Tracer	9:26:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	14	Spectrum #1	9:25 AM	5,000	1000	90.6%	0.650	NA	Dry Weight	NA	
0812177-5	U-234	7/16/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/4/2009	331,100	31.00%	300	1.7	0.037	pCi/g	NA	
SMP	Trg. Analyte	9:26:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	14	Spectrum #1	9:25 AM	3,000	1000	90.6%	0.34	NA	Dry Weight	NA	

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- D - DER is greater than Control Limit of 2.13
- + - Duplicate RPD not within limits.
- LT - Result is less than Request MDC, greater than sample specific MDC
- * - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

- The Tracer results are not yield corrected (i.e. activity measured not activity added).
- Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

- TR - Tracer
- TA - Target Analyte
- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration
- DER - Duplicate Error Ratio
- BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

Page 2 of 9

Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
0812177-5	U-235	7/16/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/4/2009	15,400	31.00%	300	0.095	0.039	pCi/g	NA	NA
	Trg. Analyte	9:26:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	14	Spectrum #1	9:25 AM	2,000	1000	90.6%	0.052	NA	Dry Weight	NA	LT
0812177-5	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/4/2009	360,700	31.00%	300	1.9	0.028	pCi/g	NA	NA
	Trg. Analyte	9:26:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	14	Spectrum #1	9:25 AM	830,500	30.77%	300	4.04	0.0409	pCi/g	NA	NA
0812177-6	U-232	7/16/2008	AS090129-1	NA	NA	SOIL	1 g	AlphaSpec2	AS090129-1A	2/4/2009	830,500	30.77%	300	4.04	0.0409	pCi/g	NA	NA
	Tracer	9:26:00 AM	AS090129-1-1	NA	NA	NA	1 g	16	Spectrum #1	9:26 AM	5,000	1000	89.7%	0.653	NA	Dry Weight	NA	NA
0812177-6	U-234	7/16/2008	AS090129-1	NA	NA	SOIL	1 g	AlphaSpec2	AS090129-1A	2/4/2009	316,400	30.77%	300	1.7	0.034	pCi/g	NA	NA
	Trg. Analyte	9:26:00 AM	AS090129-1-1	NA	NA	NA	1 g	16	Spectrum #1	9:26 AM	2,000	1000	89.7%	0.34	NA	Dry Weight	NA	NA
0812177-6	U-235	7/16/2008	AS090129-1	NA	NA	SOIL	1 g	AlphaSpec2	AS090129-1A	2/4/2009	16,700	30.77%	300	0.11	0.034	pCi/g	NA	NA
	Trg. Analyte	9:26:00 AM	AS090129-1-1	NA	NA	NA	1 g	16	Spectrum #1	9:26 AM	1,000	1000	89.7%	0.056	NA	Dry Weight	NA	NA
0812177-6	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	1 g	AlphaSpec2	AS090129-1A	2/4/2009	343,700	30.77%	300	1.9	0.029	pCi/g	NA	NA
	Trg. Analyte	9:26:00 AM	AS090129-1-1	NA	NA	NA	1 g	16	Spectrum #1	9:26 AM	1,000	1000	89.7%	0.36	NA	Dry Weight	NA	NA
0812177-7	U-232	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	791,800	30.93%	300	3.80	0.0729	pCi/g	NA	NA
	Tracer	9:45:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	17	Spectrum #1	9:26 AM	24,000	1000	85.1%	0.617	NA	Dry Weight	NA	NA
0812177-7	U-234	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	366,200	30.93%	300	2.1	0.050	pCi/g	NA	NA
	Trg. Analyte	9:45:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	17	Spectrum #1	9:26 AM	6,000	1000	85.1%	0.40	NA	Dry Weight	NA	NA
0812177-7	U-235	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	22,700	30.93%	300	0.15	0.035	pCi/g	NA	NA
	Trg. Analyte	9:45:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	17	Spectrum #1	9:26 AM	1,000	1000	85.1%	0.068	NA	Dry Weight	NA	NA
0812177-7	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	360,100	30.93%	300	2.0	0.040	pCi/g	NA	NA
	Trg. Analyte	9:45:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	17	Spectrum #1	9:26 AM	3,000	1000	85.1%	0.39	NA	Dry Weight	NA	NA
0812177-8	U-232	7/16/2008	AS090129-1	NA	NA	SOIL	0.507 g	AlphaSpec2	AS090129-1A	2/4/2009	750,400	30.42%	300	7.30	0.167	pCi/g	NA	NA
	Tracer	9:45:00 AM	AS090129-1-1	NA	NA	NA	0.507 g	18	Spectrum #1	9:26 AM	32,000	1000	82.0%	1.19	NA	Dry Weight	NA	NA

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
- M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.
- Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer

TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclDev	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
0812177-8	U-234	7/16/2008	AS090129-1	NA	NA	SOIL	0.507 g	AlphaSpec2	AS090129-1A	2/4/2009	189,500	30.42%	300	2.3	0.10	pCi/g	NA	NA
	Trg. Analyte	9:45:00 AM	AS090129-1-1	NA	NA	NA	0.507 g	18	Spectrum #1	9:26 AM	5,000	1000	82.0%	0.49	NA	Dry Weight	NA	NA
0812177-8	U-235	7/16/2008	AS090129-1	NA	NA	SOIL	0.507 g	AlphaSpec2	AS090129-1A	2/4/2009	7,000	30.42%	300	0.098	0.038	pCi/g	NA	NA
	Trg. Analyte	9:45:00 AM	AS090129-1-1	NA	NA	NA	0.507 g	18	Spectrum #1	9:26 AM	0,000	1000	82.0%	0.076	NA	Dry Weight	NA	LT
0812177-8	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	0.507 g	AlphaSpec2	AS090129-1A	2/4/2009	163,900	30.42%	300	1.9	0.11	pCi/g	NA	NA
	Trg. Analyte	9:45:00 AM	AS090129-1-1	NA	NA	NA	0.507 g	18	Spectrum #1	9:26 AM	7,000	1000	82.0%	0.44	NA	Dry Weight	NA	M3
0812177-9	U-232	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	711,800	29.06%	300	3.65	0.0627	pCi/g	NA	NA
	Tracer	9:54:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	19	Spectrum #1	9:26 AM	14,000	1000	81.4%	0.599	NA	Dry Weight	NA	NA
0812177-9	U-234	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	155,800	29.06%	300	0.98	0.049	pCi/g	NA	NA
	Trg. Analyte	9:54:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	19	Spectrum #1	9:26 AM	4,000	1000	81.4%	0.23	NA	Dry Weight	NA	NA
0812177-9	U-235	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	10,100	29.06%	300	0.075	0.053	pCi/g	NA	NA
	Trg. Analyte	9:54:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	19	Spectrum #1	9:26 AM	3,000	1000	81.4%	0.051	NA	Dry Weight	NA	LT
0812177-9	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/4/2009	180,400	29.06%	300	1.1	0.040	pCi/g	NA	NA
	Trg. Analyte	9:54:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	19	Spectrum #1	9:26 AM	2,000	1000	81.4%	0.25	NA	Dry Weight	NA	NA
0812177-10	U-232	7/16/2008	AS090129-1	NA	NA	SOIL	0.514 g	AlphaSpec2	AS090129-1A	2/4/2009	758,500	29.15%	300	7.60	0.126	pCi/g	NA	NA
	Tracer	9:54:00 AM	AS090129-1-1	NA	NA	NA	0.514 g	21	Spectrum #1	9:26 AM	15,000	1000	86.4%	1.24	NA	Dry Weight	NA	NA
0812177-10	U-234	7/16/2008	AS090129-1	NA	NA	SOIL	0.514 g	AlphaSpec2	AS090129-1A	2/4/2009	156,700	29.15%	300	1.8	0.13	pCi/g	NA	NA
	Trg. Analyte	9:54:00 AM	AS090129-1-1	NA	NA	NA	0.514 g	21	Spectrum #1	9:26 AM	11,000	1000	86.4%	0.42	NA	Dry Weight	NA	M3
0812177-10	U-235	7/16/2008	AS090129-1	NA	NA	SOIL	0.514 g	AlphaSpec2	AS090129-1A	2/4/2009	7,100	29.15%	300	0.097	0.097	pCi/g	NA	NA
	Trg. Analyte	9:54:00 AM	AS090129-1-1	NA	NA	NA	0.514 g	21	Spectrum #1	9:26 AM	3,000	1000	86.4%	0.080	NA	Dry Weight	NA	U
0812177-10	U-238	7/16/2008	AS090129-1	NA	NA	SOIL	0.514 g	AlphaSpec2	AS090129-1A	2/4/2009	161,000	29.15%	300	1.9	0.031	pCi/g	NA	NA
	Trg. Analyte	9:54:00 AM	AS090129-1-1	NA	NA	NA	0.514 g	21	Spectrum #1	9:26 AM	0,000	1000	86.4%	0.42	NA	Dry Weight	NA	NA

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- D - DER is greater than Control Limit of 2.13
- + - Duplicate RPD not within limits.
- LT - Result is less than Request MDC, greater than sample specific MDC
- * - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

- The Tracer results are not yield corrected (i.e. activity measured not activity added).
- Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER %Spk. Recov RPD	Flags
0812177-11	U-232 Tracer	7/17/2008 2:04:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.501 g 0.501 g	22	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	722.400 12.000	28.13% 1000	300 85.3%	7.69 1.26	0.123 NA	pCi/g Dry Weight	NA NA	
0812177-11	U-234 Trg. Analyte	7/17/2008 2:04:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.501 g 0.501 g	22	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	189.500 5.000	28.13% 1000	300 85.3%	2.4 0.52	0.10 NA	pCi/g Dry Weight	NA NA	M3
0812177-11	U-235 Trg. Analyte	7/17/2008 2:04:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.501 g 0.501 g	22	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	13.000 0.000	28.13% 1000	300 85.3%	0.19 0.11	0.040 NA	pCi/g Dry Weight	NA NA	
0812177-11	U-238 Trg. Analyte	7/17/2008 2:04:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.501 g 0.501 g	22	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	211.100 3.000	28.13% 1000	300 85.3%	2.6 0.56	0.089 NA	pCi/g Dry Weight	NA NA	
0812177-12	U-232 Tracer	7/17/2008 2:04:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.508 g 0.508 g	23	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	708.300 9.000	29.14% 1000	300 80.8%	7.19 1.18	0.105 NA	pCi/g Dry Weight	NA NA	
0812177-12	U-234 Trg. Analyte	7/17/2008 2:04:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.508 g 0.508 g	23	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	174.200 6.000	29.14% 1000	300 80.8%	2.2 0.49	0.11 NA	pCi/g Dry Weight	NA NA	M3
0812177-12	U-235 Trg. Analyte	7/17/2008 2:04:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.508 g 0.508 g	23	AS090129-1A Spectrum #1	2/4/2009 9:26 AM	233.400 2.000	29.14% 1000	300 80.8%	2.9 0.62	0.079 NA	pCi/g Dry Weight	NA NA	
0812177-13	U-232 Tracer	7/17/2008 2:11:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.262 g 0.262 g	25	AS090129-1A Spectrum #1	2/10/2009 2:05 PM	2478.000 20.000	29.10% 1000	1000 84.9%	14.7 2.22	0.139 NA	pCi/g Dry Weight	NA NA	
0812177-13	U-234 Trg. Analyte	7/17/2008 2:11:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.262 g 0.262 g	25	AS090129-1A Spectrum #1	2/10/2009 2:05 PM	266.000 7.000	29.10% 1000	1000 84.9%	1.9 0.36	0.10 NA	pCi/g Dry Weight	NA NA	M3
0812177-13	U-235 Trg. Analyte	7/17/2008 2:11:00 PM	AS090129-1 AS090129-1-1	NA NA	NA NA	SOIL NA	0.262 g 0.262 g	25	AS090129-1A Spectrum #1	2/10/2009 2:05 PM	9.000 4.000	29.10% 1000	1000 84.9%	0.074 0.068	0.098 NA	pCi/g Dry Weight	NA NA	U

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
+ - Duplicate RPD not within limits.
LT - Result is less than Request MDC, greater than sample specific MDC
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Notes:
1) The Tracer results are not yield corrected (i.e. activity measured not activity added).
2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:
TR - Tracer TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclDev	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
0812177-13	U-238	7/17/2008	AS090129-1	NA	NA	SOIL	0.262 g	AlphaSpec2	AS090129-1A	2/10/2009	255,000	29,10%	1000	1.8	0.11	pCi/g	NA	NA
	Trg. Analyte	2:11:00 PM	AS090129-1-1	NA	NA	NA	0.262 g	25	Spectrum #1	2:05 PM	8,000	1000	84.9%	0.35	NA	Dry Weight	NA	M3
0812177-14	U-232	7/17/2008	AS090129-1	NA	NA	SOIL	0.5 g	AlphaSpec2	AS090129-1A	2/9/2009	811,758	31.58%	300	7.72	0.0733	pCi/g	NA	NA
	Tracer	2:52:00 PM	AS090129-1-1	NA	NA	NA	0.5 g	11	Spectrum #1	8:55 PM	3,865	1000	85.4%	1.25	NA	Dry Weight	NA	NA
0812177-14	U-234	7/17/2008	AS090129-1	NA	NA	SOIL	0.5 g	AlphaSpec2	AS090129-1A	2/9/2009	169,971	31.58%	300	1.9	0.059	pCi/g	NA	NA
	Trg. Analyte	2:52:00 PM	AS090129-1-1	NA	NA	NA	0.5 g	11	Spectrum #1	8:55 PM	1,000	1000	85.4%	0.42	NA	Dry Weight	NA	NA
0812177-14	U-235	7/17/2008	AS090129-1	NA	NA	SOIL	0.5 g	AlphaSpec2	AS090129-1A	2/9/2009	7,429	31.58%	300	0.097	0.069	pCi/g	NA	NA
	Trg. Analyte	2:52:00 PM	AS090129-1-1	NA	NA	NA	0.5 g	11	Spectrum #1	8:55 PM	1,000	1000	85.4%	0.075	NA	Dry Weight	NA	LT
0812177-14	U-238	7/17/2008	AS090129-1	NA	NA	SOIL	0.5 g	AlphaSpec2	AS090129-1A	2/9/2009	189,418	31.58%	300	2.1	0.041	pCi/g	NA	NA
	Trg. Analyte	2:52:00 PM	AS090129-1-1	NA	NA	NA	0.5 g	11	Spectrum #1	8:55 PM	0,135	1000	85.4%	0.46	NA	Dry Weight	NA	NA
0812177-15	U-232	7/17/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/6/2009	761,200	31.58%	300	3.57	0.0419	pCi/g	NA	NA
	Tracer	2:52:00 PM	AS090129-1-1	NA	NA	NA	1.01 g	11	Spectrum #1	9:01 AM	6,000	1000	80.1%	0.581	NA	Dry Weight	NA	NA
0812177-15	U-234	7/17/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/6/2009	242,700	31.58%	300	1.4	0.031	pCi/g	NA	NA
	Trg. Analyte	2:52:00 PM	AS090129-1-1	NA	NA	NA	1.01 g	11	Spectrum #1	9:01 AM	1,000	1000	80.1%	0.29	NA	Dry Weight	NA	NA
0812177-15	U-235	7/17/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/6/2009	15,700	31.58%	300	0.11	0.036	pCi/g	NA	NA
	Trg. Analyte	2:52:00 PM	AS090129-1-1	NA	NA	NA	1.01 g	11	Spectrum #1	9:01 AM	1,000	1000	80.1%	0.058	NA	Dry Weight	NA	NA
0812177-15	U-238	7/17/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/6/2009	216,700	31.58%	300	1.3	0.031	pCi/g	NA	NA
	Trg. Analyte	2:52:00 PM	AS090129-1-1	NA	NA	NA	1.01 g	11	Spectrum #1	9:01 AM	1,000	1000	80.1%	0.27	NA	Dry Weight	NA	NA
0812177-16	U-232	7/23/2008	AS090129-1	NA	NA	SOIL	1 g	AlphaSpec2	AS090129-1A	2/6/2009	782,800	32.25%	300	3.63	0.0362	pCi/g	NA	NA
	Tracer	10:15:00 AM	AS090129-1-1	NA	NA	NA	1 g	13	Spectrum #1	9:01 AM	4,000	1000	80.6%	0.591	NA	Dry Weight	NA	NA
0812177-16	U-234	7/23/2008	AS090129-1	NA	NA	SOIL	1 g	AlphaSpec2	AS090129-1A	2/6/2009	208,400	32.25%	300	1.2	0.036	pCi/g	NA	NA
	Trg. Analyte	10:15:00 AM	AS090129-1-1	NA	NA	NA	1 g	13	Spectrum #1	9:01 AM	2,000	1000	80.6%	0.26	NA	Dry Weight	NA	NA

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
+ - Duplicate RPD not within limits.
LT - Result is less than Request MDC, greater than sample specific MDC
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- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).
2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC Batch ID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclDev	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
0812177-16	U-235	7/23/2008	AS090129-1	NA	NA	SOIL	1 g	AlphaSpec2	AS090129-1A	2/6/2009	3,000	32.25%	300	0.020	0.018	pCi/g	NA	NA
	Trg. Analyte	10:15:00 AM	AS090129-1-1	NA	NA	NA	1 g	13	Spectrum #1	9:01 AM	0,000	1000	80.6%	0.025	NA	Dry Weight	NA	LT
0812177-16	U-238	7/23/2008	AS090129-1	NA	NA	SOIL	1 g	AlphaSpec2	AS090129-1A	2/6/2009	205,400	32.25%	300	1.2	0.036	pCi/g	NA	NA
	Trg. Analyte	10:15:00 AM	AS090129-1-1	NA	NA	NA	1 g	13	Spectrum #1	9:01 AM	2,000	1000	80.6%	0.25	NA	Dry Weight	NA	NA
0812177-17	U-232	7/28/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/6/2009	774,500	31.00%	300	3.72	0.0404	pCi/g	NA	NA
	Tracer	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	14	Spectrum #1	9:01 AM	5,000	1000	83.0%	0.605	NA	Dry Weight	NA	NA
0812177-17	U-234	7/28/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/6/2009	356,100	31.00%	300	2.1	0.041	pCi/g	NA	NA
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	14	Spectrum #1	9:01 AM	3,000	1000	83.0%	0.40	NA	Dry Weight	NA	NA
0812177-17	U-235	7/28/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/6/2009	14,400	31.00%	300	0.098	0.043	pCi/g	NA	NA
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	14	Spectrum #1	9:01 AM	2,000	1000	83.0%	0.055	NA	Dry Weight	NA	LT
0812177-17	U-238	7/28/2008	AS090129-1	NA	NA	SOIL	1.01 g	AlphaSpec2	AS090129-1A	2/6/2009	413,700	31.00%	300	2.4	0.030	pCi/g	NA	NA
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.01 g	14	Spectrum #1	9:01 AM	1,000	1000	83.0%	0.46	NA	Dry Weight	NA	NA
0812177-17	U-232	7/28/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/6/2009	772,500	30.77%	300	3.68	0.0401	pCi/g	NA	NA
	Tracer	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	16	Spectrum #1	9:01 AM	5,000	1000	83.4%	0.599	NA	Dry Weight	NA	NA
0812177-17	U-234	7/28/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/6/2009	370,400	30.77%	300	2.1	0.036	pCi/g	NA	0.10
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	16	Spectrum #1	9:01 AM	2,000	1000	83.4%	0.41	NA	Dry Weight	NA	NA
0812177-17	U-235	7/28/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/6/2009	17,700	30.77%	300	0.12	0.035	pCi/g	NA	0.26
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	16	Spectrum #1	9:01 AM	1,000	1000	83.4%	0.060	NA	Dry Weight	NA	NA
0812177-17	U-238	7/28/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/6/2009	375,700	30.77%	300	2.1	0.030	pCi/g	NA	0.40
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	16	Spectrum #1	9:01 AM	1,000	1000	83.4%	0.41	NA	Dry Weight	NA	NA
0812177-18	U-232	7/28/2008	AS090129-1	NA	NA	SOIL	1.03 g	AlphaSpec2	AS090129-1A	2/6/2009	769,200	30.93%	300	3.63	0.0740	pCi/g	NA	NA
	Tracer	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.03 g	17	Spectrum #1	9:01 AM	26,000	1000	82.6%	0.591	NA	Dry Weight	NA	NA

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
+ - Duplicate RPD not within limits.
LT - Result is less than Request MDC, greater than sample specific MDC
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

Notes:

M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
NC - Not Calculated for duplicate results less than 5 times MDC
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TR - Tracer
TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
0812177-18	U-234	7/28/2008	AS090129-1	NA	NA	SOIL	1.03 g	AlphaSpec2	AS090129-1A	2/6/2009	296.200	30.93%	300	1.7	0.051	pCi/g	NA	NA
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.03 g	17	Spectrum #1	9:01 AM	6.000	1000	82.6%	0.34	NA	Dry Weight	NA	NA
0812177-18	U-235	7/28/2008	AS090129-1	NA	NA	SOIL	1.03 g	AlphaSpec2	AS090129-1A	2/6/2009	10.700	30.93%	300	0.072	0.035	pCi/g	NA	NA
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.03 g	17	Spectrum #1	9:01 AM	1.000	1000	82.6%	0.046	NA	Dry Weight	NA	LT
0812177-18	U-238	7/28/2008	AS090129-1	NA	NA	SOIL	1.03 g	AlphaSpec2	AS090129-1A	2/6/2009	298.100	30.93%	300	1.7	0.041	pCi/g	NA	NA
	Trg. Analyte	10:39:00 AM	AS090129-1-1	NA	NA	NA	1.03 g	17	Spectrum #1	9:01 AM	3.000	1000	82.6%	0.34	NA	Dry Weight	NA	NA
0812177-19	U-232	7/23/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/6/2009	762.100	30.42%	300	3.70	0.0842	pCi/g	NA	NA
	Tracer	11:03:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	18	Spectrum #1	9:01 AM	33.000	1000	83.2%	0.604	NA	Dry Weight	NA	NA
0812177-19	U-234	7/23/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/6/2009	156.500	30.42%	300	0.91	0.049	pCi/g	NA	NA
	Trg. Analyte	11:03:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	18	Spectrum #1	9:01 AM	5.000	1000	83.2%	0.21	NA	Dry Weight	NA	NA
0812177-19	U-235	7/23/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/6/2009	6.000	30.42%	300	0.041	0.019	pCi/g	NA	NA
	Trg. Analyte	11:03:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	18	Spectrum #1	9:01 AM	0.000	1000	83.2%	0.034	NA	Dry Weight	NA	LT
0812177-19	U-238	7/23/2008	AS090129-1	NA	NA	SOIL	1.02 g	AlphaSpec2	AS090129-1A	2/6/2009	143.900	30.42%	300	0.84	0.055	pCi/g	NA	NA
	Trg. Analyte	11:03:00 AM	AS090129-1-1	NA	NA	NA	1.02 g	18	Spectrum #1	9:01 AM	7.000	1000	83.2%	0.20	NA	Dry Weight	NA	NA
0812177-20	U-232	7/28/2008	AS090129-1	NA	NA	SOIL	0.252 g	AlphaSpec2	AS090129-1A	2/10/2009	2461.000	30.59%	1000	14.4	0.152	pCi/g	NA	NA
	Tracer	11:11:00 AM	AS090129-1-1	NA	NA	NA	0.252 g	26	Spectrum #1	2:05 PM	25.000	1000	80.2%	2.18	NA	Dry Weight	NA	NA
0812177-20	U-234	7/28/2008	AS090129-1	NA	NA	SOIL	0.252 g	AlphaSpec2	AS090129-1A	2/10/2009	235.000	30.59%	1000	1.7	0.16	pCi/g	NA	M3
	Trg. Analyte	11:11:00 AM	AS090129-1-1	NA	NA	NA	0.252 g	26	Spectrum #1	2:05 PM	18.000	1000	80.2%	0.35	NA	Dry Weight	NA	NA
0812177-20	U-235	7/28/2008	AS090129-1	NA	NA	SOIL	0.252 g	AlphaSpec2	AS090129-1A	2/10/2009	7.000	30.59%	1000	0.060	0.080	pCi/g	NA	NA
	Trg. Analyte	11:11:00 AM	AS090129-1-1	NA	NA	NA	0.252 g	26	Spectrum #1	2:05 PM	2.000	1000	80.2%	0.058	NA	Dry Weight	NA	U
0812177-20	U-238	7/28/2008	AS090129-1	NA	NA	SOIL	0.252 g	AlphaSpec2	AS090129-1A	2/10/2009	261.000	30.59%	1000	1.9	0.10	pCi/g	NA	NA
	Trg. Analyte	11:11:00 AM	AS090129-1-1	NA	NA	NA	0.252 g	26	Spectrum #1	2:05 PM	6.000	1000	80.2%	0.38	NA	Dry Weight	NA	M3

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
+ - Duplicate RPD not within limits.
LT - Result is less than Request MDC, greater than sample specific MDC
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

- L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
NC - Not Calculated for duplicate results less than 5 times MDC
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

- 1) The Tracer results are not yield corrected (i.e. activity measured not activity added).
2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

- TR - Tracer TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Isotopic Uranium By Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC Batch ID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CntDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
AS090129-1	U-232 Tracer	1/29/2009 1:11:18 PM	AS090129-1 AS090129-1-1	NA	NA	SOIL	0.83 g 0.83 g	AlphaSpec2 27	AS090129-1A Spectrum #1	2/10/2009 2:05 PM	2520,000 19,000	29.78% 1000	1000 84.4%	4.59 0.695	0.0419 NA	pCi/g Dry Weight	NA NA	NA
AS090129-1	U-234 Trg. Analyte	1/29/2009 1:11:18 PM	AS090129-1 AS090129-1-1	NA	NA	SOIL	0.83 g 0.83 g	AlphaSpec2 27	AS090129-1A Spectrum #1	2/10/2009 2:05 PM	7,000 5,000	29.78% 1000	1000 84.4%	0.015 0.018	0.028 NA	pCi/g Dry Weight	NA NA	U
AS090129-1	U-235 Trg. Analyte	1/29/2009 1:11:18 PM	AS090129-1 AS090129-1-1	NA	NA	SOIL	0.83 g 0.83 g	AlphaSpec2 27	AS090129-1A Spectrum #1	2/10/2009 2:05 PM	4,000 3,000	29.78% 1000	1000 84.4%	0.010 0.016	0.027 NA	pCi/g Dry Weight	NA NA	U
AS090129-1	U-238 Trg. Analyte	1/29/2009 1:11:18 PM	AS090129-1 AS090129-1-1	NA	NA	SOIL	0.83 g 0.83 g	AlphaSpec2 27	AS090129-1A Spectrum #1	2/10/2009 2:05 PM	2,000 9,000	29.78% 1000	1000 84.4%	0.0043 0.019	0.036 NA	pCi/g Dry Weight	NA NA	U
AS090129-1	U-232 Tracer	1/29/2009 1:11:18 PM	AS090129-1 AS090129-1-1	NA	NA	SOIL	0.83 g 0.83 g	AlphaSpec2 23	AS090129-1A Spectrum #1	2/6/2009 9:01 AM	720,300 9,000	29.14% 1000	300 82.1%	4.47 0.733	0.0642 NA	pCi/g Dry Weight	NA NA	NA
AS090129-1	U-234 Trg. Analyte	1/29/2009 1:11:18 PM	AS090129-1 AS090129-1-1	NA	NA	SOIL	0.83 g 0.83 g	AlphaSpec2 23	AS090129-1A Spectrum #1	2/6/2009 9:01 AM	704,900 7,000	29.14% 1000	300 82.1%	5.33 0.961	0.0714 NA	pCi/g Dry Weight	NA NA	102
AS090129-1	U-238 Trg. Analyte	1/29/2009 1:11:18 PM	AS090129-1 AS090129-1-1	NA	NA	SOIL	0.83 g 0.83 g	AlphaSpec2 23	AS090129-1A Spectrum #1	2/6/2009 9:01 AM	764,400 2,000	29.14% 1000	300 82.1%	5.78 1.04	0.0477 NA	pCi/g Dry Weight	NA NA	106

Comments:

Data Package ID: UR0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
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H - LCS Recovery above upper control limit.
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N - Matrix Spike Recovery outside control limits
NC - Not Calculated for duplicate results less than 5 times MDC
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Abbreviations:

TR - Tracer
TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Paragon Analytics

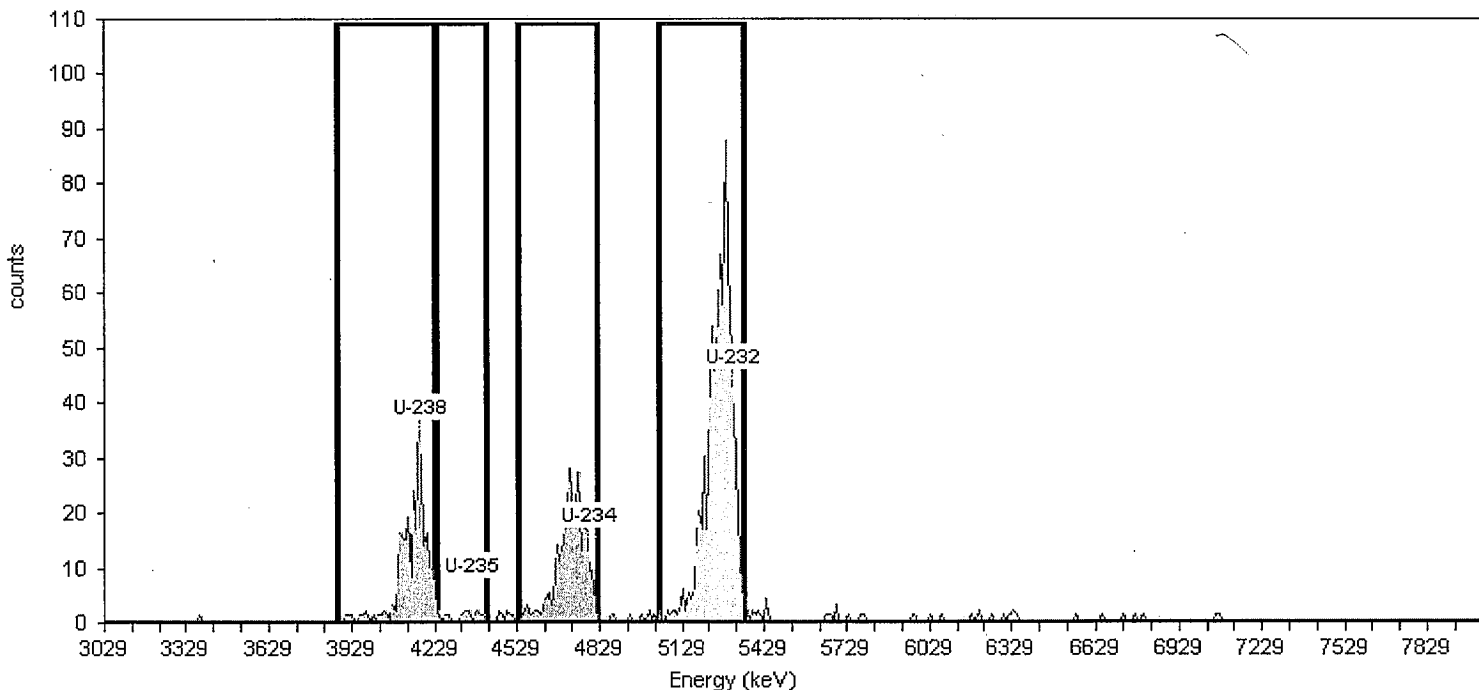
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-1 Spectrum #1 Analysis #1	Sample Size : 1.00
---	--------------------

Acquisition Detector: 9 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:02AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
--	---

Calibration Bkgd Info: Sample: B09020309; Det: 9; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:31:39AM Efficiency Calibration: C09020309 Efficiency: 31.07% +/- 0.20% TPU(2 sigma)	Energy Calibration: C09020309 Energy Cal: Gain = 9.8224 keV / Ch Offset = 3,019.57 keV Quadratic = 0.0000 keV / Ch ²
---	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 82.26%
--	--



Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4178.6	3874.1	4227.7	32.9	100.2	263.00	0.00	263.00	1.5E+000	2.7E-001	0.0E+000	1.6E-002
U-235	4365.2	4237.6	4414.4	79.3	99.7	16.00	0.30	15.70	9.3E-002	4.9E-002	6.1E-003	2.8E-002
U-234	4787.6	4532.2	4817.1	110.1	100.0	266.00	0.30	265.70	1.6E+000	2.7E-001	6.0E-003	2.8E-002
U-232	5318.0	5043.0	5357.3	72.4	100.1	761.00	3.30	757.70	3.7E+000	2.7E-001	2.0E-002	5.7E-002

Reviewed By: *EMF* *JP*

Print Date: 2/6/2009 3:10:17PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

Paragon Analytics

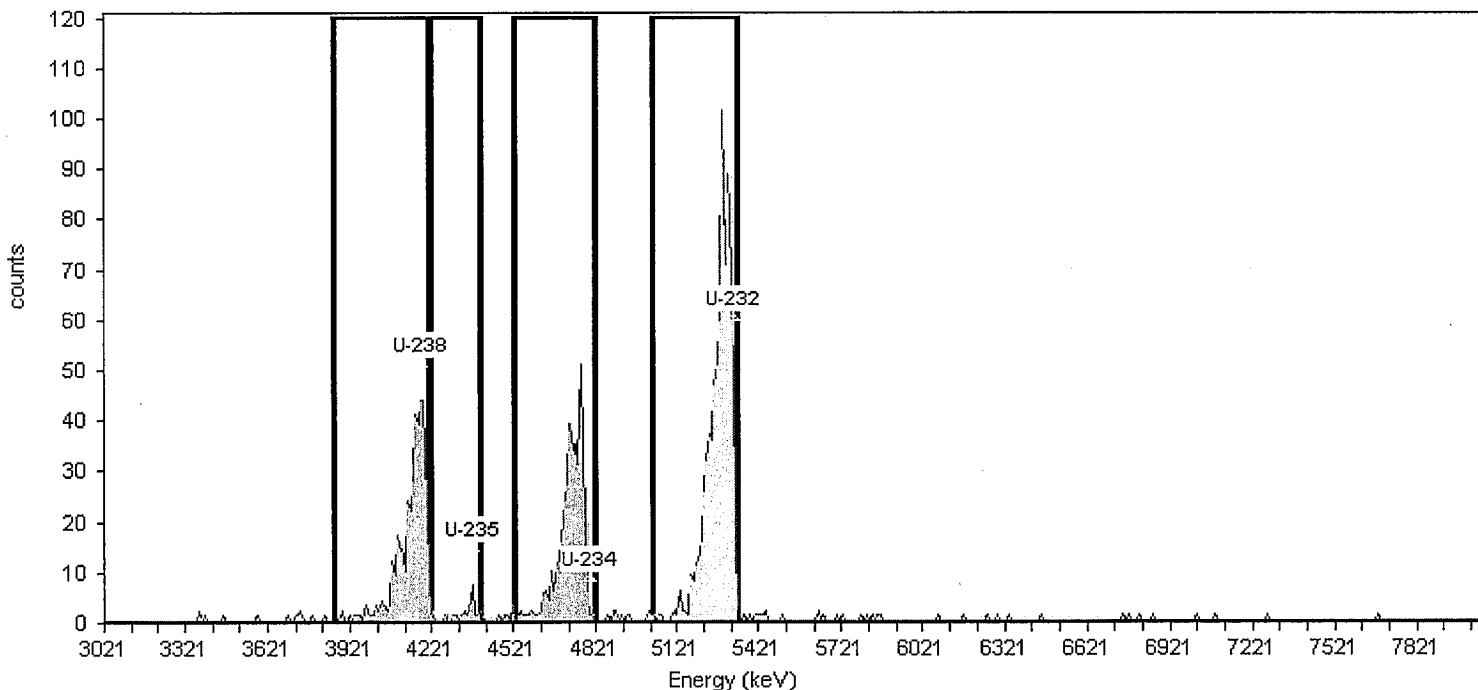
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-2 Spectrum #1 Analysis #1	Sample Size : 1.00
---	--------------------

Acquisition Detector: 10a Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:06AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
--	---

Calibration Bkgd Info: Sample: B09020310; Det: 10a; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:32:04AM Efficiency Calibration: C09020310 Efficiency: 31.67% +/- 0.15% TPU(2 sigma)	Energy Calibration: C09020310 Energy Cal: Gain = 9.9003 keV / Ch Offset = 3,011.38 keV Quadratic = 0.0000 keV / Ch ²
---	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 82.92%
--	--



Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4140.0	3852.9	4209.3	69.6	100.2	379.00	0.30	378.70	2.2E+000	3.5E-001	5.9E-003	2.7E-002
U-235	4328.1	4219.2	4397.4	27.8	99.7	22.00	0.60	21.40	1.2E-001	5.7E-002	8.3E-003	3.2E-002
U-234	4753.8	4526.1	4813.2	78.3	100.0	378.00	0.30	377.70	2.2E+000	3.5E-001	5.9E-003	2.7E-002
U-232	5288.4	5031.0	5347.8	90.5	100.1	779.00	0.60	778.40	3.8E+000	2.7E-001	8.5E-003	3.3E-002

Reviewed By: *EMF* *JP*

Print Date: 2/6/2009 3:10:58PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

Paragon Analytics

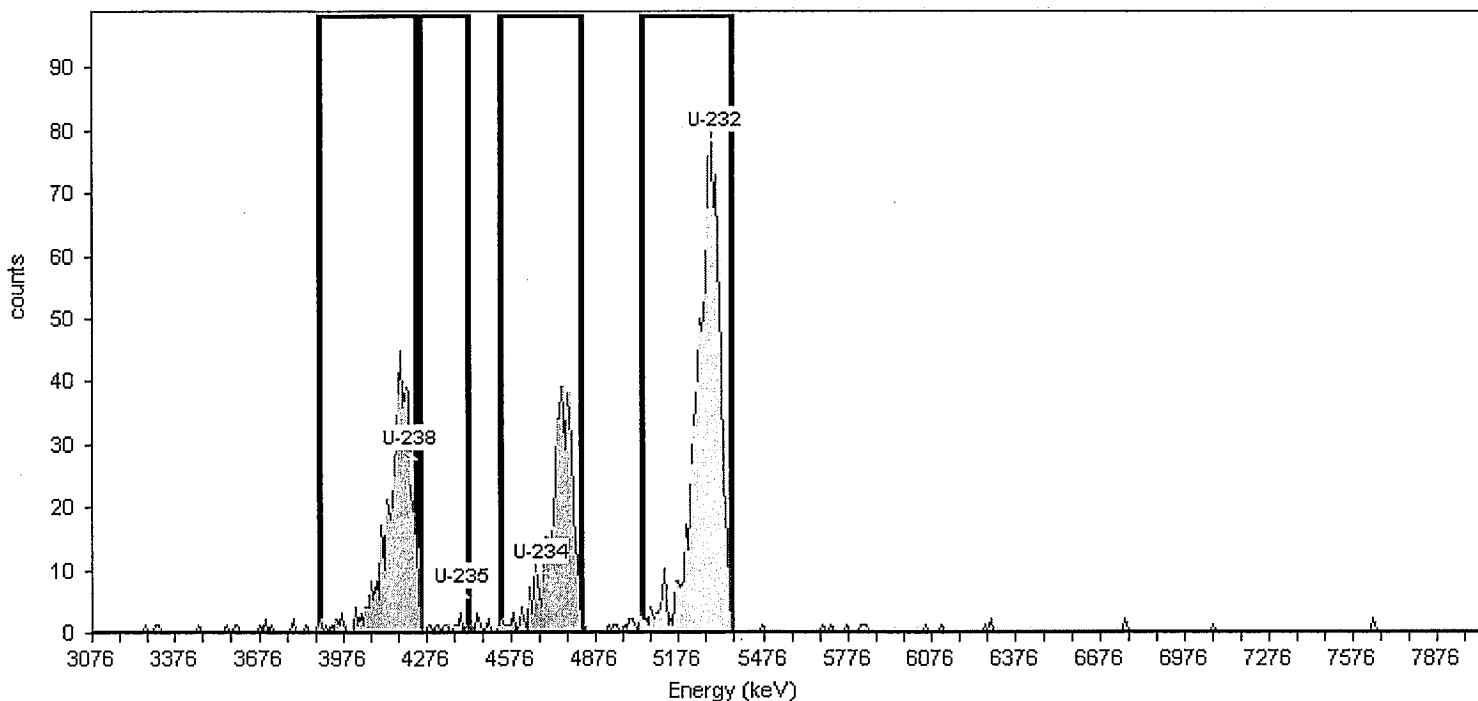
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-2D Spectrum #1 Analysis #1	Sample Size : 1.00
--	--------------------

Acquisition Detector: 11 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:25:57AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
---	---

Calibration Bkgd Info: Sample: B09020311; Det: 11; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:32:26AM Efficiency Calibration: C09020311 Efficiency: 31.58% +/- 0.16% TPU(2 sigma)	Energy Calibration: C09020311 Energy Cal: Gain = 9.7450 keV / Ch Offset = 3,066.77 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 84.25%
--	--



Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4216.7	3885.3	4236.2	44.4	100.2	414.00	0.30	413.70	2.3E+000	3.7E-001	5.8E-003	2.7E-002
U-235	4401.8	4245.9	4421.3	37.6	99.7	13.00	0.30	12.70	7.2E-002	4.2E-002	5.8E-003	2.7E-002
U-234	4679.6	4538.3	4820.9	87.6	100.0	359.00	0.30	358.70	2.0E+000	3.3E-001	5.8E-003	2.7E-002
U-232	5308.1	5045.0	5366.6	70.0	100.1	790.00	1.20	788.80	3.8E+000	2.7E-001	1.2E-002	3.9E-002

Reviewed By: *WME* *JP*

Paragon Analytics

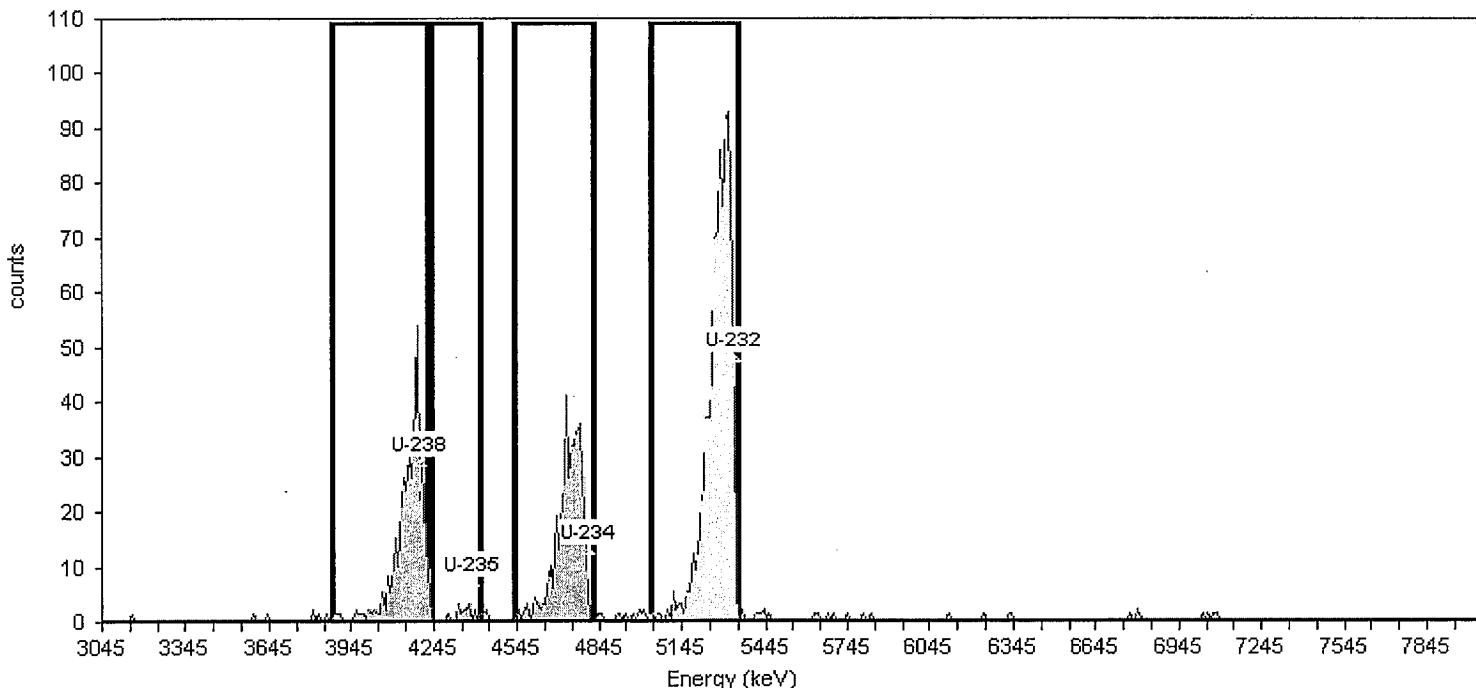
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-3 Spectrum #1 Analysis #1	Sample Size : 1.00
---	--------------------

Acquisition Detector: 12 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:25:58AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
---	---

Calibration Bkgd Info: Sample: B09020312; Det: 12; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:32:47AM Efficiency Calibration: C09020312 Efficiency: 30.45% +/- 0.21% TPU(2 sigma)	Energy Calibration: C09020312 Energy Cal: Gain = 9.8047 keV / Ch Offset = 3,036.00 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 93.00%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4161.8	3877.4	4230.4	105.5	100.2	347.46	0.30	347.16	1.8E+000	3.0E-001	5.4E-003	2.5E-002
U-235	4348.1	4240.2	4416.7	105.1	99.7	15.00	0.30	14.70	7.8E-002	4.3E-002	5.5E-003	2.5E-002
U-234	4769.7	4544.1	4828.5	84.0	100.0	365.63	0.00	365.63	1.9E+000	3.1E-001	0.0E+000	1.4E-002
U-232	5299.1	5044.2	5357.9	84.8	100.1	839.82	0.30	839.52	4.2E+000	2.9E-001	5.5E-003	2.6E-002

Reviewed By: gmf JP

Print Date: 2/6/2009 3:12:28PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

Paragon Analytics

Alpha-Spectroscopy Analysis Report

Sample: 0812177-4
Spectrum #1 Analysis #1

Sample Size : 1.00

Detector: 13
Batch Name: UAS090129-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition

Acquisition Start Date: 2/4/2009 9:25:59AM
Live Time: 300.00 min.
Real Time: 300.01 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B09020313; Det: 13; Spectrum #1; Feb-03-2009 14:40

Calibration Date: 2/3/2009 10:33:09AM

Efficiency Calibration: C09020313

Efficiency: 32.25% +/- 0.13% TPU(2 sigma)

Energy Calibration: C09020313

Energy Cal: Gain = 9.8047 keV / Ch

Offset = 3,026.20 keV

Quadratic = 0.0000 keV / Ch²

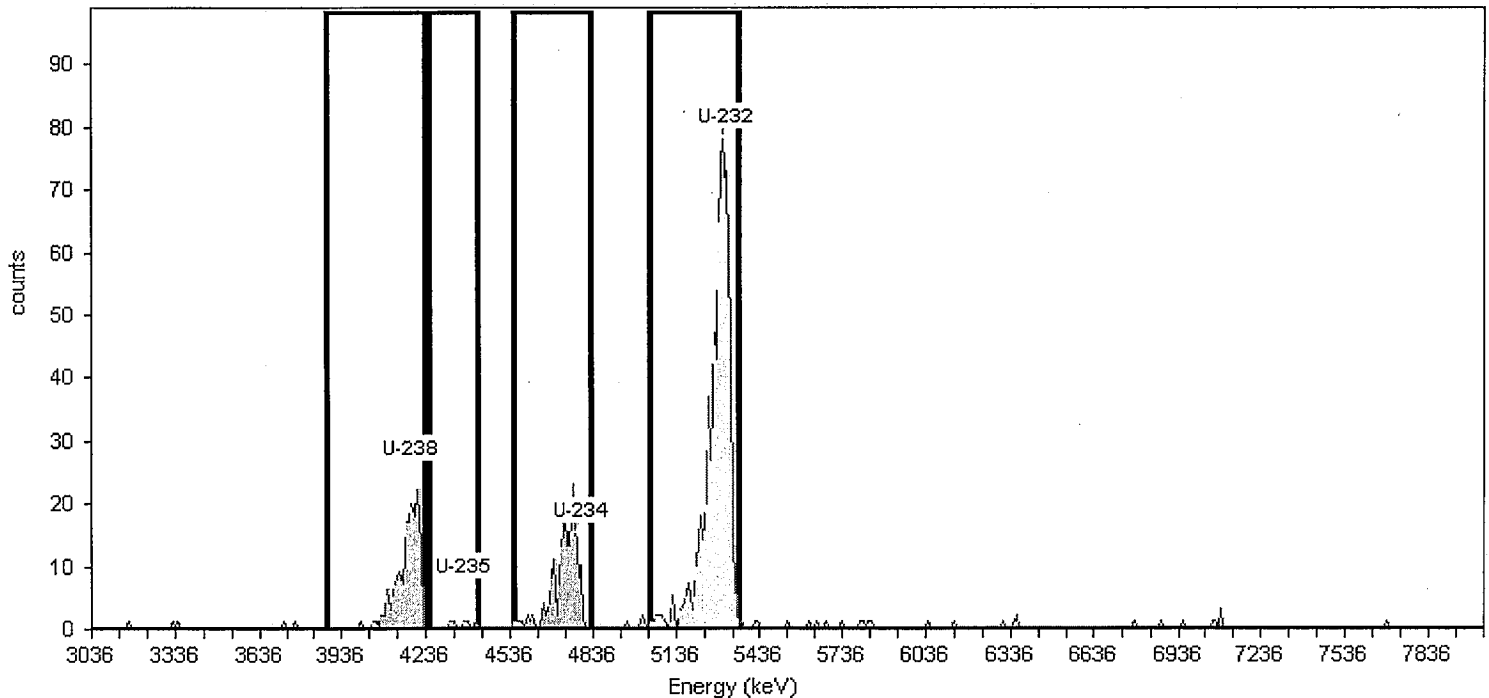
Tracer

Tracer Name: 837.3610.11 U-232

Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM

Tracer Nuclide: U-232

Tracer Recovery: 63.71%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4163.6	3879.2	4232.2	38.3	100.2	159.00	0.60	158.40	1.2E+000	2.4E-001	1.1E-002	4.1E-002
U-235	4349.8	4242.0	4418.5	70.4	99.7	5.00	0.00	5.00	3.7E-002	3.6E-002	0.0E+000	2.0E-002
U-234	4771.4	4545.9	4830.3	65.8	100.0	163.00	0.60	162.40	1.2E+000	2.4E-001	1.1E-002	4.1E-002
U-232	5300.9	5046.0	5359.7	66.6	100.1	610.00	0.90	609.10	2.9E+000	2.3E-001	1.3E-002	4.7E-002

Reviewed By:

CMF

JP

Print Date: 2/6/2009 3:12:44PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

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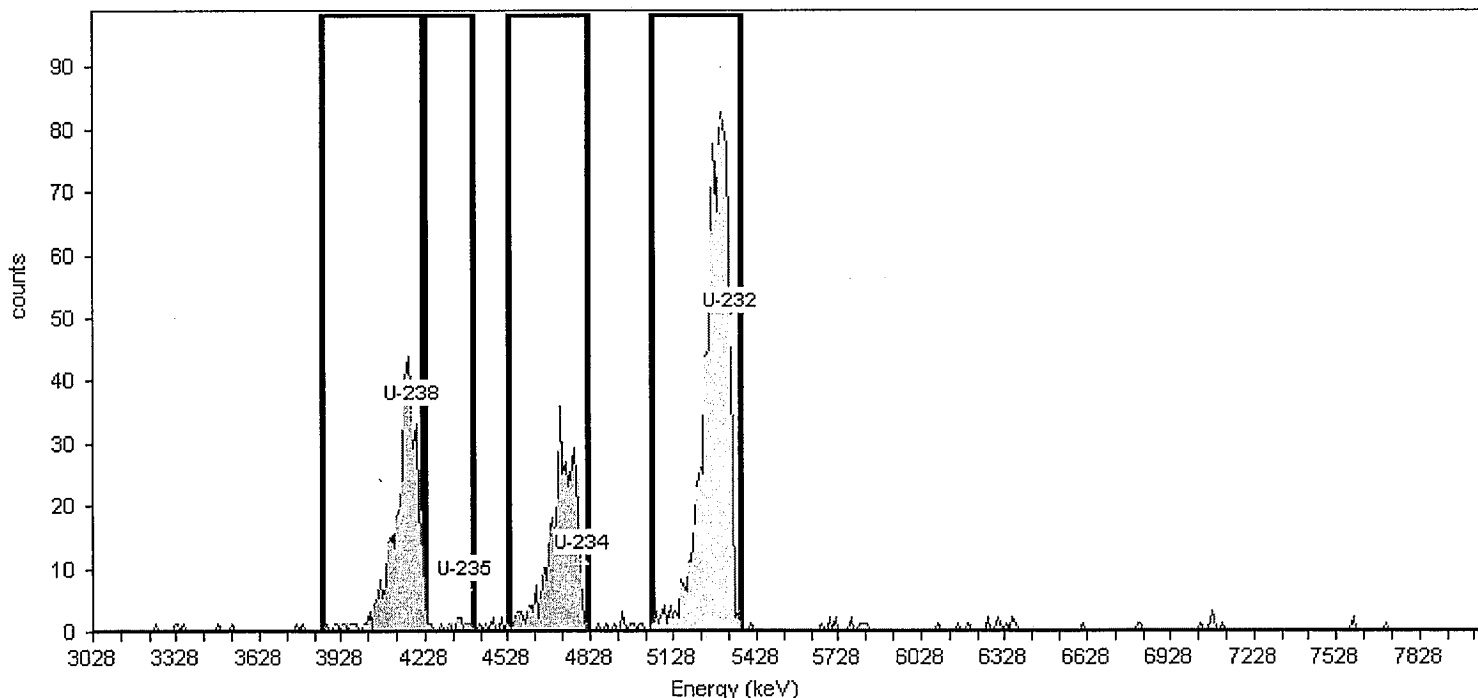
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-5 Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 14 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:25:59AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
---	---

Calibration Bkgd Info: Sample: B09020314; Det: 14; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:33:30AM Efficiency Calibration: C09020314 Efficiency: 31.00% +/- 0.15% TPU(2 sigma)	Energy Calibration: C09020314 Energy Cal: Gain = 9.8810 keV / Ch Offset = 3,018.33 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 91.99%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4184.3	3858.2	4213.9	46.1	100.2	361.00	0.30	360.70	1.9E+000	3.0E-001	5.4E-003	2.5E-002
U-235	4372.0	4223.8	4401.7	.0	99.7	16.00	0.60	15.40	8.1E-002	4.4E-002	7.7E-003	3.0E-002
U-234	4796.9	4530.1	4816.7	104.5	100.0	332.00	0.90	331.10	1.7E+000	2.9E-001	9.4E-003	3.3E-002
U-232	5330.5	5053.8	5370.0	62.5	100.1	847.00	1.50	845.50	4.2E+000	2.9E-001	1.2E-002	3.9E-002

Reviewed By: *EMF* *JP*

Print Date: 2/6/2009 3:13:47PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

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Paragon Analytics

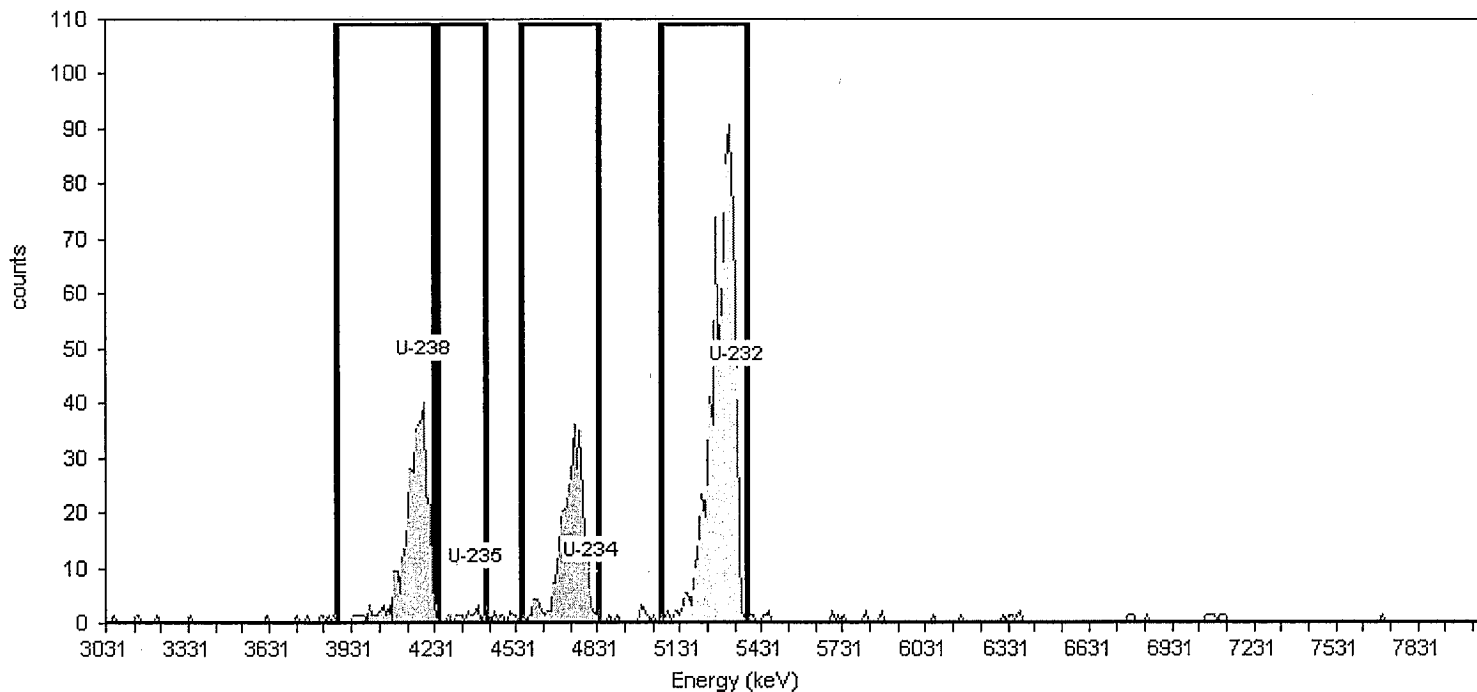
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-6 Spectrum #1 Analysis #1	Sample Size : 1.00
---	--------------------

Acquisition Detector: 16 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:00AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
---	---

Calibration Bkgd Info: Sample: B09020316; Det: 16; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:33:53AM Efficiency Calibration: C09020316 Efficiency: 30.77% +/- 0.12% TPU(2 sigma)	Energy Calibration: C09020316 Energy Cal: Gain = 9.9003 keV / Ch Offset = 3,021.28 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 91.06%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4189.5	3872.7	4229.1	38.9	100.2	344.00	0.30	343.70	1.8E+000	3.0E-001	5.5E-003	2.5E-002
U-235	4377.6	4239.0	4417.2	31.0	99.7	17.00	0.30	16.70	9.0E-002	4.6E-002	5.5E-003	2.6E-002
U-234	4803.3	4545.9	4833.0	91.2	100.0	317.00	0.60	316.40	1.7E+000	2.8E-001	7.8E-003	3.0E-002
U-232	5337.9	5060.7	5377.5	59.9	100.1	832.00	1.50	830.50	4.1E+000	2.9E-001	1.3E-002	4.0E-002

Reviewed By: *Em R-* *JP*

Paragon Analytics

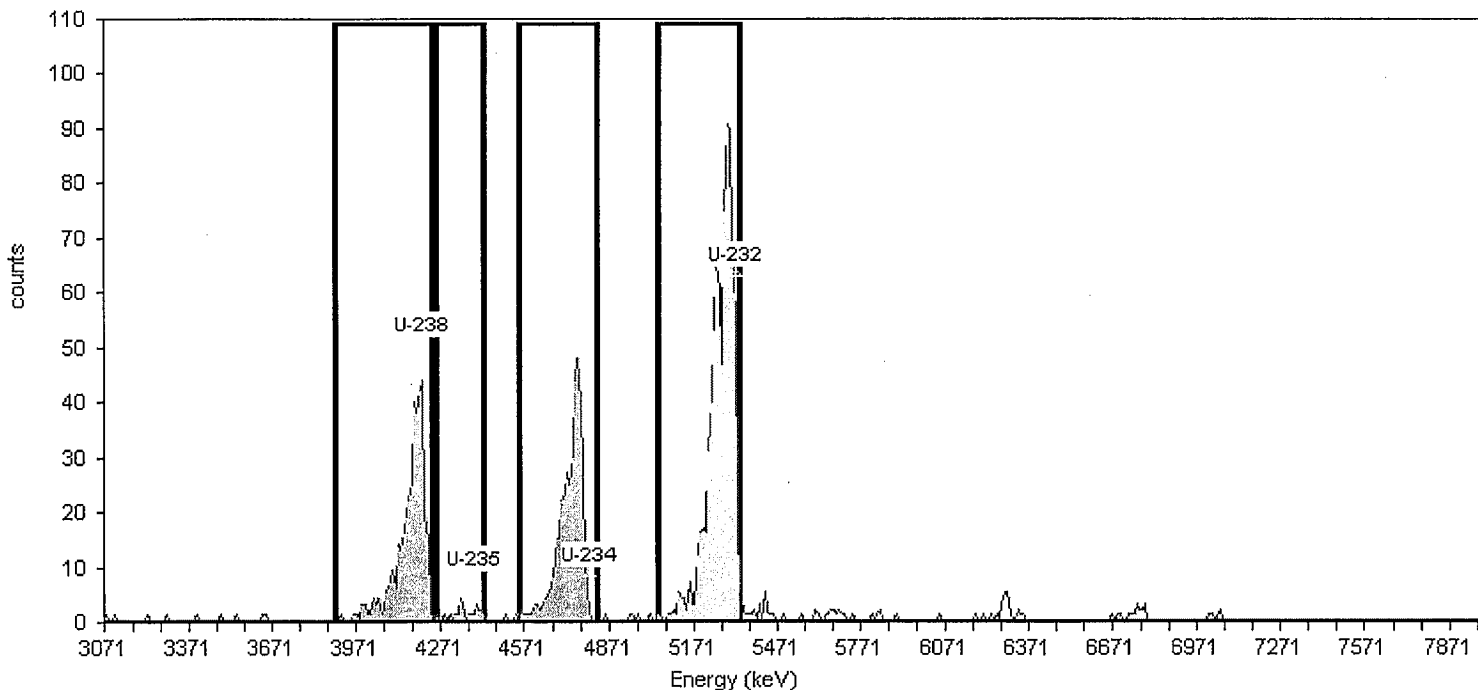
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-7 Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 17 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:01AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020317; Det: 17; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:12:59PM Efficiency Calibration: C09020317 Efficiency: 30.93% +/- 0.20% TPU(2 sigma)	Energy Calibration: C09020317 Energy Cal: Gain = 9.6533 keV / Ch Offset = 3,061.36 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 86.36%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4200.4	3891.5	4239.1	28.2	100.2	361.00	0.90	360.10	2.0E+000	3.3E-001	1.0E-002	3.5E-002
U-235	4383.9	4248.7	4422.5	92.8	99.7	23.00	0.30	22.70	1.3E-001	5.7E-002	5.8E-003	2.7E-002
U-234	4799.0	4548.0	4827.9	71.5	100.0	368.00	1.80	366.20	2.1E+000	3.3E-001	1.4E-002	4.3E-002
U-232	5320.2	5040.3	5339.5	86.2	100.1	799.00	7.20	791.80	3.9E+000	2.8E-001	2.9E-002	7.3E-002

Reviewed By: *EMF* *JP*

Paragon Analytics

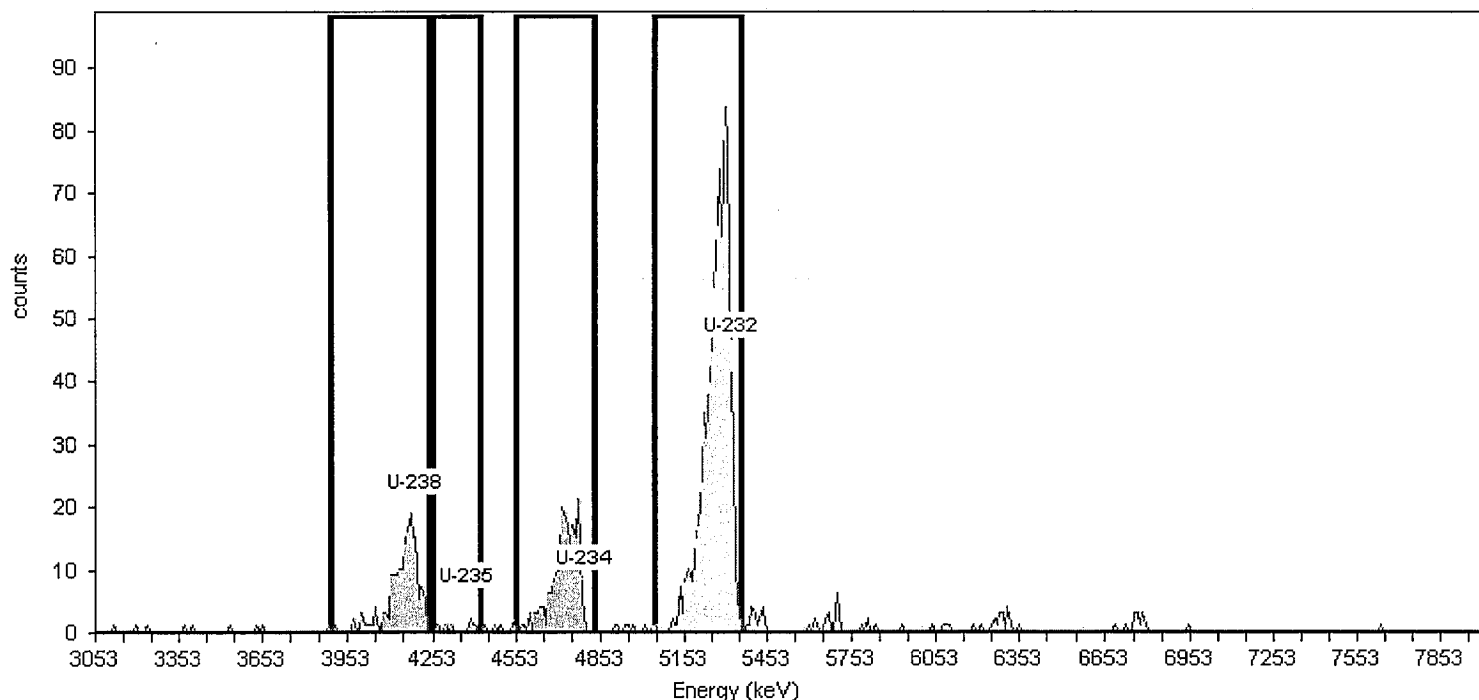
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-8 Spectrum #1 Analysis #1	Sample Size : 0.50
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Acquisition Detector: 18 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:02AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020318; Det: 18; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:13:24PM Efficiency Calibration: C09020318 Efficiency: 30.42% +/- 0.15% TPU(2 sigma)	Energy Calibration: C09020318 Energy Cal: Gain = 9.7289 keV / Ch Offset = 3,043.84 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 83.21%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4191.8	3890.2	4240.5	53.0	100.2	166.00	2.10	163.90	1.9E+000	3.9E-001	3.2E-002	9.6E-002
U-235	4376.7	4250.2	4425.3	31.5	99.7	7.00	0.00	7.00	8.3E-002	6.8E-002	0.0E+000	3.2E-002
U-234	4795.0	4551.8	4833.9	83.3	100.0	191.00	1.50	189.50	2.2E+000	4.3E-001	2.7E-002	8.7E-002
U-232	5320.4	5048.0	5359.3	47.3	100.1	760.00	9.60	750.40	7.5E+000	5.6E-001	7.0E-002	1.7E-001

Reviewed By: *gmc* *JP*

Paragon Analytics

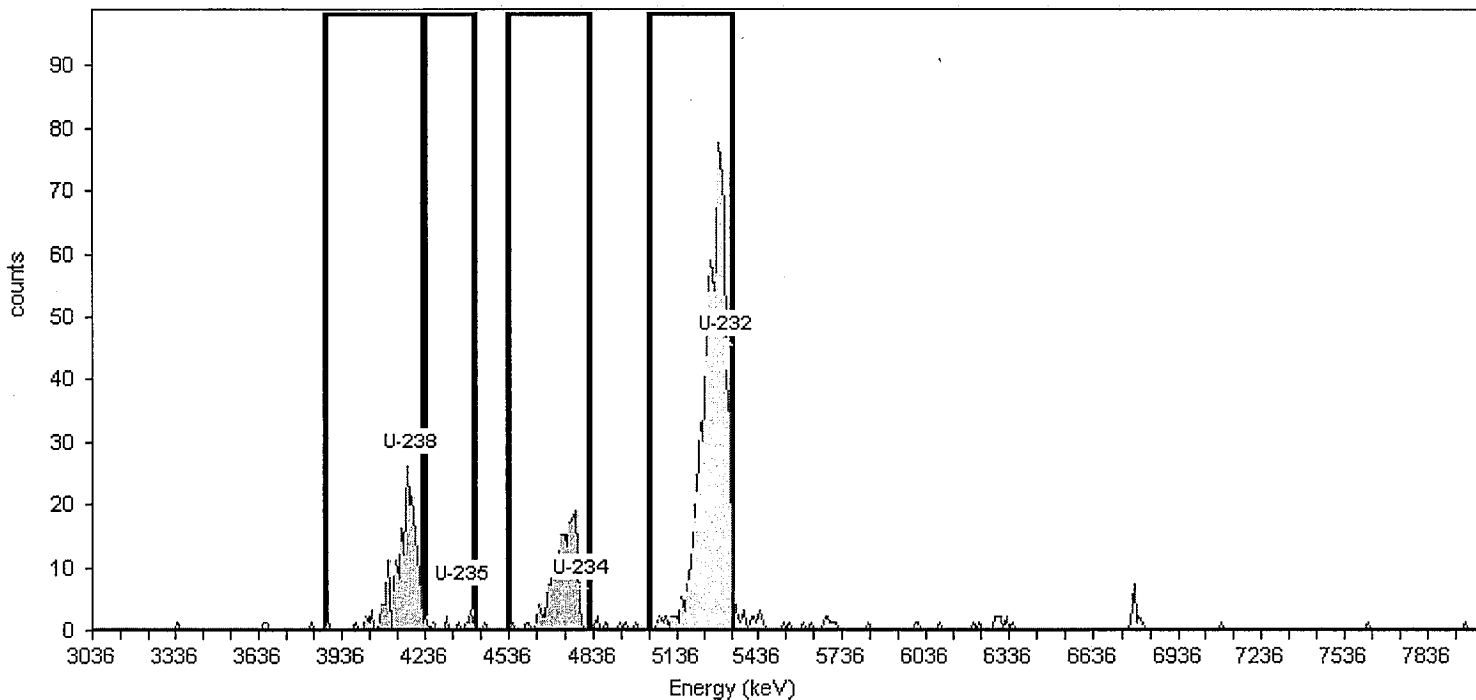
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-9 Spectrum #1 Analysis #1	Sample Size : 1.00
---	--------------------

Acquisition Detector: 19 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:02AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %
---	---

Calibration Bkgd Info: Sample: B09020319; Det: 19; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:13:46PM Efficiency Calibration: C09020319 Efficiency: 29.06% +/- 0.16% TPU(2 sigma)	Energy Calibration: C09020319 Energy Cal: Gain = 9.8047 keV / Ch Offset = 3,026.20 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 82.62%
--	--



Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4183.2	3869.4	4222.4	38.9	100.2	181.00	0.60	180.40	1.1E+000	2.2E-001	9.1E-003	3.5E-002
U-235	4369.5	4232.2	4408.7	17.0	99.7	11.00	0.90	10.10	6.3E-002	4.4E-002	1.1E-002	3.9E-002
U-234	4791.1	4536.1	4820.5	73.1	100.0	157.00	1.20	155.80	9.7E-001	2.0E-001	1.3E-002	4.3E-002
U-232	5320.5	5036.2	5340.1	90.9	100.1	716.00	4.20	711.80	3.7E+000	2.8E-001	2.4E-002	6.6E-002

Reviewed By: *2mrf* *JP*

Print Date: 2/6/2009 3:18:23PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

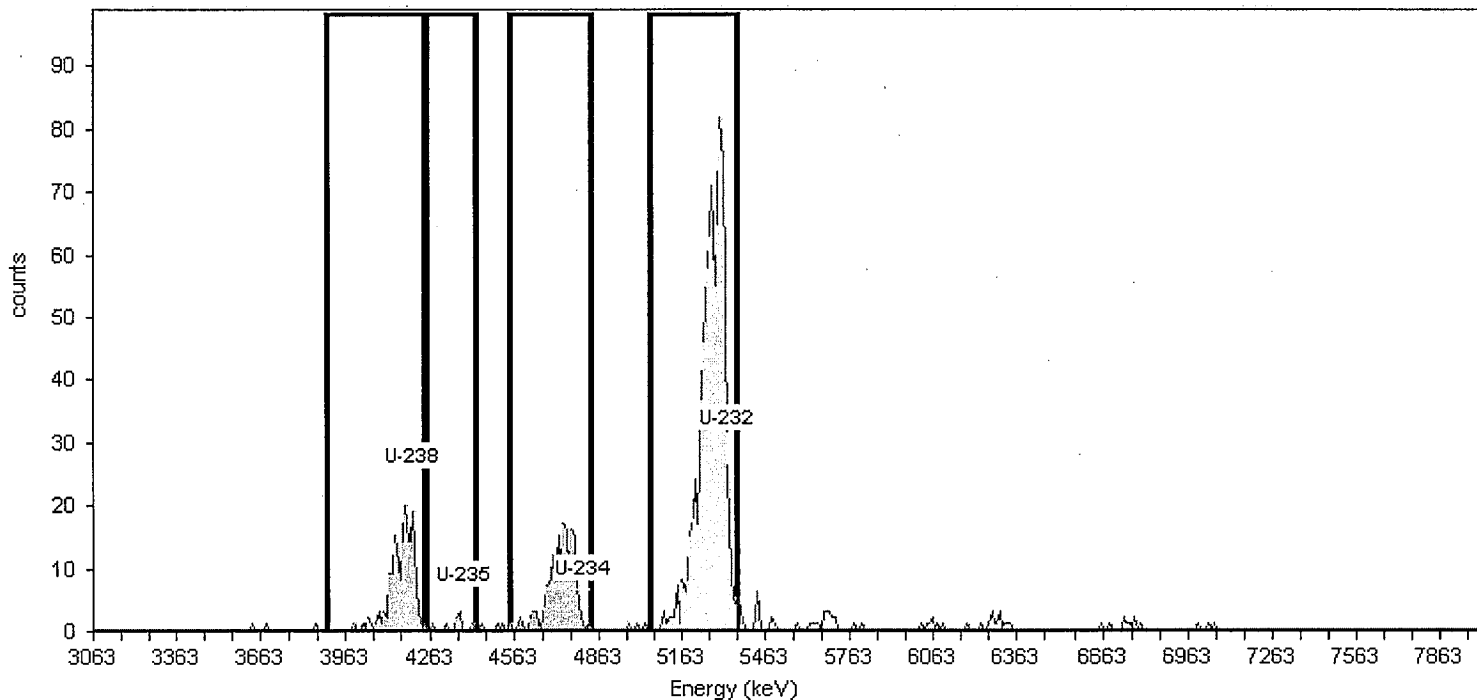
Paragon Analytics

Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-10 Spectrum #1 Analysis #1	Sample Size : 0.50
Acquisition Detector: 21 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:03AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %

Calibration Bkgd Info: Sample: B09020321; Det: 21; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:14:17PM Efficiency Calibration: C09020321 Efficiency: 29.15% +/- 0.13% TPU(2 sigma)	Energy Calibration: C09020321 Energy Cal: Gain = 9.7289 keV / Ch Offset = 3,053.57 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 87.78%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4172.4	3890.2	4240.5	101.2	100.2	161.00	0.00	161.00	1.9E+000	3.8E-001	0.0E+000	3.2E-002
U-235	4357.2	4250.2	4425.3	23.0	99.7	8.00	0.90	7.10	8.4E-002	7.1E-002	2.1E-002	7.4E-002
U-234	4775.6	4551.8	4833.9	104.7	100.0	160.00	3.30	156.70	1.8E+000	3.8E-001	4.0E-002	1.1E-001
U-232	5300.9	5048.0	5359.3	97.9	100.1	763.00	4.50	758.50	8.0E+000	5.8E-001	4.8E-002	1.3E-001

Reviewed By: *EMF* *JP*

Print Date: 2/6/2009 3:19:17PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

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Paragon Analytics

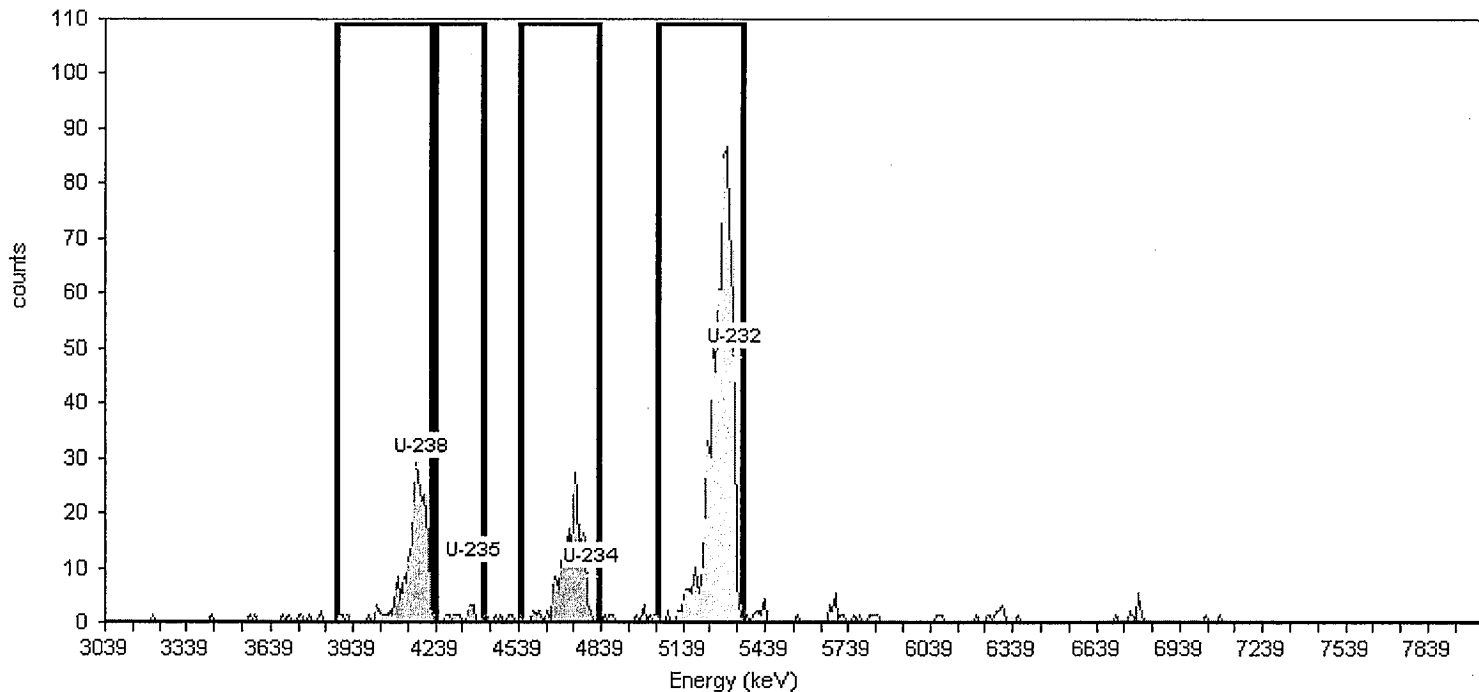
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-11 Spectrum #1 Analysis #1	Sample Size : 0.50
--	--------------------

Acquisition Detector: 22 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:04AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020322; Det: 22; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:14:39PM Efficiency Calibration: C09020322 Efficiency: 28.13% +/- 0.15% TPU(2 sigma)	Energy Calibration: C09020322 Energy Cal: Gain = 9.8224 keV / Ch Offset = 3,029.39 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 86.63%
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Nuclide Summary (ROI)												
	Peak Energy	ROI	ROI							2.00Sigma	Critical	
Nuclide	keV	Start	End	FWHM	B.R.	Gross	Bkgd	Net	Activity	TPU	Level	MDA
		keV	keV	keV	%	Counts	Counts	Counts	pCi/g	pCi/g	pCi/g	pCi/g
U-238	4159.0	3874.1	4227.7	73.2	100.2	212.00	0.90	211.10	2.6E+000	4.8E-001	2.2E-002	7.7E-002
U-235	4345.6	4237.6	4414.4	24.5	99.7	13.00	0.00	13.00	1.6E-001	9.5E-002	0.0E+000	3.3E-002
U-234	4768.0	4542.0	4826.9	80.8	100.0	191.00	1.50	189.50	2.3E+000	4.5E-001	2.8E-002	9.0E-002
U-232	5298.4	5043.0	5357.3	84.2	100.1	726.00	3.60	722.40	7.8E+000	5.9E-001	4.5E-002	1.2E-001

Reviewed By: *EMF* *JP*

Print Date: 2/6/2009 3:19:30PM

Paragon Analytics

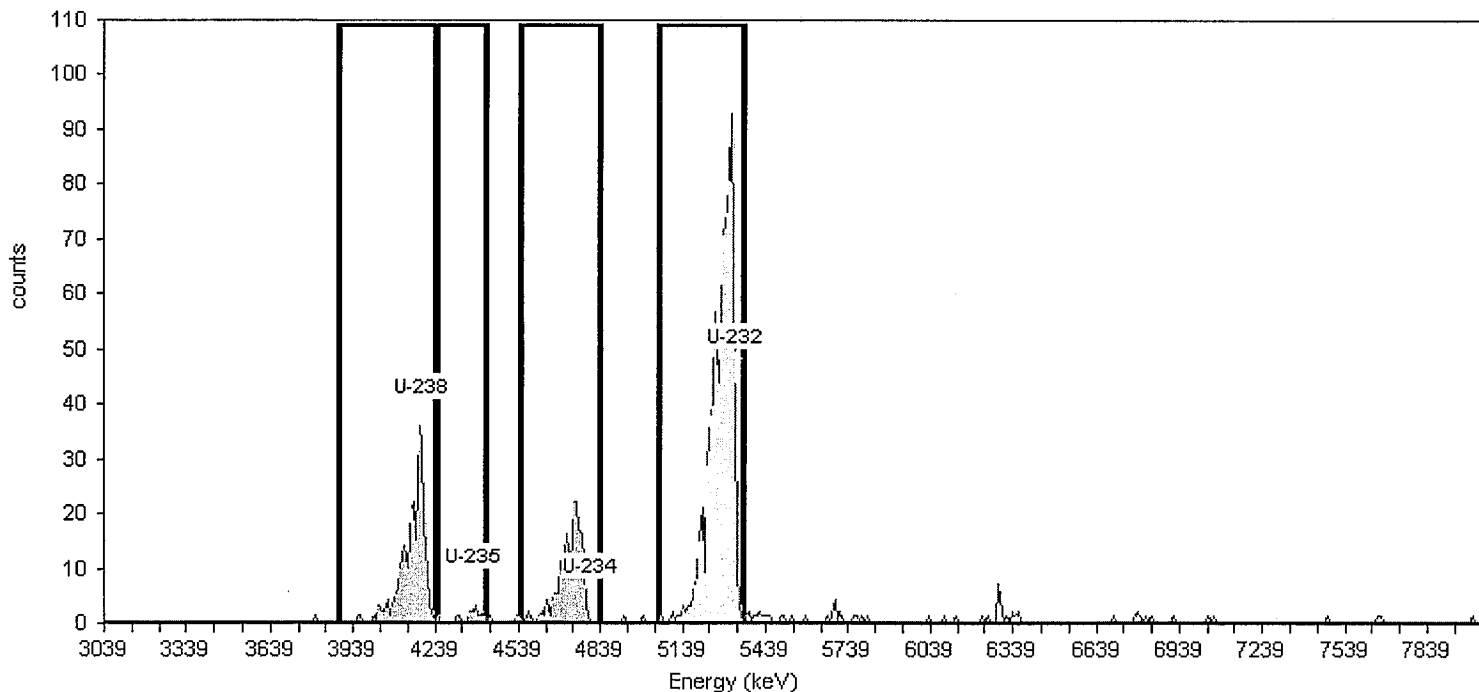
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-12 Spectrum #1 Analysis #1	Sample Size : 0.50
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Acquisition Detector: 23 Batch Name: UAS090129-1_A Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/4/2009 9:26:05AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020323; Det: 23; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:15:01PM Efficiency Calibration: C09020323 Efficiency: 29.14% +/- 0.18% TPU(2 sigma)	Energy Calibration: C09020323 Energy Cal: Gain = 9.8224 keV / Ch Offset = 3,029.39 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 82.01%
--	--



Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4188.4	3883.9	4237.6	23.2	100.2	234.00	0.60	233.40	2.9E+000	5.3E-001	1.8E-002	7.0E-002
U-235	4375.1	4247.4	4424.2	52.7	99.7	14.00	0.00	14.00	1.8E-001	1.0E-001	0.0E+000	3.4E-002
U-234	4797.4	4542.0	4836.7	79.6	100.0	176.00	1.80	174.20	2.2E+000	4.3E-001	3.2E-002	9.7E-002
U-232	5327.8	5052.8	5357.3	82.4	100.1	711.00	2.70	708.30	7.4E+000	5.6E-001	3.9E-002	1.1E-001

Reviewed By: *SMF* *JP*

Print Date: 2/6/2009 3:20:22PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

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Paragon Analytics

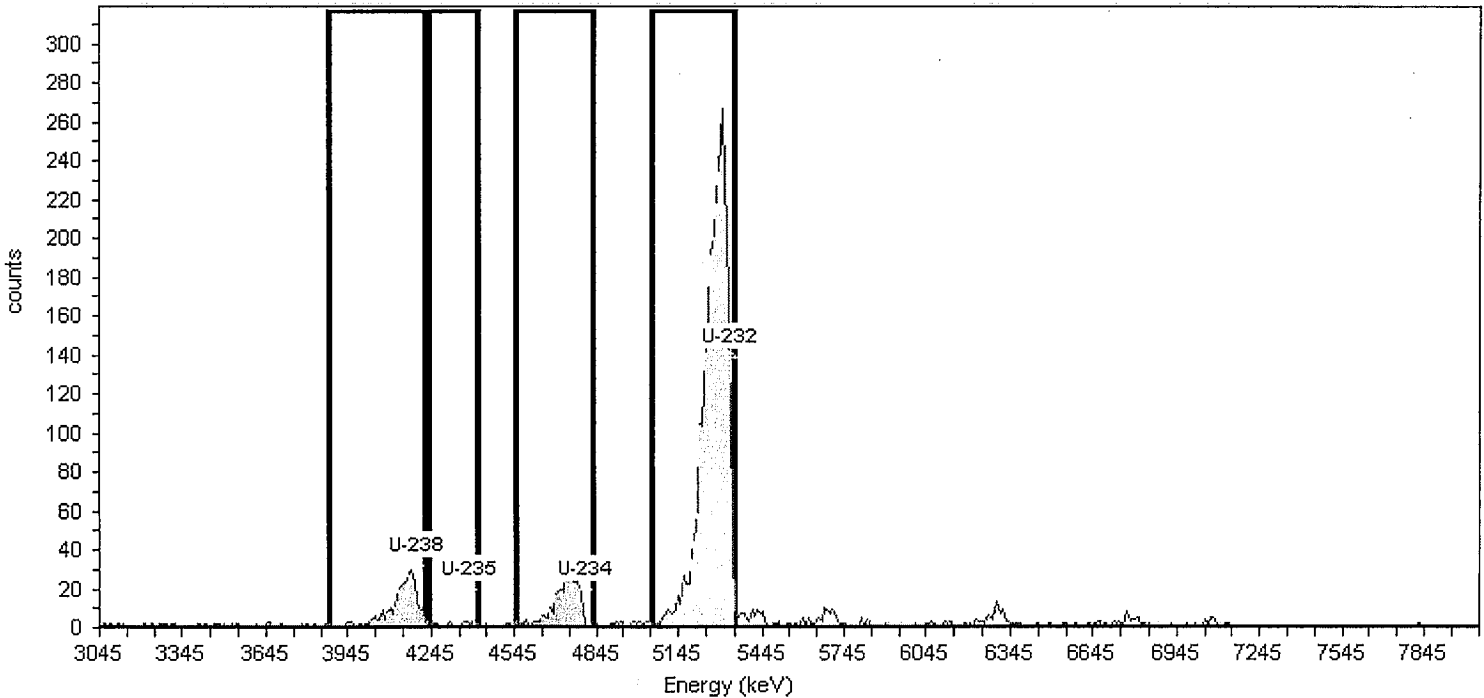
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-13 Spectrum #1 Analysis #1	Sample Size : 0.25
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Acquisition Detector: 25 Batch Name: UAS090129-1_D Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/10/2009 2:05:29PM Live Time: 1,000.00 min. Real Time: 1,000.43 min. Dead Time: 0.04 %
---	--

Calibration Bkgd Info: Sample: B09020425; Det: 25; Spectrum #1; Feb-04-2009 15:21 Calibration Date: 2/4/2009 3:06:25PM Efficiency Calibration: C09020425 Efficiency: 29.10% +/- 0.20% TPU(2 sigma)	Energy Calibration: C09020425 Energy Cal: Gain = 9.8047 keV / Ch Offset = 3,036.00 keV Quadratic = 0.0000 keV / Ch ²
---	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 86.20%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4193.0	3869.4	4222.4	30.4	100.2	263.00	8.00	255.00	1.8E+000	3.1E-001	4.7E-002	1.1E-001
U-235	4379.3	4232.2	4408.7	36.7	99.7	13.00	4.00	9.00	6.5E-002	6.0E-002	3.4E-002	8.7E-002
U-234	4800.9	4545.9	4830.3	94.0	100.0	273.00	7.00	266.00	1.9E+000	3.2E-001	4.4E-002	1.1E-001
U-232	5330.3	5046.0	5349.9	98.1	100.1	2,498.00	20.00	2,478.00	1.6E+001	6.4E-001	7.6E-002	1.7E-001

Reviewed By: *QMF* *JP*

Paragon Analytics

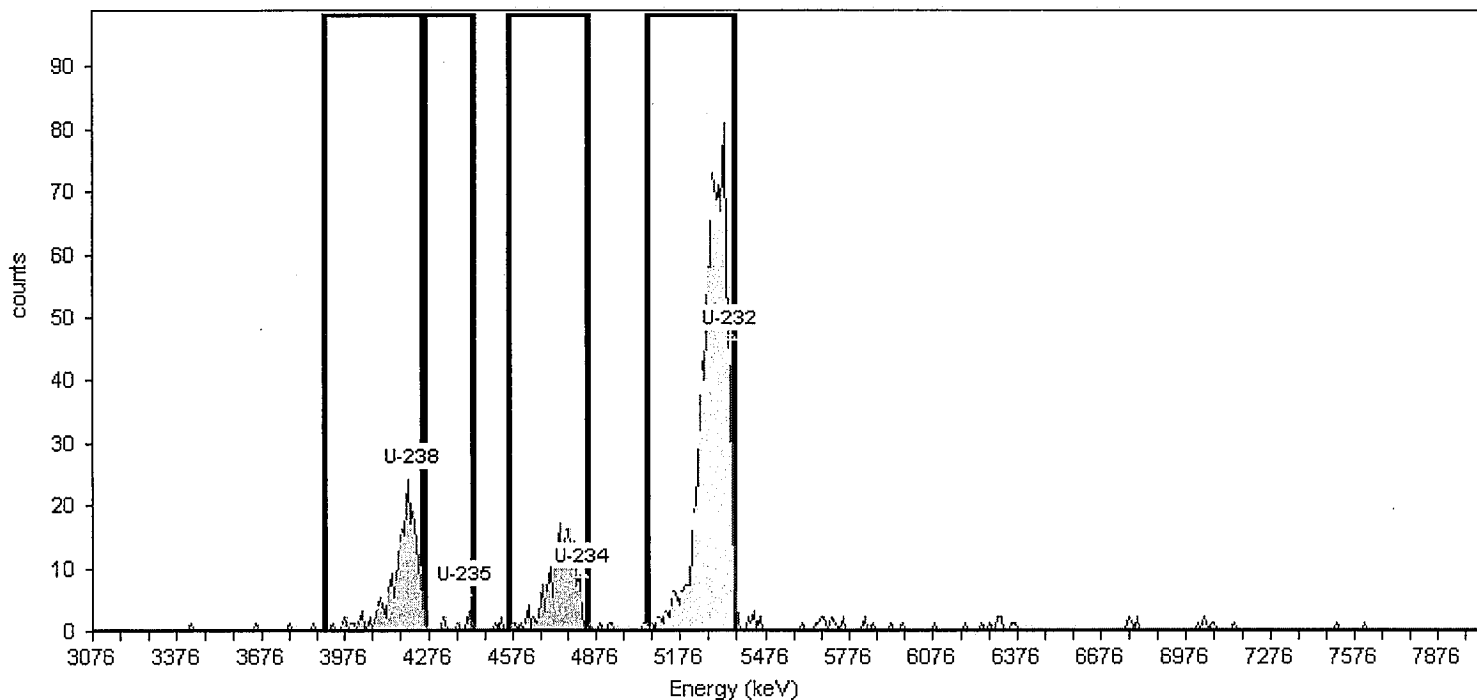
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-14 Spectrum #1 Analysis #1	Sample Size : 0.50
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Acquisition Detector: 11 Batch Name: UAS090129-1_C Nuclide Library: Uranium Default Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default ROI Set: Uranium Default	Acquisition Start Date: 2/9/2009 8:55:29PM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020311; Det: 11; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:32:26AM Efficiency Calibration: C09020311 Efficiency: 31.58% +/- 0.16% TPU(2 sigma)	Energy Calibration: C09020311 Energy Cal: Gain = 9.7450 keV / Ch Offset = 3,066.77 keV Quadratic = 0.0000 keV / Ch ²
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Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 86.71%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4179.0	3896.4	4247.2	89.1	100.2	189.46	0.04	189.42	2.1E+000	3.9E-001	4.1E-003	3.8E-002
U-235	4364.2	4257.0	4432.4	111.5	99.7	7.73	0.30	7.43	8.2E-002	6.3E-002	1.1E-002	5.2E-002
U-234	4783.2	4559.1	4841.7	101.9	100.0	170.27	0.30	169.97	1.9E+000	3.7E-001	1.1E-002	5.2E-002
U-232	5309.4	5056.1	5367.9	442.5	100.1	812.92	1.16	811.76	7.9E+000	5.5E-001	2.3E-002	7.5E-002

Reviewed By: *EMF* *JP*

Print Date: 2/10/2009 9:09:53AM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

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Paragon Analytics

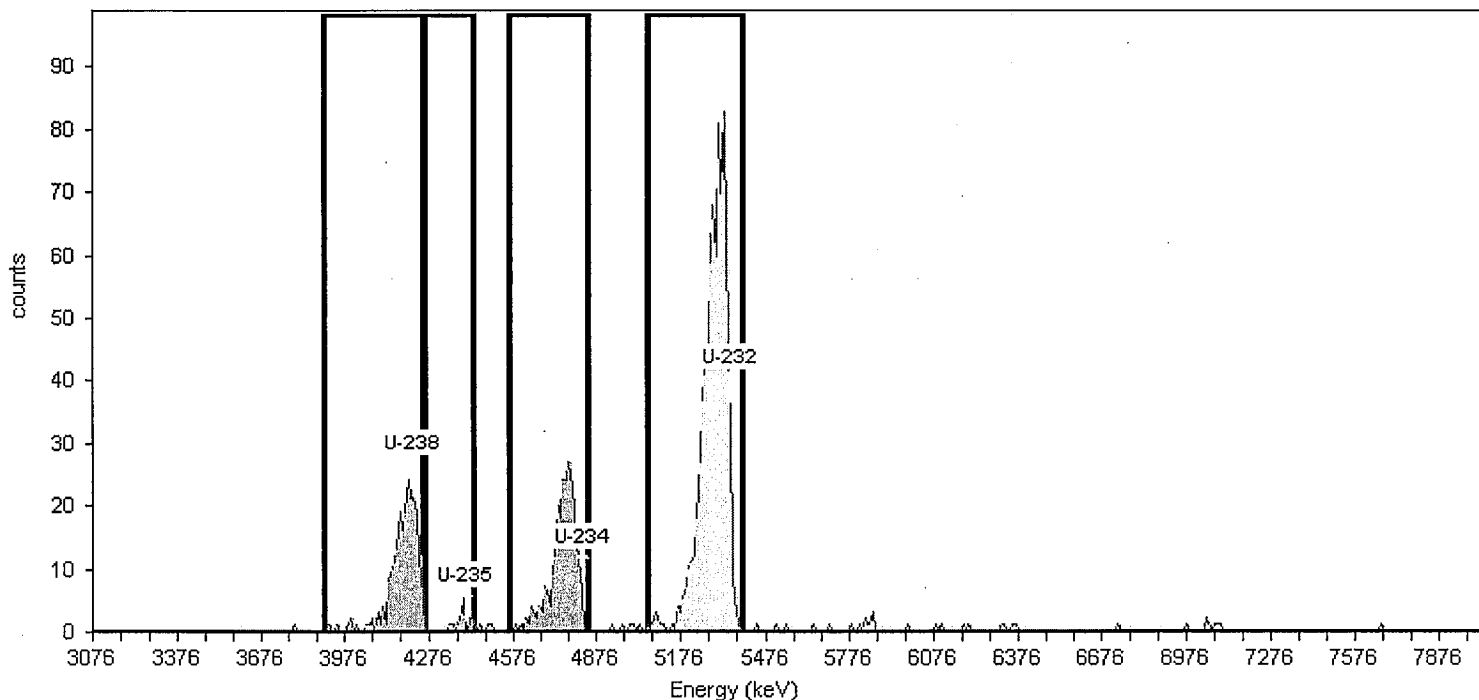
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-15 Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 11 Batch Name: UAS090129-1_B Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/6/2009 9:01:52AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020311; Det: 11; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:32:26AM Efficiency Calibration: C09020311 Efficiency: 31.58% +/- 0.16% TPU(2 sigma)	Energy Calibration: C09020311 Energy Cal: Gain = 9.7450 keV / Ch Offset = 3,066.77 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 81.30%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4216.7	3895.1	4245.9	47.7	100.2	217.00	0.30	216.70	1.3E+000	2.3E-001	6.0E-003	2.8E-002
U-235	4401.8	4255.7	4431.1	51.3	99.7	16.00	0.30	15.70	9.2E-002	4.9E-002	6.0E-003	2.8E-002
U-234	4820.9	4557.8	4840.4	80.9	100.0	243.00	0.30	242.70	1.4E+000	2.5E-001	6.0E-003	2.8E-002
U-232	5347.1	5054.7	5395.8	99.9	100.1	763.00	1.80	761.20	3.7E+000	2.7E-001	1.5E-002	4.6E-002

Reviewed By:

EMF

JP

Print Date: 2/6/2009 2:59:22PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

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Paragon Analytics

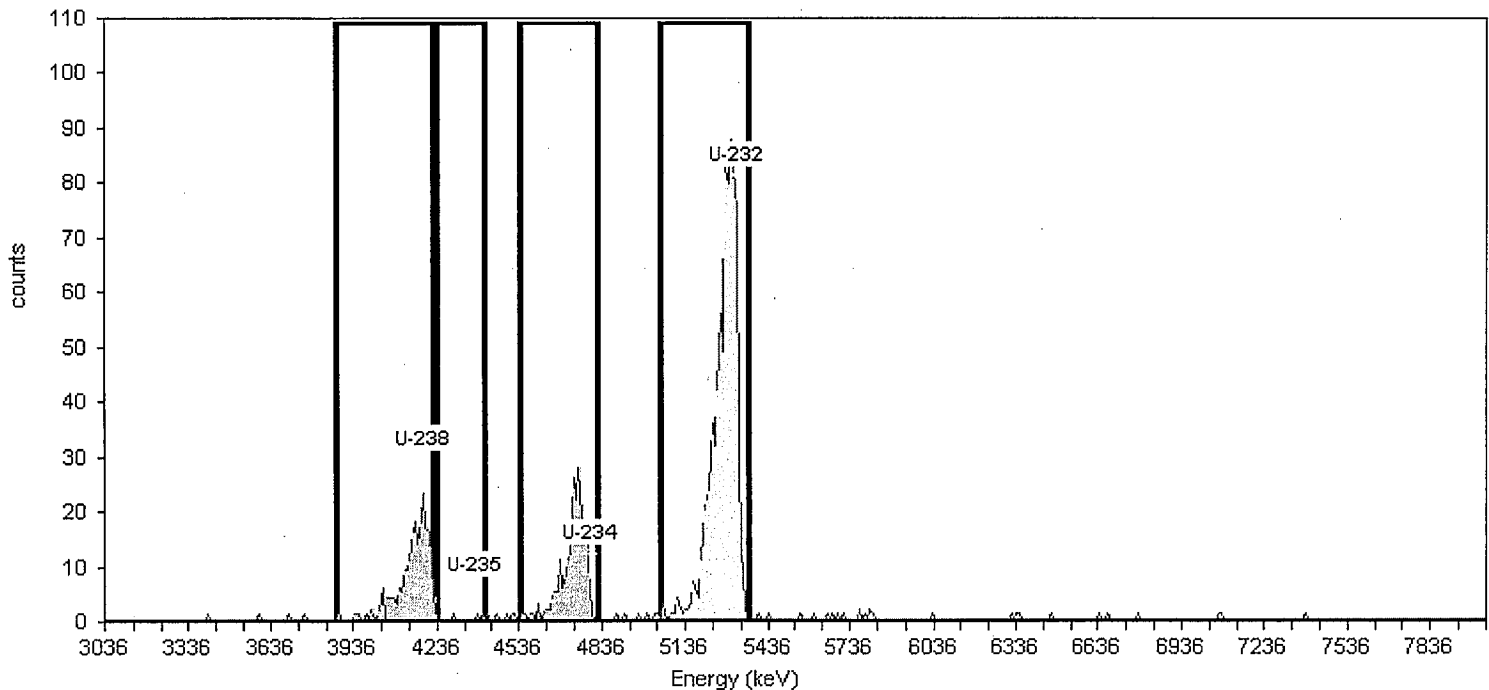
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-16 Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 13 Batch Name: UAS090129-1_B Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/6/2009 9:01:53AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020313; Det: 13; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:33:09AM Efficiency Calibration: C09020313 Efficiency: 32.25% +/- 0.13% TPU(2 sigma)	Energy Calibration: C09020313 Energy Cal: Gain = 9.8047 keV / Ch Offset = 3,026.20 keV Quadratic = 0.0000 keV / Ch ²
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Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 81.89%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4183.2	3869.4	4222.4	46.8	100.2	206.00	0.60	205.40	1.2E+000	2.2E-001	8.2E-003	3.2E-002
U-235	4369.5	4232.2	4408.7	15.8	99.7	3.00	0.00	3.00	1.7E-002	2.3E-002	0.0E+000	1.5E-002
U-234	4791.1	4536.1	4820.5	64.2	100.0	209.00	0.60	208.40	1.2E+000	2.2E-001	8.3E-003	3.2E-002
U-232	5320.5	5046.0	5369.5	55.8	100.1	784.00	1.20	782.80	3.7E+000	2.7E-001	1.2E-002	3.9E-002

Reviewed By: *Emf* *JP*

Paragon Analytics

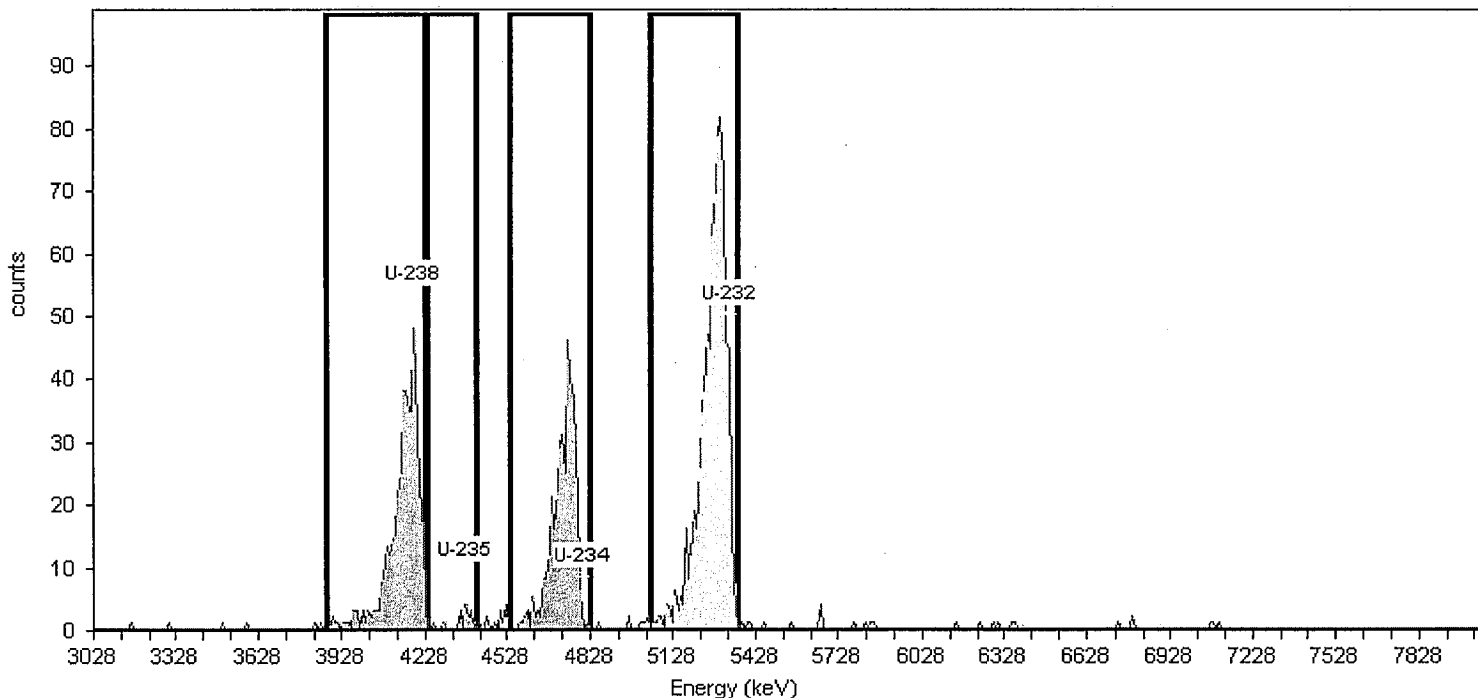
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-17 Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 14 Batch Name: UAS090129-1_B Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/6/2009 9:01:53AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020314; Det: 14; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:33:30AM Efficiency Calibration: C09020314 Efficiency: 31.00% +/- 0.15% TPU(2 sigma)	Energy Calibration: C09020314 Energy Cal: Gain = 9.8810 keV / Ch Offset = 3,018.33 keV Quadratic = 0.0000 keV / Ch ²
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Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 84.27%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4184.3	3868.1	4223.8	41.2	100.2	414.00	0.30	413.70	2.4E+000	3.7E-001	5.9E-003	2.7E-002
U-235	4372.0	4233.7	4411.5	23.7	99.7	15.00	0.60	14.40	8.3E-002	4.7E-002	8.4E-003	3.2E-002
U-234	4796.9	4540.0	4826.5	72.8	100.0	357.00	0.90	356.10	2.0E+000	3.3E-001	1.0E-002	3.6E-002
U-232	5330.5	5043.9	5360.1	52.8	100.1	776.00	1.50	774.50	3.8E+000	2.8E-001	1.3E-002	4.3E-002

Reviewed By:

SMF

JP

Print Date: 2/6/2009 3:00:34PM

AlphaVision v5.3
Custom Report Iteration: 08/09/07

Paragon Analytics

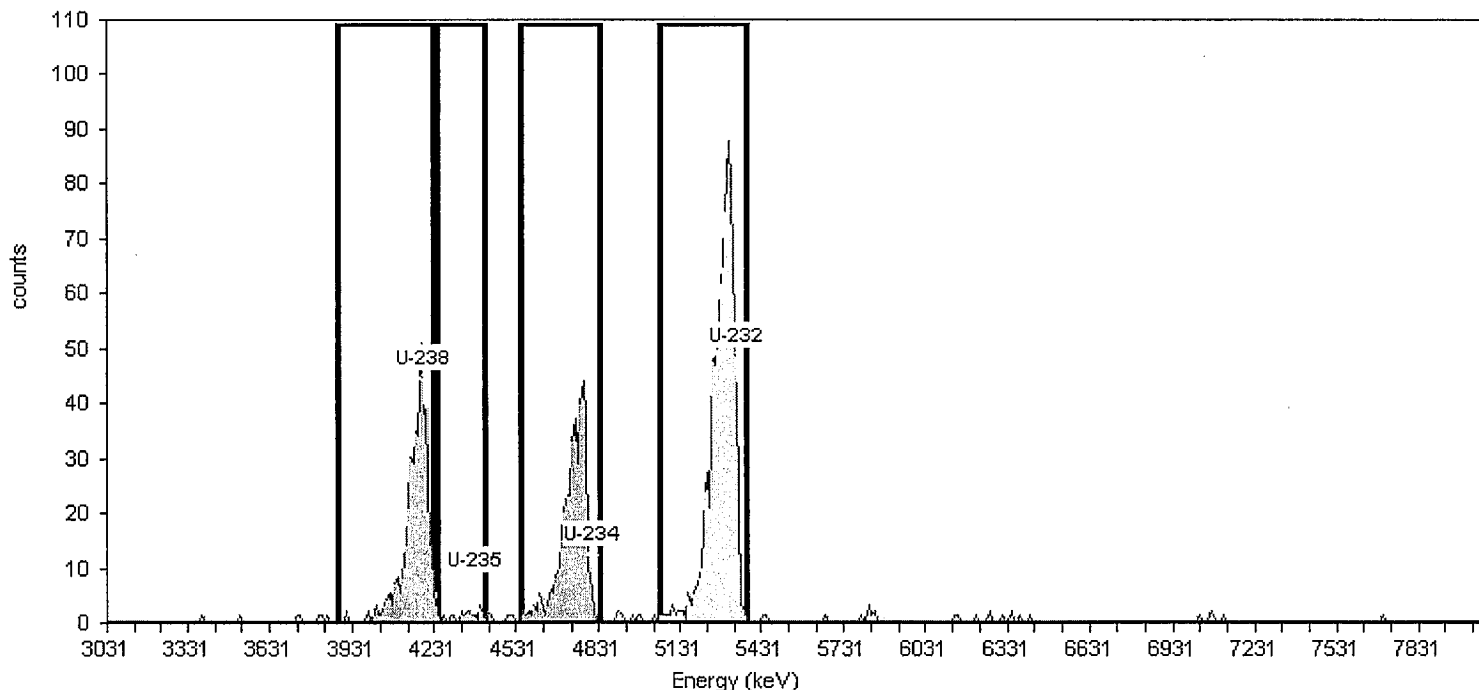
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-17D Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 16 Batch Name: UAS090129-1_B Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/6/2009 9:01:54AM Live Time: 300.00 min. Real Time: 300.01 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020316; Det: 16; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 10:33:53AM Efficiency Calibration: C09020316 Efficiency: 30.77% +/- 0.12% TPU(2 sigma)	Energy Calibration: C09020316 Energy Cal: Gain = 9.9003 keV / Ch Offset = 3,021.28 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 84.71%
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Nuclide Summary (ROI)												
	Peak Energy	ROI Start	ROI End	FWHM	B.R.	Gross	Bkgd	Net	Activity	2.00Sigma TPU	Critical Level	MDA
Nuclide	keV	keV	keV	keV	%.	Counts	Counts	Counts	pCi/g	pCi/g	pCi/g	pCi/g
U-238	4189.5	3872.7	4229.1	35.5	100.2	376.00	0.30	375.70	2.2E+000	3.5E-001	5.9E-003	2.7E-002
U-235	4377.6	4239.0	4417.2	18.4	99.7	18.00	0.30	17.70	1.0E-001	5.1E-002	5.9E-003	2.8E-002
U-234	4803.3	4545.9	4833.0	73.4	100.0	371.00	0.60	370.40	2.1E+000	3.4E-001	8.4E-003	3.2E-002
U-232	5337.9	5050.8	5377.5	64.8	100.1	774.00	1.50	772.50	3.8E+000	2.8E-001	1.3E-002	4.3E-002

Paragon Analytics

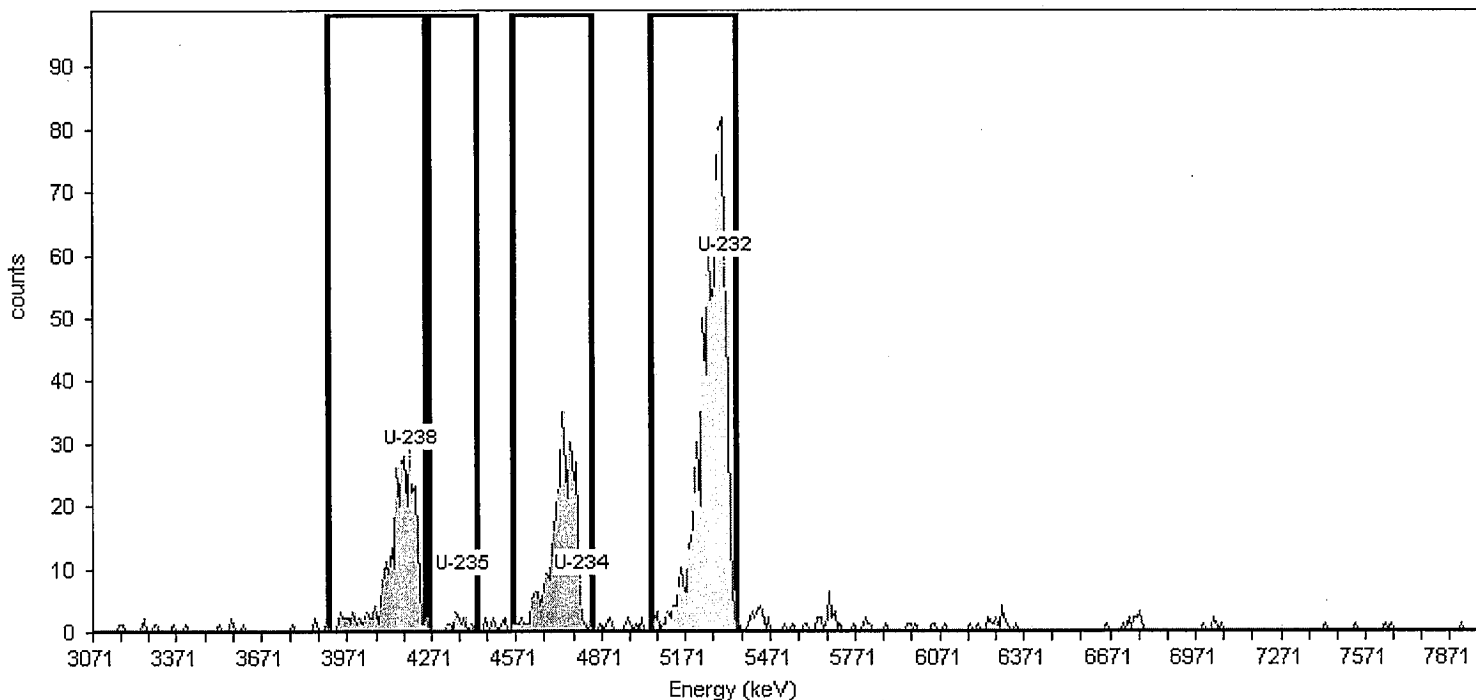
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-18 Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 17 Batch Name: UAS090129-1_B Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/6/2009 9:01:55AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020317; Det: 17; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:12:59PM Efficiency Calibration: C09020317 Efficiency: 30.93% +/- 0.20% TPU(2 sigma)	Energy Calibration: C09020317 Energy Cal: Gain = 9.6533 keV / Ch Offset = 3,061.36 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 83.90%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4200.4	3901.2	4248.7	66.3	100.2	299.00	0.90	298.10	1.7E+000	2.9E-001	1.0E-002	3.6E-002
U-235	4383.9	4258.4	4432.1	39.4	99.7	11.00	0.30	10.70	6.2E-002	4.0E-002	6.0E-003	2.8E-002
U-234	4799.0	4557.6	4837.6	86.0	100.0	298.00	1.80	296.20	1.7E+000	2.9E-001	1.5E-002	4.5E-002
U-232	5320.2	5049.9	5349.2	92.2	100.1	777.00	7.80	769.20	3.8E+000	2.8E-001	3.1E-002	7.8E-002

Paragon Analytics

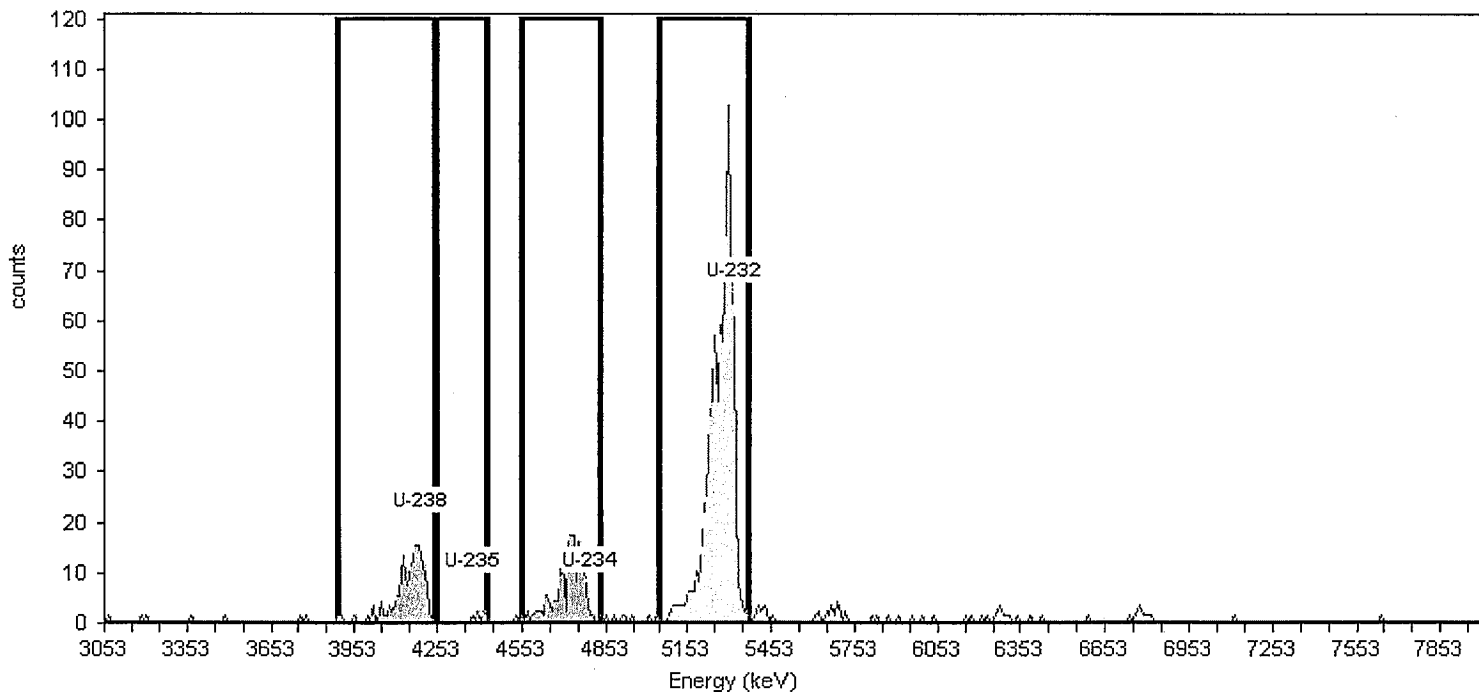
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-19 Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 18 Batch Name: UAS090129-1_B Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/6/2009 9:01:56AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020318; Det: 18; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:13:24PM Efficiency Calibration: C09020318 Efficiency: 30.42% +/- 0.15% TPU(2 sigma)	Energy Calibration: C09020318 Energy Cal: Gain = 9.7289 keV / Ch Offset = 3,043.84 keV Quadratic = 0.0000 keV / Ch ²
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Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 84.51%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4191.8	3890.2	4240.5	48.7	100.2	146.00	2.10	143.90	8.4E-001	1.8E-001	1.6E-002	4.7E-002
U-235	4376.7	4250.2	4425.3	22.4	99.7	6.00	0.00	6.00	3.5E-002	3.1E-002	0.0E+000	1.6E-002
U-234	4795.0	4551.8	4833.9	91.1	100.0	158.00	1.50	156.50	9.1E-001	1.9E-001	1.3E-002	4.3E-002
U-232	5320.4	5048.0	5369.0	66.5	100.1	772.00	9.90	762.10	3.8E+000	2.8E-001	3.5E-002	8.6E-002

Paragon Analytics

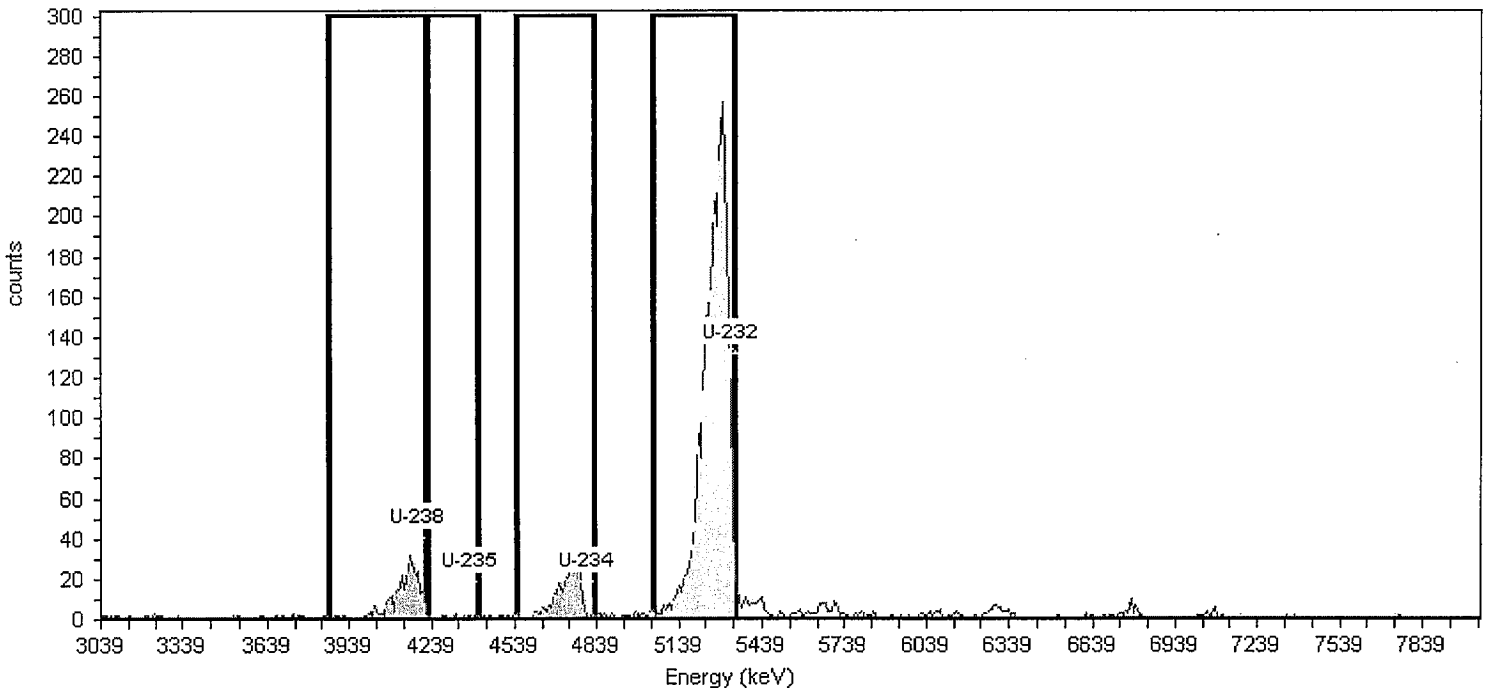
Alpha-Spectroscopy Analysis Report

Sample Sample: 0812177-20 Spectrum #1 Analysis #1	Sample Size : 0.25
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Acquisition Detector: 26 Batch Name: UAS090129-1_D Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/10/2009 2:05:30PM Live Time: 1,000.00 min. Real Time: 1,000.43 min. Dead Time: 0.04 %
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Calibration Bkgd Info: Sample: B09020426; Det: 26; Spectrum #1; Feb-04-2009 15:21 Calibration Date: 2/4/2009 3:06:53PM Efficiency Calibration: C09020426 Efficiency: 30.59% +/- 0.15% TPU(2 sigma)	Energy Calibration: C09020426 Energy Cal: Gain = 9.8224 keV / Ch Offset = 3,029.39 keV Quadratic = 0.0000 keV / Ch ²
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Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 81.44%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4188.4	3864.3	4217.9	39.3	100.2	267.00	6.00	261.00	1.9E+000	3.1E-001	4.1E-002	1.0E-001
U-235	4375.1	4227.7	4404.5	48.5	99.7	9.00	2.00	7.00	5.1E-002	4.8E-002	2.4E-002	6.7E-002
U-234	4797.4	4542.0	4826.9	96.0	100.0	253.00	18.00	235.00	1.7E+000	3.0E-001	7.1E-002	1.6E-001
U-232	5327.8	5043.0	5347.5	403.4	100.1	2,486.00	25.00	2,461.00	1.5E+001	6.1E-001	8.6E-002	1.9E-001

Reviewed By: *[Signature]* *[Signature]*

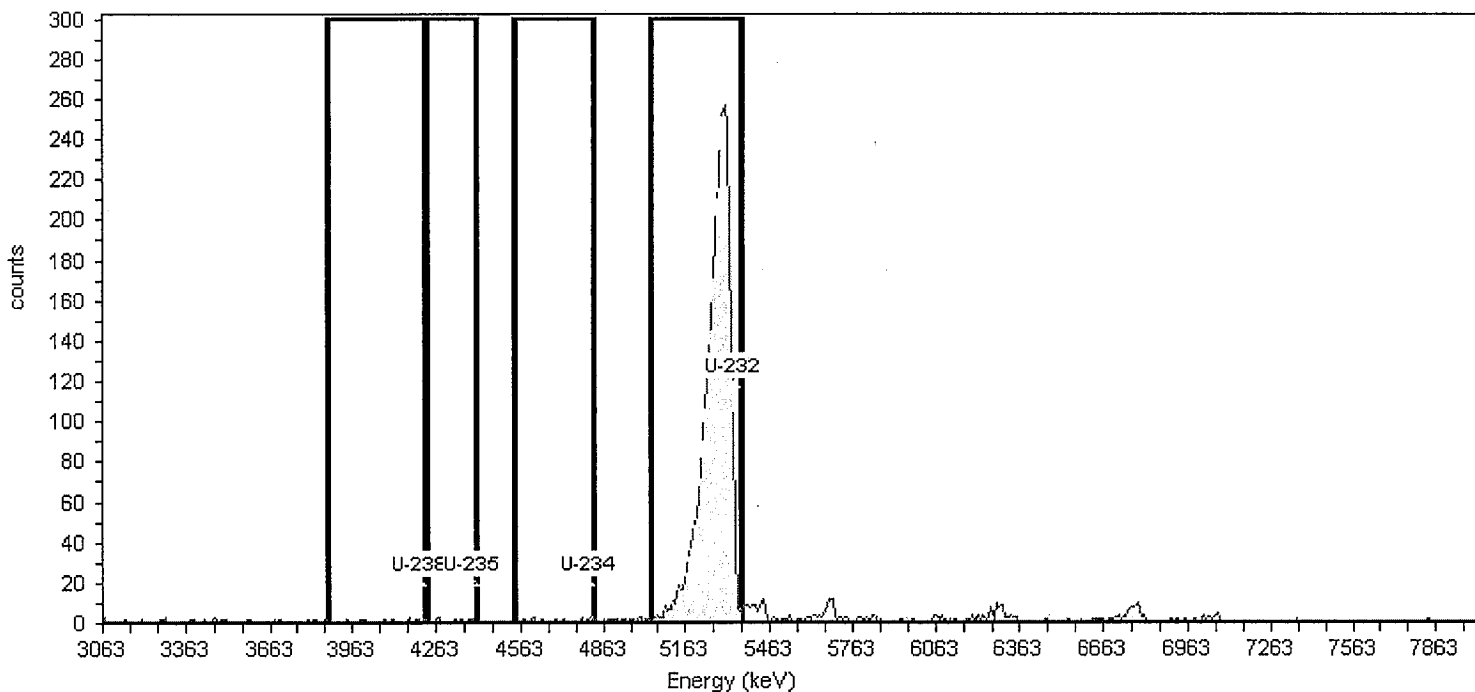
Paragon Analytics

Alpha-Spectroscopy Analysis Report

Sample Sample: AS090129-1MB Spectrum #1 Analysis #1	Sample Size : 0.25 0.25 0.8 <i>EMP 2/10/09</i>
Acquisition Detector: 27 Batch Name: UAS090129-1_D Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/10/2009 2:05:30PM Live Time: 1,000.00 min. Real Time: 1,000.43 min. Dead Time: 0.04 %

Calibration Bkgd Info: Sample: B09020427; Det: 27; Spectrum #1; Feb-04-2009 15:21 Calibration Date: 2/4/2009 3:07:14PM Efficiency Calibration: C09020427 Efficiency: 29.78% +/- 0.16% TPU(2 sigma)	Energy Calibration: C09020427 Energy Cal: Gain = 9.7289 keV / Ch Offset = 3,053.57 keV Quadratic = 0.0000 keV / Ch ²
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Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 85.66%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4201.6	3870.8	4221.0	.0	100.2	11.00	9.00	2.00	1.4E-002	6.3E-002	4.9E-002	1.2E-001
U-235	4386.4	4230.8	4405.9	135.4	99.7	7.00	3.00	4.00	2.8E-002	4.5E-002	2.9E-002	7.6E-002
U-234	4804.8	4542.1	4824.2	16.9	100.0	12.00	5.00	7.00	4.9E-002	5.8E-002	3.7E-002	9.3E-002
U-232	5330.1	5038.3	5359.3	47.6	100.1	2,539.00	19.00	2,520.00	1.6E+001	6.3E-001	7.3E-002	1.7E-001

Reviewed By: *QMF*
 Print Date: 2/11/2009 9:07:43AM

AlphaVision v5.3
 Custom Report Iteration: 08/09/07

** estimates only*

Paragon Analytics

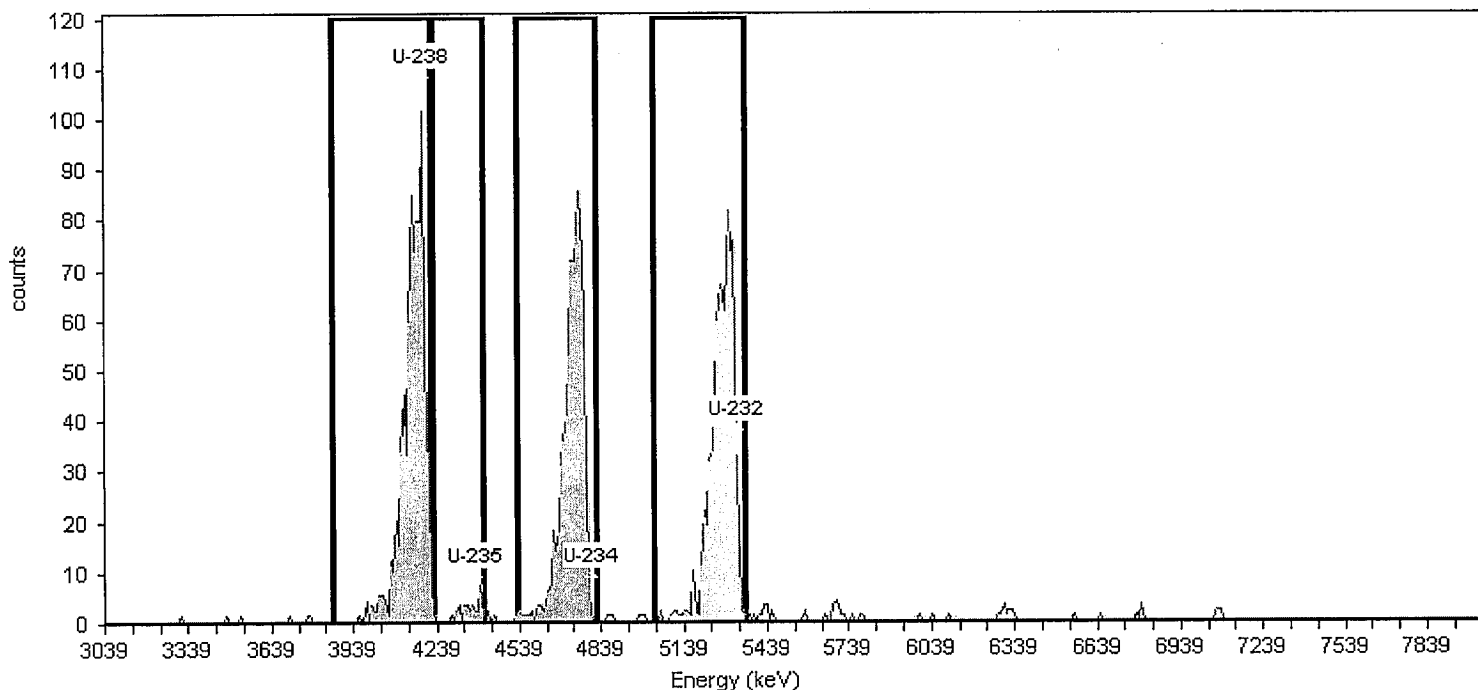
Alpha-Spectroscopy Analysis Report

Sample Sample: AS090129-1LCS Spectrum #1 Analysis #1	Sample Size : 1.00
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Acquisition Detector: 23 Batch Name: UAS090129-1_B Nuclide Library: Uranium Default Analysis Method: Absolute Interactive ROI Analysis ROI Set: Uranium Default	Acquisition Start Date: 2/6/2009 9:01:58AM Live Time: 300.00 min. Real Time: 300.00 min. Dead Time: 0.00 %
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Calibration Bkgd Info: Sample: B09020323; Det: 23; Spectrum #1; Feb-03-2009 14:40 Calibration Date: 2/3/2009 12:15:01PM Efficiency Calibration: C09020323 Efficiency: 29.14% +/- 0.18% TPU(2 sigma)	Energy Calibration: C09020323 Energy Cal: Gain = 9.8224 keV / Ch Offset = 3,029.39 keV Quadratic = 0.0000 keV / Ch ²
--	--

Tracer Tracer Name: 837.3610.11 U-232 Tracer Activity: 20.12 DPM/mL x (Vol.)0.50 mL = 10.06 DPM	Tracer Nuclide: U-232 Tracer Recovery: 83.40%
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Nuclide Summary (ROI)												
Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4188.4	3864.3	4217.9	42.2	100.2	765.00	0.60	764.40	4.7E+000	6.8E-001	9.0E-003	3.5E-002
U-235	4375.1	4227.7	4404.5	16.7	99.7	30.00	0.00	30.00	1.9E-001	7.3E-002	0.0E+000	1.7E-002
U-234	4797.4	4532.2	4817.1	74.0	100.0	707.00	2.10	704.90	4.4E+000	6.4E-001	1.7E-002	5.0E-002
U-232	5327.8	5033.2	5357.3	45.6	100.1	723.00	2.70	720.30	3.8E+000	2.8E-001	1.9E-002	5.6E-002

Reviewed By: *EMF* *JP*

ALS - Fort Collins

Alpha Spectrometer Instrument Run Log

374263

Date: 2/4

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
9	UAS090129-1-A	0812177-1	V/S	300	EMF
10		2			
11		2D			
12		3			
13		4			
14		5			
16		6			
17		7			
18		8			
19		9			
21		10			
22		11			
23		12			
24		13			
1	NAS090202-3-B	0901046-9	Np/W	300	
2		9SYS			
3		AS090202-3SYS			
4		MB			
5		16S			
6	PAS090128-6-C	0812102-14	Pu/S	300	
7		15			
8		16			
49		17			
50		AS090128-6-B			

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
57	PAS090128-6-C	AS090128-6MB	Pu/S	300	EMF
52	AS090128-6-A	0812102-1	Am/S	300	
54		2			
55		3			
56		4			
16	UAS090130-1-A	0812178-1	V/S	300	EMF
17		2			
18		3			
19		SD			
21		4			
22		5			
23		6			
24		7			
11	UAS090202-4-A	0901046-9	V/W	120	EMF
12		9D			
13		AS090202-4MB			
14		AS090202-4US			
1	PL0901272-C	0901097-1	Pu/W	300	
2	PAS090128-6-B	0812102-5	Am/S	300	
3		SD			
4		6			
5		7			
6		8			
7		9			

Notes:

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374263

Reviewed by: EMF
Date: 2/5/09

ALS - Fort Collins

Alpha Spectrometer Instrument Run Log

374269

Date: 2/4

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
9	UAS090129-1-B	0812177-14	U/S	300	EMF
11		15			
13		16			
14		17			
16		17D			
17		18			
18		19			
21		20			
22		AS090129-1MB			
23		L LCS			
22	NAS090205-1-A	0911001-1	MP/N	300	EMF
53		2			
54		3			
55		AS090205-1MB			
9	UAS090204-3-A	0901261-4	U/S	180	EMF
10		L 4D			
11		0901262-2			
12		L 2D			
13		0901283-3			
14		AS090204-3MB			
16		L LCS			
17	UAS090202-2-D	AS090202-7MB	V/W	1000	
18	TA5090204-2-A	0901261-4			
19		L 1D			
21	TA5090204-2-A	0901262-2	Th/S	180	EMF
22		L 2D			
23		0901283-3			
24		AS090204-2MB			
25		L LCS			
1	NAS090204-1-A	0901261-4	MP/S	180	
2		L 4SYS			
3		0901262-2			
4		L 2SYS			
5		L 2D			
6		EMF 0901283-3			
7		L 2SYS			
8		L 2D			
49		AS090204-1SYS			
50		AS090204-1MB			
51		AS090204-1LCS			
EMF 2/1/09					

Notes:

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374269

 Reviewed by: Zmk
 Date: 2/1/09

374273

ALS - Fort Collins Alpha Spectrometer Instrument Run Log

Date: 2/9

ORM 7468.xls (10/2/07)

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
36	0901090-6SVS	NAS090204-4-A	Np/W	180	EMF
37	11				
39	11SVS				
40	12				
42	12SVS				
43	13				
45	13SVS				
46	AS090204-4-A				
47	AS090204-4-A				
1	PAS090127-3-B	0901190-4	Pu/S	1000	EMF
2					
3					
4		AS090127-3MB			
5					
6					
7					
8	NAS090204-4-B	AS090204-4-LCS	Np/W	180	
49	PAS090204-4-A	0901089-1	Am/W	300	
50					
51					
52		0901090-6			
54					
55					
56					

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
33	NAS090204-4-A	0901090-13	Am/W	300	EMF
34		AS090204-4-LCS			
35					
36	AS090128-6-D	0812102-7	Am/S	300	
37	UAS090203-1-B	0901018-18	U/S	600	EMF
38					
39					
40					
41					
42					
43					
9	TPAS090128-3-B	AS090128-3-LCS	Th/W	450	
10	UAS090227-2-C	AS090127-2-SB1	U/S	600	
11	UAS09129-1-C	0812177-14	U/S	300	
12	UAS090130-1-E	0812178-18	U/S	300	
13	UAS090204-5-B	AS090204-5-LCS	U/W	300	
14	UAS090206-1-A	0901125-1	U/S	600	
16					
17					
18					
19					
21					
22					
23					

Notes: * Sample ID and Batch ID switched.

Reviewed by: SMF
Date: 2/9

ALS - Fort Collins Alpha Spectrometer Instrument Run Log

374275

Date: 2/10

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
25	UAS090129-1-D	6812177-13	U/S	1000	2MF
26		↓ 20			
27		AS090129-1MB	↓	↓	↓
28	UAS090209-9-A	0901110-13	U/S	150	
29		↓ 15			
30		AS090209-9MB	↓	↓	↓
31		↓ 63			
32		↓ 630			
33	PA090209-9-A	0901110-13	PW/S	1000	
34		↓ 15			
35		AS090209-9MB	↓	↓	↓
36		↓ 63			
37		↓ 630			
40	NA090205-1-B	AS090205-1MB	Np/W	300	↓
57	UAS090203-1-C	0901018-5	U/S	600	2MF
58		7			
59		12			
60		120			
61		↓ 15			
62	UAS090204-5-C	0901089-7	U/W	300	
63	UAS090204-1-B	0901126-10	U/S	600	
64	UAS0909-9-B	0901110-15	U/S	300120	
		5MF			
		2/10/09			
		EMF 2/10/09			

Notes:

Reviewed by 2MF
Date: 2/10/09



Section 6

QUALITY ASSURANCE SUMMARY REPORTS

6



No *NON-CONFORMANCE REPORTS* or *QUALITY ASSURANCE SUMMARY SHEETS* are included in this data package.



Section 7

LABORATORY BENCH SHEETS



Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: AS090129-1

Prep Procedure: UIISO

Analytical QASS / NCR? Y / N N/A

Prep Num	Labid	QC Type	Init Aliq	Fin Aliq	Units	Report Units	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	0812177-1	SMP	1.0229	1.0229	g	pCl/g	_C1771	9	GMF	_C1774			_C1771			A
1	0812177-2	SMP	1.0164	1.0164	g	pCl/g	_C1772	10		_C1772			_C1772			
1	0812177-2	DUP	1.0243	1.0243	g	pCl/g	_C1772D	11		_C1772D			_C1772D			
1	0812177-3	SMP	1.0132	1.0132	g	pCl/g	_C1773	12		_C1773			_C1773			
1	0812177-4	SMP	1.0102	1.0102	g	pCl/g	_C1774	13		_C1774			_C1774			
1	0812177-5	SMP	1.016	1.016	g	pCl/g	_C1775	14		_C1775			_C1775			
1	0812177-6	SMP	1.0027	1.0027	g	pCl/g	_C1776	16		_C1776			_C1776			
1	0812177-7	SMP	1.012	1.012	g	pCl/g	_C1777	17		_C1777			_C1777			
1	0812177-8	SMP	0.5071	0.5071	g	pCl/g	_C1778	18		_C1778			_C1778			
1	0812177-9	SMP	1.0086	1.0086	g	pCl/g	_C1779	19		_C1779			_C1779			
1	0812177-10	SMP	0.514	0.514	g	pCl/g	_C17710	21		_C17710			_C17710			
1	0812177-11	SMP	0.5013	0.5013	g	pCl/g	_C17711	22		_C17711			_C17711			
1	0812177-12	SMP	0.5077	0.5077	g	pCl/g	_C17712	23		_C17712			_C17712			GMF 2/11/09
1	0812177-13	SMP	0.2618	0.2618	g	pCl/g	_C17713	24		_C17713			_C17713			LD MOC
1	0812177-14	SMP	0.5002	0.5002	g	pCl/g	_C17714	25	GMF	_C17714			_C17714			BC FWHM
1	0812177-15	SMP	1.0145	1.0145	g	pCl/g	_C17715	12	11	_C17715			_C17715			
1	0812177-16	SMP	1.0031	1.0031	g	pCl/g	_C17716	13	13	_C17716			_C17716			
1	0812177-17	SMP	1.0088	1.0088	g	pCl/g	_C17717	14	14	_C17717			_C17717			
1	0812177-17	DUP	1.0239	1.0239	g	pCl/g	_C17717D	16	14	_C17717D			_C17717D			
1	0812177-18	SMP	1.0299	1.0299	g	pCl/g	_C17718	17	17	_C17718			_C17718			
1	0812177-19	SMP	1.0164	1.0164	g	pCl/g	_C17719	18	18	_C17719			_C17719			
1	0812177-20	SMP	0.2518	0.2518	g	pCl/g	_C17720	19	21	_C17720			_C17720			
1	AS090129-1	MB	0.8303	0.8303	g	pCl/g	_1291B	22	22	_1291B			_1291B			D MOC
1	AS090129-1	LCS	0.8303	0.8303	g	pCl/g	_1291L	23	23	_1291L			_1291L			↓ longest count time

Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: AS090129-1

Prep Procedure: UIISO

Analytical QASS / NCR? Y / N NA

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Cnt 1 Instr/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Instr/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Instr/Det	Cnt 3 Pos Chk By	Notes
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Tracer/Carrier Solution Information															
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID							
T1	U-232	837.3610.11	20.070	DPM/ml	01/29/09	0.5	ml	AW016							

Spike Solution Information															
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID							
S1	U-234	644.3610.02	19.272	DPM/ml	01/29/09	0.5	ml	AW016							
S1	U-235	644.3610.02	0.921	DPM/ml	01/29/09	0.5	ml	AW016							
S1	U-238	644.3610.02	20.008	DPM/ml	01/29/09	0.5	ml	AW016							

Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: AS090129-1

Reporting Units

LabID:	TstGrpName:	RptUnits:
0812177-1	IsoU	pCi/g
0812177-2	IsoU	pCi/g
0812177-3	IsoU	pCi/g
0812177-4	IsoU	pCi/g
0812177-5	IsoU	pCi/g
0812177-6	IsoU	pCi/g
0812177-7	IsoU	pCi/g
0812177-8	IsoU	pCi/g
0812177-9	IsoU	pCi/g
0812177-10	IsoU	pCi/g
0812177-11	IsoU	pCi/g
0812177-12	IsoU	pCi/g
0812177-13	IsoU	pCi/g
0812177-14	IsoU	pCi/g
0812177-15	IsoU	pCi/g
0812177-16	IsoU	pCi/g
0812177-17	IsoU	pCi/g
0812177-18	IsoU	pCi/g
0812177-19	IsoU	pCi/g
0812177-20	IsoU	pCi/g

Sample Barcodes











0812177-1 AS090129-1PS1		0812177-2 AS090129-1PS2	
0812177-2DUP AS090129-1PS3		0812177-3 AS090129-1PS4	
0812177-4 AS090129-1PS5		0812177-5 AS090129-1PS6	
0812177-6 AS090129-1PS7		0812177-7 AS090129-1PS8	
0812177-8 AS090129-1PS9		0812177-9 AS090129-1PS10	
0812177-10 AS090129-1PS11		0812177-11 AS090129-1PS12	
0812177-12 AS090129-1PS13		0812177-13 AS090129-1PS14	

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Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: AS090129-1

0812177-14 AS090129-1PS15		0812177-15 AS090129-1PS16	
0812177-16 AS090129-1PS17		0812177-17 AS090129-1PS18	
0812177-17DUP AS090129-1PS19		0812177-18 AS090129-1PS20	
0812177-19 AS090129-1PS21		0812177-20 AS090129-1PS22	
AS090129-1MB AS090129-1PS23		AS090129-1LCS AS090129-1PS24	

Radiochemistry Prep Worksheet

Prep Batch: AS090129-1

ALS Paragon

Prep Procedure: UIISO

Reviewed By: cas Review Date: 2/3/2009

Non-Routine Pre-Treatment? Y (N) Batch: N/A Re-Prep? Y (N) Batch: N/A Prep QASS / NCR? Y (N) N/A

Prep Analyst: Crystal Shaeffer Balance: 27
 Prep Date: 1/29/2009 Balance:
 Prep Dept: AP

Prep SOP: PAI 778 Rev: 12
 Prep SOP: NONE
 Matrix Class: solid

Samp Prep Num	LabID	QC Type	Dish No.	Init Aliq g	Fin Aliq g	Prep Basis	Micro Init	Micro Date	Standards	Prep Notes
1	0812177-1	SMP		1.0229	1.0229	Dry Weight	0.02	2/3/09	T1	
2	0812177-2	SMP		1.0164	1.0164	Dry Weight			T1	
3	0812177-2	DUP		1.0243	1.0243	Dry Weight			T1	
4	0812177-3	SMP		1.0132	1.0132	Dry Weight			T1	
5	0812177-4	SMP		1.0102	1.0102	Dry Weight			T1	
6	0812177-5	SMP		1.016	1.016	Dry Weight			T1	
7	0812177-6	SMP		1.0027	1.0027	Dry Weight			T1	
8	0812177-7	SMP		1.012	1.012	Dry Weight			T1	
9	0812177-8	SMP		0.5071	0.5071	Dry Weight			T1	
10	0812177-9	SMP		1.0086	1.0086	Dry Weight			T1	
11	0812177-10	SMP		0.514	0.514	Dry Weight			T1	
12	0812177-11	SMP		0.5013	0.5013	Dry Weight			T1	
13	0812177-12	SMP		0.5077	0.5077	Dry Weight			T1	
14	0812177-13	SMP		0.2618	0.2618	Dry Weight			T1	
15	0812177-14	SMP		0.5002	0.5002	Dry Weight			T1	
16	0812177-15	SMP		1.0145	1.0145	Dry Weight			T1	
17	0812177-16	SMP		1.0031	1.0031	Dry Weight			T1	
18	0812177-17	SMP		1.0088	1.0088	Dry Weight			T1	
19	0812177-17	DUP		1.0239	1.0239	Dry Weight			T1	
20	0812177-18	SMP		1.0299	1.0299	Dry Weight			T1	
21	0812177-19	SMP		1.0164	1.0164	Dry Weight			T1	
22	0812177-20	SMP		0.2518	0.2518	Dry Weight			T1	
23	AS090129-1	MB		0.830309	0.830309	Dry Weight			T1	
24	AS090129-1	LCS		0.830309	0.830309	Dry Weight			S1,T1	

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: AS090129-1

Prep Procedure: UIISO

Reviewed By: cas

Review Date: 2/3/2009

Non-Routine Pre-Treatment? Y / (N) Batch: N/A

Batch: N/A

Prep QASS / NCR? Y / (N) N/A

Prep SOP: PAI 778 Rev: 12

Prep Analyst: Crystal Shaeffer

Balance: 27

Prep SOP: NONE

Prep Date: 1/29/2009

Balance:

Matrix Class: solid

Prep Dept: AP

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Micro Init	Micro Date	Standards	Prep Notes

Comments

Due to a possible matrix interference, all samples were prepped at a reduced aliquot of ~1 g. Due to the high activity detected in prescreen, samples 0812177-8, -10, -11, -12, and -14 were prepped at a reduced aliquot of ~0.5 g. Samples 0812177-13 and -20 were prepped using a ~0.25 g aliquot, due to high activity also. To prevent any Pu bleedthrough, 3 drops of NaNO2 were added to all samples. PEG was applied to all samples.

Spiked By: Crystal Shaeffer Date: 1/29/2009

Witnessed By: Jeffrey T. Lee Date: 1/29/2009

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	U-232	837.3610.11	20.070	DPM/ml	01/29/09	0.5	ml	AW016

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	U-234	644.3610.02	19.272	DPM/ml	01/29/09	0.5	ml	AW016
S1	U-235	644.3610.02	0.921	DPM/ml	01/29/09	0.5	ml	AW016
S1	U-238	644.3610.02	20.008	DPM/ml	01/29/09	0.5	ml	AW016

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: AS090129-1

Prep Procedure: UIISO

Prep Batch Not Validated!!!

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N Batch:

Re-Prep? Y / N Batch:

Prep QASS / NCR? Y / N

Prep SOP: PAI 778 Rev: 12

Prep Analyst: Crystal Shaeffer

Balance: 27

Prep Date: 1/29/2009

Balance:

Prep SOP: NONE

Matrix Class: solid

Prep Dept: AP

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Micro Init	Micro Date	Standards	Prep Notes
1	1	0812177-1	SMP		1	1	Dry Weight			T1	1.0289
2	1	0812177-2	SMP		1	1	Dry Weight			T1	1.0164
3	1	0812177-2	DUP		1	1	Dry Weight			T1	1.0243
4	1	0812177-3	SMP		1	1	Dry Weight			T1	1.0132
5	1	0812177-4	SMP		1	1	Dry Weight			T1	1.0102
6	1	0812177-5	SMP		1	1	Dry Weight			T1	1.0160
7	1	0812177-6	SMP		1	1	Dry Weight			T1	1.0087
8	1	0812177-7	SMP		1	1	Dry Weight			T1	1.0120
9	1	0812177-8	SMP		0.5	0.5	Dry Weight			T1	0.5071
10	1	0812177-9	SMP		1	1	Dry Weight			T1	1.0080
11	1	0812177-10	SMP		0.5	0.5	Dry Weight			T1	0.5140
12	1	0812177-11	SMP		0.5	0.5	Dry Weight			T1	0.5013
13	1	0812177-12	SMP		0.5	0.5	Dry Weight			T1	0.5077
14	1	0812177-13	SMP		0.25	0.25	Dry Weight			T1	0.2618
15	1	0812177-14	SMP		0.5	0.5	Dry Weight			T1	0.5002
16	1	0812177-15	SMP		1	1	Dry Weight			T1	1.0145
17	1	0812177-16	SMP		1	1	Dry Weight			T1	1.0031
18	1	0812177-17	SMP		1	1	Dry Weight			T1	1.0088
19	1	0812177-17	DUP		1	1	Dry Weight			T1	1.0239
20	1	0812177-18	SMP		1	1	Dry Weight			T1	1.0299
21	1	0812177-19	SMP		1	1	Dry Weight			T1	0.238-10164
22	1	0812177-20	SMP		0.25	0.25	Dry Weight			T1	1.0164
23	1	AS090129-1	MB		1	1	Dry Weight			T1	0.2518
24	1	AS090129-1	LCS		1	1	Dry Weight			S1,T1	

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: AS090129-1

Prep Procedure: UIISO

Prep Batch Not Validated!!!

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N Batch: _____

Re-Prep? Y / N Batch: _____

Prep QASS / NCR? Y / N _____

Prep SOP: PAI 778 Rev: 12

Prep SOP: NONE

Matrix Class: solid

Prep Analyst: Crystal Shaeffer

Prep Date: 1/29/2009

Prep Dept: AP

Balance: 27

Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq	Fin Alq	Prep Basis	Micro Init	Micro Date	Standards	Prep Notes
					g	g					

Comments

Spiked By: CLS Date: 1/29/09

Witnessed By: SN Date: 1/29/09

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	U-232	837.3610.11	20.070	DPM/ml	01/29/09	0.5	ml	AW016

T₁ exp: 7/30/09

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	U-234	644.3610.02	19.272	DPM/ml	01/29/09	0.5	ml	AW016
S1	U-235	644.3610.02	0.921	DPM/ml	01/29/09	0.5	ml	AW016
S1	U-238	644.3610.02	20.008	DPM/ml	01/29/09	0.5	ml	AW016

S₁ exp: 4/8/09

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: DG090105-3

Prep Procedure: Dry_Grind

Reviewed By: sdw *sdw* Review Date: 1/6/2009

Non-Routine Pre-Treatment? Y *(N)* Batch: *MT*

Prep QASS / NCR? Y *(N)* *MT*

Prep SOP: SOP336 Rev: 0

Prep Analyst: Steven D. White *sdw*

Oven Num: 18

Oven In Date: 12/19/2008 3:55:00 PM

Balance: 15

Balance:

Prep Date: 1/5/2009

Prep Dept: GP

Matrix Class: solid

Sampl Num	Prep Num	LabID	QC Type	Dish No.	Tare g	Gross g	Net g	Prep Notes
1	1	0812177-1	SMP		98.8	133.3	34.5	
2	1	0812177-2	SMP		98.8	152.1	53.3	
3	1	0812177-3	SMP		99.1	126.1	27	
4	1	0812177-4	SMP		99.1	132.7	33.6	
5	1	0812177-5	SMP		98.5	220.6	122.1	
6	1	0812177-6	SMP		99.1	220.1	121	
7	1	0812177-7	SMP		98.6	121.5	22.9	
8	1	0812177-8	SMP		98.2	154.5	56.3	
9	1	0812177-9	SMP		99.5	141.4	41.9	
10	1	0812177-10	SMP		98.8	165	66.2	
11	1	0812177-11	SMP		98.3	110.8	12.5	
12	1	0812177-12	SMP		98.7	118.8	20.1	
13	1	0812177-13	SMP		98.4	181.9	83.5	
14	1	0812177-14	SMP		99.1	111.1	12	
15	1	0812177-15	SMP		98.4	110.5	12.1	
16	1	0812177-16	SMP		98.9	115	16.1	
17	1	0812177-17	SMP		98.5	146.2	47.7	
18	1	0812177-18	SMP		98.2	147.5	49.3	
19	1	0812177-19	SMP		99.3	134.8	35.5	
20	1	0812177-20	SMP		98.3	134.2	35.9	

Comments

Spiked By: N/A Date: N/A

Witnessed By: N/A Date: N/A

SAMPLE CONDITION FORM (SOLIDS)

ANALYST: Ces

ANALYSIS DATE: 1/29/09

METHOD: Prep

WORK ORDER	SAMPLE ID	SAMPLE CONDITION		
		Dry/Wet	TEXTURE	Remarks
0812177	1	Dry	Fine	Ground
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	18			
	19			
↓	20	↓	↓	↓



Section 8

STANDARDS TRACEABILITY DOCUMENTS



Prepare a working dilution of $\sim 20.0 \frac{\text{dpm}}{\text{ml}}$ U-238 from 644.3020.53.

1) Determine Density of 1M HNO₃ lot# 073371 Bal#
 Mass of volumetric flask (100 ml) 68.2980g 12
 Mass of flask and 100 ml Acid 171.0125g 1
 Net Mass of Acid 102.7145g
 $\rho = 1.027145 \frac{\text{g}}{\text{ml}}$

2) Transfer 644.3020.53
 Mass of Empty (No lid) 1000 ml Nalgene 74.7135g 12
 Mass of Nalgene and Std. Transferred 76.1629g 1
 Net Mass of Std. Transferred 1.4494g

3) Dilute to final Vol.
 Mass of Std, Nalgene, and diluent 1155.1g 26
 Mass of Nalgene 74.7135g
 Net Mass of New Std. Dilution 1080.3865g

Final Activity Calculation

$$\frac{(242.0 \frac{\text{Bq}}{\text{g}})}{(1 \text{ Bq})} \left(\frac{60 \text{ dpm}}{1 \text{ Bq}} \right) \left(\frac{1.4494 \text{ g}}{1080.3865 \text{ g}} \right) \left(\frac{1.027145 \frac{\text{g}}{\text{ml}}}{1} \right) = 20.01 \frac{\text{dpm}}{\text{ml}}$$

Std ID: 644.3610.02

Description: U-234/238

Expiration: 4/8/2009

Activity: 20.01 dpm/mL

Density of 1.0 gram/mL assumed

2s Uncertainty: 0.12 dpm/mL

Ref. Date: 8/1/1997

Ref Time: N/A

Prep Date: 4/7/2008 Prep by: jdd

Matrix/Comp. 1 M HNO₃

Half Life (y): 4.47E+09

Reverification Log

Analysis Date	Initials	Expiration Date

Continued on Page

Read and Understood By

Signed

Date

Signed

Page 97 of 133

Direct transfer of RSO 644 to 40 mL VOA vial

Mass of VOA vial w/ lid: 20.9455 g

Mass of vial + standard: 24.6612 g

Net mass of std transferred: 3.7157 g

Bal 12



RSO 644

U-238: 242.0 Bq/g

U-235: 11.14 Bq/g

U-234: 233.1 Bq/g

A.B.
11/28/06

Continued on Page

Read and Understood By

A. Brilage
Signed11/28/06
Date
Signed7/13/08
98 of 133



National Institute of Standards & Technology

Certificate

PAT ID 0644
REC'd 10-18-02

Standard Reference Material 4321C Natural Uranium Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive natural uranium nitrate and nitric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of alpha-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains uranium-238, uranium-235, and uranium-234 with a total activity of approximately 2600 Bq. Uranium decays by alpha-particle emission. The progeny of uranium-238, uranium-235, and uranium-234 have a total activity of approximately 2600 Bq and decay by alpha- and beta-particle emission. None of the alpha or beta particles escape from the SRM ampoule. During the decay process X-rays and gamma rays with energies from 11 keV to 2.0 MeV are also emitted. Most of these photons escape from the SRM ampoule but their intensities are so small that they do not represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains nitric acid (HNO_3) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least August 2007.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899
November 1997

Thomas E. Gills, Chief
Standard Reference Materials Program

Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution contains strong acid and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle. NEVER PIPETTE BY MOUTH.
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]*.

PROPERTIES OF SRM 4321C
(Certified values are shown in bold type)

Source identification number	NIST SRM 4321C		
Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall Thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Solution density	(1.053 ± 0.001) g·mL ⁻¹ at 21.4 °C [b]*		
Solution mass	(5.258 ± 0.002) g [b]		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L ⁻¹)	Mass Fraction (g·g ⁻¹)
	H ₂ O	53	0.91
	HNO ₃	1.0	0.06
	UO ₂ (NO ₃) ₂	0.09	0.03
Radiological Properties:			
Radionuclide	Natural Uranium (Mixture of U-238, U-235, and U-234)		
Reference time	1200 EST, 1 August 1997		
Massic activity of the solution [c]	U-238: 242.0 Bq·g ⁻¹ U-235: 11.14 Bq·g ⁻¹ U-234: 233.1 Bq·g ⁻¹		
Relative expanded uncertainty (k=2)	U-238: 0.60% [d] [e] U-235: 0.62% [d] [e] U-234: 0.98% [d] [e]		
Mass fraction of uranium	(0.01960 ± 0.00010) g·g ⁻¹ [b]		
Photon-emitting impurities	None detected [f]		
Half lives used	Uranium-238: (4.468 ± 0.003) × 10 ⁹ a [g] Uranium-235: (7.038 ± 0.005) × 10 ⁸ a [g] Uranium-234: (2.455 ± 0.006) × 10 ⁵ a [g]		
Measuring instruments	Mass spectrometer, silicon surface-barrier detector, and 4π(α+β) liquid-scintillation counting systems.		

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ACTIVITY [d]*

Input Quantity x_i , the source of uncertainty (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$, the standard uncertainty of x_i (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$, (%) [h]	Relative Sensitivity Factor, $|\partial y/\partial x_i| \cdot$ (x_i/y) [i]	Relative Uncertainty Of Output Quantity, $u_i(y)/y$, (%) [j]
Isotopic uranium atom fraction in SRM 960	Standard deviation of the mean for repeated mass-spectrometric measurements (A)	U-238: 0.001 U-235: 0.07 U-234: 0.31	1.0 1.0 1.0	0.001 0.07 0.31
Half life	Standard uncertainty of the half life (A)	U-238: 0.07 U-235: 0.07 U-234: 0.25	1.0 1.0 1.0	0.07 0.07 0.25
Uranium mass fraction in SRM 960	Certificate value (B)	0.003	1.0	0.003
Quantitative dissolution	Estimated (B)	0.25	1.0	0.25
Gravimetric measurements	Estimated (B)	0.10	1.0	0.10
Photon-emitting impurities	Limit of detection (B) [k]	100.	0.001	0.10
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$, (%)		U-238: U-235: U-234:	0.30 0.31 0.49	
Coverage Factor, k				<u>x 2</u>
Relative Expanded Uncertainty of the Output Quantity, U/y , (%)		U-238: U-235: U-234:	0.60 0.62 0.98	

NOTES

- [a] The Sievert is the SI unit for dose equivalent. See reference [1]. One μSv is equal to 0.1 mrem.
 Distance from Ampoule (cm): 1 30 100
 Approximate Dose Rate ($\mu\text{Sv/h}$): <0.1 - -
- [b] The stated uncertainty is two times the standard uncertainty.
- [c] **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [d] The reported value, y , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \dots, x_n)$, where f is a mathematical function derived from the assumed model of the measurement process.

The value, x_i , used for each input quantity i has a **standard uncertainty**, $u(x_i)$, that generates a corresponding uncertainty in y , $u_i(y) \equiv |\partial y / \partial x_i| \cdot u(x_i)$, called a **component of combined standard uncertainty** of y .

The **combined standard uncertainty** of y , $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty.

The combined standard uncertainty is multiplied by a **coverage factor** of $k = 2$ to obtain U , the **expanded uncertainty** of y .

Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ with a level of confidence of approximately 95 percent.

For further information on the expression of uncertainties, see references [2] and [3].

- [e] The value of each standard uncertainty component, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic count rate is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval $U/2$ to $2U$ (i.e., within a factor of 2 of the estimated value).
- [f] Estimated limits of detection for photon-emitting impurities are:
 1.4 $\gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 8 and 59 keV,
 1.1 $\gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 67 and 88 keV,
 0.5 $\gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 102 and 197 keV,
 0.3 $\gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 205 and 762 keV,
 0.2 $\gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 770 and 996 keV, and
 0.1 $\gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 1006 and 1900 keV,
 provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of uranium-238, uranium-235, uranium-234, or their progeny.
- [g] The stated uncertainty is the standard uncertainty. See reference [5].

- [h] Relative standard uncertainty of the input quantity x_i .
- [i] The relative change in the output quantity y divided by the relative change in the input quantity x_i . If $|\partial y/\partial x_i| \cdot (x_i/y) = 1.0$, then a 1% change in x_i results in a 1% change in y . If $|\partial y/\partial x_i| \cdot (x_i/y) = 0.05$, then a 1% change in x_i results in a 0.05% change in y .
- [j] Relative component of combined standard uncertainty of output quantity y , rounded to two significant figures or less. The relative component of combined standard uncertainty of y is given by $u_i(y)/y = |\partial y/\partial x_i| \cdot u(x_i)/y = |\partial y/\partial x_i| \cdot (x_i/y) \cdot u(x_i)/x_i$. The numerical values of $u(x_i)/x_i$, $|\partial y/\partial x_i| \cdot (x_i/y)$, and $u_i(y)/y$, all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.
- [k] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e. $u(x_i)/x_i = 100\%$. $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of U-238})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of U-238})\}$. Thus $u_i(y)/y$ is the relative change in y if the impurity were present with a massic activity equal to the estimated limit of detection.

REFERENCES

- [1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900.
- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900. (Listed under ISO miscellaneous publications as "ISO Guide to the Expression 1993".)
- [3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.
- [4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.
- [5] Evaluated Nuclear Structure Data File (ENSDF), August 1997.

Standard Verification by Alpha Spectrometry

The Standard To Be Verified (A)

Analyte: U-238		
ID: 644.3610.02		
reference date = 08/01/97		
initial activity (Ai) = 20.01	dpm/mL	
Spike Volume= 2.00	mL	
half-life (T) = 4.47E+09	years	
A to B Crosstalk = 0.00	%	
Ref. QASS #: na		

The Tracer Used In The Analysis (B)

Tracer: U-232		
ID: 837.3020.90		
reference date = 03/07/07		
initial activity (Ai) = 20.00	dpm/ml	
tracer volume= 2.00	ml	
half-life (T) = 6.89E+01	years	
B to A Crosstalk = 0.00	%	
Ref. QASS #: n/a		

Analysis Data

FROM BENCHSHEET			FROM DATA OUTPUT							
Sample ID	Volume Spiked (L)	Volume Analyzed (L)	Count Date	Det. Eff.	Live Time(m)	U-238		U-232		
						Bkg.Cts.	Gross Cts.	Bkg.Cts.	Gross Cts.	
0816005-1	1.00	1.00	04/11/08	0.3028	300	2.1	2923	13.8	2773	
0816005-2	1.00	1.00	04/11/08	0.3131	300	0.6	3003	6.3	2901	
0816005-3	1.00	1.00	04/30/08	0.3134	300	0.9	2852	4.5	2923	
0816005-4B	1.00	1.00	04/11/08	0.2917	300	0.9	2851	4.2	11	

Analysis Results

Sample ID	U-232 Tracer Data			U-238 Standard Data		Result
	Expected dpm @ ct.	Observed dpm	Yield	Expected dpm @ ct.	Observed dpm	
0816005-1	39.56	30.37	0.7678	40.02	41.88	104.6% of cert. value.
0816005-2	39.56	30.82	0.7790	40.02	41.03	102.5% of cert. value.
0816005-3	39.54	31.04	0.7851	40.02	38.63	96.5% of cert. value.
0816005-4B	0.00	0.08				ACT<MDC of 0.18 dpm

Acceptance Criteria

Average % Recovery = 101.2%	PASS - within 5% of certificate value, per PA SOP.
2*Relative Std. Dev. = 6.9%	PASS - within 10% of mean value, per ICPT.
Chemical Yields= 0.77-0.79	PASS - within PA SOP yield criteria.

Data Review

Data entry by: EMB
on date: 05/01/08

Benchsheet reviewed: YES / NO
Data entry checked: YES / NO
Spectral quality, yields: YES / NO
Blank activity checked: YES / NO
Blank meets default MDCs: YES / NO 0.2 pCi/L

Reviewed by: GB MC
on date: 5/1/08 7/13/08

CROSSTALK NOTE: Due to the possibility of tailing from one ROI into another, a known "crosstalk factor" may be applied to the raw count data. In these cases, the estimated number of counts that spill over into the adjacent ROI are arithmetically returned to the ROI of origin. In these cases the crosstalk factor and related information are documented on a QASS, which is referenced on this sheet, if applicable.

Prepare a Working Dilution of 837.3020.72 U-232 at
~ 20 dpm/mL

1) Density calculation of 1M HNO₃ lot # 076081 bal #
 Mass of 100 mL Vol. flask 66.4339g 12
 Mass of Flask and 100 mL Acid 169.1236g 1
 Net Mass of 100 mL Acid 102.6897g
 $\rho = 1.026897 \text{ g/mL}$

2) Mass of Std. Transferred (solid)
 Mass of empty 1000 mL Nalgene 74.7411g 12
 Mass of Nalgene and Std. Transf. 78.0230g 1
 Net Mass of Std. Transferred 3.2819g

3) Dilute to Final Volume
 Mass of Std. bottle diluent 1185.9g 26
 Mass of empty Nalgene 74.7411g 12
 Net Mass of New Dilution 1111.1589g

Activity Calculation

$$\left(6745.123 \frac{\text{dpm}}{\text{g}}\right) \left(3.2819 \text{ g}\right) \left(1.026897 \frac{\text{g}}{\text{mL}}\right) \left(\frac{1}{1111.1589 \text{ g}}\right) = 20.46 \frac{\text{dpm}}{\text{mL}}$$

Std ID: 837.3610.11

RG 9/10/08

Description: U-232

Expiration: 7/30/2009

Activity: 20.46 dpm/mL

2s Uncertainty: 5.00 dpm/mL

Ref. Date: 3/7/2007

Ref Time: N/A

Prep Date: 7/30/2008 Prep by: JD

Matrix/Comp. 1M HNO₃

Half Life (y): 4.38E+03

U²³³ impurity present; ck stds trace pkg

Reverification Log


Analysis Date	Initials	Expiration Date

RG 9/10/08

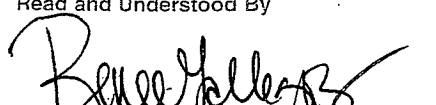
RG 9/10/08

Continued on Page

Read and Understood By


Signed

7/28/08
Date


Signed

9/10/08
Date

Prepare a primary dilution of U-232, ISO #837, by diluting contents (#74682-307) to a final volume of approx 40 ml.

1) Prepare a 1.0 M HNO_3 solution by diluting 63 ml conc HNO_3 , Fischer lot # 065460, in 1 L DI water.

2) Determine density of $\frac{1.0 \text{ M}}{1.0 \text{ M}} \text{HNO}_3$ lot # 065460 (Bal 12)

Mass of 100 ml volumetric flask: 62.4704g

Mass of flask + acid: 165.3413g

Net mass of acid: 102.8709g

$\therefore 100 \text{ ml} = \text{density of } 1.0 \text{ M } \text{HNO}_3 : 1.029 \text{ g/ml}$

3) Transfer contents of vial to a 40 ml VOA vial (Bal 12)

Mass of VOA vial (w/ lid): 24.7623g

Mass of VOA vial + std: 29.9487g

Net mass of std transferred: 5.1864g

4) Dilute with 1.0 M HNO_3 (Bal 12)

Mass of vial + std + acid: 63.2324g

Mass of vial from above: 24.7623g

Net mass of primary std: 38.4701g

5) Final Activity Calculation:

$$\frac{4375 \text{ cps (60 s/min)} (5.1864 \text{ g})}{(5.2465 \text{ g}) (38.4701 \text{ g})} = 6745.123 \text{ dpm/g}$$

Continued on Page

Read and Understood By

Kruptal Brown
Signed

3/28/07
Date

Renee Kallejo
Signed

4/11/07
107 of 133
Date



Eckert & Ziegler

Analytics

RSO # 837
Rec'd 3/14/07 MMD

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404.352.8677
Fax 404.352.2837
www.analytiscinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

74682-307

U-232 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by the Department Des Applications Et De La Metrologie Des Rayonnements Ionisants (DAMRI), Paris, France, as Number 23236.

Radionuclide purity and calibration were checked with a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	U-232
ACTIVITY (Bq):	4.375 E3
HALF-LIFE:	68.9 years
CALIBRATION DATE:	March 7, 2007 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	5.0%

Impurities: γ -impurities <0.1%
U-233 <0.3%
Am-241 <0.15%

5.24665 grams 1M HNO₃ solution.

PO NUMBER 72905, Item 1

SOURCE PREPARED BY:

M. D. Dimitrova
M. D. Dimitrova, Radiochemist

Q A APPROVED:

M. M. J. 3-8-07



Section 9

ADDITIONAL SUPPORTING DOCUMENTATION



Alpha Spectroscopy

Quality Control Data

Weekly Background, Energy, and Efficiency Calibrations

Calibration Data Summary

Laboratory Name: ALS Environmental -- FC
PAI Work Order: 0812177

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Wednesday, February 11, 2009
9:41:24 AM

Lab Sample ID Spectrum Analysis Date	QC Type	Batch ID Analysis Run	Test Name	Detector Id	Eff Spectrum Bkg Spectrum Egy Spectrum	Eff Date Bkg Date Egy Date	RESULTS %Efficiency Bkg CPM Energy keV	FLAGS Efficiency Background Energy	LCL %Efficiency Bkg CPM Energy keV	LWL %Efficiency Bkg CPM Energy keV	UWL %Efficiency Bkg CPM Energy keV	UCL %Efficiency Bkg CPM Energy keV
0812177-1 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	9	C09020309 B09020309 C09020309	2/3/2009 2/3/2009 2/3/2009	31.07 0.1630 5534.1	Pass Pass Pass	29.48 0.0000 5496.0	30.00 0.0498 5506.0	32.06 0.4980 5586.0	32.58 0.7500 5596.0
0812177-2 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	10a	C09020310 B09020310 C09020310	2/3/2009 2/3/2009 2/3/2009	31.67 0.0940 5545.9	Pass Pass Pass	29.79 0.0000 5486.2	30.31 0.0498 5496.2	32.41 0.4980 5576.2	32.93 0.7500 5586.2
0812177-2 Spectrum #1 2/4/2009	DUP	AS090129-1 AS090129-1A	UI50	11	C09020311 B09020311 C09020311	2/3/2009 2/3/2009 2/3/2009	31.58 0.0820 5561.5	Pass Pass Pass	29.69 0.0000 5497.0	30.21 0.0498 5507.0	32.29 0.4980 5587.0	32.81 0.7500 5597.0
0812177-3 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	12	C09020312 B09020312 C09020312	2/3/2009 2/3/2009 2/3/2009	30.45 0.0840 5546.0	Pass Pass Pass	29.29 0.0000 5507.7	29.80 0.0498 5517.7	31.86 0.4980 5597.7	32.37 0.7500 5607.7
0812177-4 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	13	C09020313 B09020313 C09020313	2/3/2009 2/3/2009 2/3/2009	32.25 0.1270 5536.2	Pass Pass Pass	30.25 0.0000 5486.2	30.78 0.0498 5496.2	32.90 0.4980 5576.2	33.43 0.7500 5586.2
0812177-5 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	14	C09020314 B09020314 C09020314	2/3/2009 2/3/2009 2/3/2009	31.00 0.0890 5547.9	Pass Pass Pass	29.51 0.0000 5486.5	30.02 0.0498 5496.5	32.10 0.4980 5576.5	32.61 0.7500 5586.5
0812177-6 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	16	C09020316 B09020316 C09020316	2/3/2009 2/3/2009 2/3/2009	30.77 0.1080 5555.8	Pass Pass Pass	29.39 0.0000 5484.4	29.91 0.0498 5504.4	31.97 0.4980 5584.4	32.49 0.7500 5594.4
0812177-7 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	17	C09020317 B09020317 C09020317	2/3/2009 2/3/2009 2/3/2009	30.93 0.3440 5532.6	Pass Pass Pass	28.99 0.0000 5486.5	29.50 0.0498 5496.5	31.54 0.4980 5576.5	32.05 0.7500 5586.5
0812177-8 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	18	C09020318 B09020318 C09020318	2/3/2009 2/3/2009 2/3/2009	30.42 0.3170 5534.4	Pass Pass Pass	28.65 0.0000 5496.0	29.15 0.0498 5506.0	31.17 0.4980 5586.0	31.67 0.7500 5596.0

Data Package ID: UR0812177-1

Abbreviations:	Eff - Efficiency	Bkg - Background	LCL - Lower Control Limit	UWL - Upper Warning Limit
111	Egy - Energy	CPM - Counts per Minute	LWL - Lower Warning Limit	UCL - Upper Control Limit
133				CI - The Analysis Date exceeds the Calibration Date by more than 7 days.

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

Calibration Data Summary

Laboratory Name: ALS Environmental -- FC
PAI Work Order: 0812177

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Wednesday, February 11, 2009
9:41:24 AM

Lab Sample ID Spectrum Analysis Date	QC Type	Batch ID Analysis Run	Test Name	Detector Id	Eff Spectrum Bkg Spectrum Egy Spectrum	Eff Date Bkg Date Egy Date	RESULTS %Efficiency Bkg CPM Energy keV	FLAGS Efficiency Background Energy	LCL %Efficiency Bkg CPM Energy keV	LWL %Efficiency Bkg CPM Energy keV	UWL %Efficiency Bkg CPM Energy keV	UCL %Efficiency Bkg CPM Energy keV
0812177-9 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	19	C09020319 B09020319 C09020319	2/3/2009 2/3/2009 2/3/2009	29.06 0.2790 5536.2	Pass Pass Pass	27.99 0.0000 5496.0	28.48 0.0498 5506.0	30.44 0.4980 5586.0	30.93 0.7500 5596.0
0812177-10 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	21	C09020321 B09020321 C09020321	2/3/2009 2/3/2009 2/3/2009	29.15 0.2420 5544.2	Pass Pass Pass	27.48 0.0000 5496.0	27.97 0.0498 5506.0	29.89 0.4980 5586.0	30.38 0.7500 5596.0
0812177-11 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	22	C09020322 B09020322 C09020322	2/3/2009 2/3/2009 2/3/2009	28.13 0.2140 5543.9	Pass Pass Pass	26.66 0.0000 5494.2	27.12 0.0498 5504.2	29.00 0.4980 5584.2	29.46 0.7500 5594.2
0812177-12 Spectrum #1 2/4/2009	SMP	AS090129-1 AS090129-1A	UI50	23	C09020323 B09020323 C09020323	2/3/2009 2/3/2009 2/3/2009	29.14 0.2480 5543.9	Pass Pass Pass	27.37 0.0000 5503.7	27.85 0.0498 5513.7	29.77 0.4980 5593.7	30.25 0.7500 5603.7
0812177-13 Spectrum #1 2/10/2009	SMP	AS090129-1 AS090129-1A	UI50	25	C09020425 B09020425 C09020425	2/4/2009 2/4/2009 2/4/2009	29.10 0.2790 5546.0	Pass Pass Pass	26.95 0.0000 5496.0	27.42 0.0500 5506.0	29.32 0.5000 5586.0	29.79 0.7500 5596.0
0812177-14 Spectrum #1 2/9/2009	SMP	AS090129-1 AS090129-1A	UI50	11	C09020311 B09020311 C09020311	2/3/2009 2/3/2009 2/3/2009	31.58 0.0820 5561.5	Pass Pass Pass	29.69 0.0000 5497.0	30.21 0.0498 5507.0	32.29 0.4980 5587.0	32.81 0.7500 5597.0
0812177-15 Spectrum #1 2/6/2009	SMP	AS090129-1 AS090129-1A	UI50	11	C09020311 B09020311 C09020311	2/3/2009 2/3/2009 2/3/2009	31.58 0.0820 5561.5	Pass Pass Pass	29.69 0.0000 5497.0	30.21 0.0498 5507.0	32.29 0.4980 5587.0	32.81 0.7500 5597.0
0812177-16 Spectrum #1 2/6/2009	SMP	AS090129-1 AS090129-1A	UI50	13	C09020313 B09020313 C09020313	2/3/2009 2/3/2009 2/3/2009	32.25 0.1270 5536.2	Pass Pass Pass	30.25 0.0000 5486.2	30.78 0.0498 5496.2	32.90 0.4980 5576.2	33.43 0.7500 5586.2
0812177-17 Spectrum #1 2/6/2009	SMP	AS090129-1 AS090129-1A	UI50	14	C09020314 B09020314 C09020314	2/3/2009 2/3/2009 2/3/2009	31.00 0.0890 5547.9	Pass Pass Pass	29.51 0.0000 5486.5	30.02 0.0498 5496.5	32.10 0.4980 5576.5	32.61 0.7500 5586.5

Data Package ID: UR0812177-1

Abbreviations:	Eff - Efficiency	Bkg - Background	LCL - Lower Control Limit	UWL - Upper Warning Limit
	Egy - Energy	CPM - Counts per Minute	LWL - Lower Warning Limit	UCL - Upper Control Limit
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Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Calibration Data Summary

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 778

Reported on: Wednesday, February 11, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 714

9:41:24 AM

Lab Sample ID Spectrum Analysis Date	QC Type	Batch ID Analysis Run	Test Name	Detector Id	Eff Spectrum Bkg Spectrum Egy Spectrum	Eff Date Bkg Date Egy Date	RESULTS %Efficiency Bkg CPM Energy keV	FLAGS Efficiency Background Energy	LCL %Efficiency Bkg CPM Energy keV	LWL %Efficiency Bkg CPM Energy keV	UWL %Efficiency Bkg CPM Energy keV	UCL %Efficiency Bkg CPM Energy keV
0812177-17 Spectrum #1 2/6/2009	DUP	AS090129-1 AS090129-1A	UI50	16	C09020316 B09020316 C09020316	2/3/2009 2/3/2009 2/3/2009	30.77 0.1080 5555.8	Pass Pass Pass	29.39 0.0000 5494.4	29.91 0.0498 5504.4	31.97 0.4980 5584.4	32.49 0.7500 5594.4
0812177-18 Spectrum #1 2/6/2009	SMP	AS090129-1 AS090129-1A	UI50	17	C09020317 B09020317 C09020317	2/3/2009 2/3/2009 2/3/2009	30.93 0.3440 5532.6	Pass Pass Pass	28.99 0.0000 5486.5	29.50 0.0498 5496.5	31.54 0.4980 5576.5	32.05 0.7500 5586.5
0812177-19 Spectrum #1 2/6/2009	SMP	AS090129-1 AS090129-1A	UI50	18	C09020318 B09020318 C09020318	2/3/2009 2/3/2009 2/3/2009	30.42 0.3170 5534.4	Pass Pass Pass	28.65 0.0000 5496.0	29.15 0.0498 5506.0	31.17 0.4980 5586.0	31.67 0.7500 5596.0
0812177-20 Spectrum #1 2/10/2009	SMP	AS090129-1 AS090129-1A	UI50	26	C09020426 B09020426 C09020426	2/4/2009 2/4/2009 2/4/2009	30.59 0.3170 5543.9	Pass Pass Pass	29.40 0.0000 5496.0	29.92 0.0498 5506.0	31.98 0.4998 5586.0	32.50 0.7500 5596.0
AS090129-1 Spectrum #1 2/10/2009	MB	AS090129-1 AS090129-1A	UI50	27	C09020427 B09020427 C09020427	2/4/2009 2/4/2009 2/4/2009	29.78 0.2620 5544.2	Pass Pass Pass	28.26 0.0000 5494.2	28.76 0.0500 5504.2	30.74 0.5000 5584.2	31.24 0.7500 5594.2
AS090129-1 Spectrum #1 2/6/2009	LCS	AS090129-1 AS090129-1A	UI50	23	C09020323 B09020323 C09020323	2/3/2009 2/3/2009 2/3/2009	29.14 0.2480 5543.9	Pass Pass Pass	27.37 0.0000 5503.7	27.85 0.0498 5513.7	29.77 0.4980 5593.7	30.25 0.7500 5603.7

Data Package ID: UR0812177-1

Abbreviations:	Eff - Efficiency	Bkg - Background	LCL - Lower Control Limit	UWL - Upper Warning Limit
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ALS Environmental -- FC

LIMS Version: 6.622

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Alpha Spec Calibration Source Re-Certification

Recalibration performed by Isotope Products Laboratories

Primary Certified Source

Source PA ID: 190

Planchet Label: 9

Recalibrated on: 6/1/2007

Received by PA on: 6/6/2007

Values from certificate

Source ID: 92MIX223027

Total Activity: 3780.5962 dpm

Ref. Date: 6/1/07

Nuclide	Act (Bq)	Act (dpm)	Half-Life (yrs)	Decay Corrected
U-234:	49.81	2894.6	2.48E+05	2894.59 dpm
U-235:	1.10	65.94	7.04E+08	65.94 dpm
Am-241:	12.00	720	432.17	718.88 dpm
		TOTAL		3779.41 dpm

Efficiency Determination for Detector: 25

Source Serial#	PA ID	Sequential #	Count Date	Am-241 net cts	U-234 net cts	U-235 net cts	count dur (s)	Total cpm	Known dpm	Detector efficiency
92MIX223027	190	97-19-103-09	5/20/08	7113	29841	789	2100	1078.37	3779.41	28.53%

Sources 1 through 8 activity determination

Source Serial#	PA ID	Sequential #	Count Date	Am-241 net cts	U-234 net cts	U-235 net cts	count dur (s)	Detector Efficiency	Am-241 dpm	U-234 dpm	U-235 dpm	Combined dpm
92MIX223028	182	97-19-103-01	5/20/08	12417	73969	1678	2100	28.53%	1243.38	7408.92	168.03	8818.33
92MIX223028	183	97-19-103-02	5/20/08	14459	141741	3156	2100	28.53%	1447.86	14193.30	316.03	15957.19
92MIX223028	184	97-19-103-03	5/20/08	60052	68294	1480	2100	28.53%	6838.65	6814.16	148.20	13801.00
92MIX223021	185	97-19-103-04	5/20/08	20822	58470	1507	2100	28.53%	2086.02	5854.92	160.90	8090.85
92MIX223025	186	97-19-103-05	5/20/08	94084	114792	2491	2100	28.53%	9421.15	11494.75	249.44	21165.34
92MIX223022	187	97-19-103-06	5/20/08	71430	75977	1693	2100	28.53%	7162.68	7597.98	166.53	14917.18
92MIX223023	188	97-19-103-07	5/20/08	41741	65445	1420	2100	28.53%	4178.76	6553.37	142.19	10875.31
92MIX223029	189	97-19-103-08	5/20/08	31922	200052	4643	2100	28.53%	3186.62	20032.30	464.93	23693.76

Efficiency Verification

Source Serial#	PA ID	Sequential #	Count Date	Am-241 net cts	U-234 net cts	U-235 net cts	Count dur (s)	Total cpm	Known dpm	Detector efficiency	RPD	FLAG
92MIX223027	190	97-19-103-09	5/2/08	6867	28575	781	2100	1068.37	3779.41	28.22%	1.12%	PASS

Sources 1 through 8 activity re-verification

Source Serial#	PA ID	Sequential #	Combined Observed dpm	Combined Certified dpm*	Percent Difference %	Within 5% of Certified value?
92MIX223028	182	97-19-103-01	8816.33	8867.05	-0.55%	Yes
92MIX223028	183	97-19-103-02	15957.19	16011.39	-0.34%	Yes
92MIX223028	184	97-19-103-03	13601.00	13588.11	0.09%	Yes
92MIX223021	185	97-19-103-04	8090.85	8188.77	-1.20%	Yes
92MIX223025	186	97-19-103-05	21165.34	21096.48	0.33%	Yes
92MIX223022	187	97-19-103-06	14917.18	15382.14	-3.02%	Yes
92MIX223023	188	97-19-103-07	10875.31	10781.48	0.87%	Yes
92MIX223029	189	97-19-103-08	23693.76	24636.41	-0.24%	Yes

* Certificate values decay corrected to the count date

Data from certificates

Reference Date	U-234 (Bq)	U-234 (dpm)	U-235 (Bq)	U-235 (dpm)	Am-241 (Bq)	Am-241 (dpm)
5/1/2003	124.10	7446.00	2.43	145.74	21.43	1285.80
5/1/2003	238.30	14358.00	4.20	252.00	23.55	1413.00
5/1/2003	119.40	7164.00	1.93	115.56	106.00	6360.00
4/1/2003	101.00	6060.00	1.26	75.84	34.50	2070.00
4/1/2003	203.00	12180.00	3.41	204.72	146.40	8784.00
4/1/2003	132.90	7974.00	3.17	189.96	121.30	7278.00
4/1/2003	107.10	6426.00	0.93	55.94	72.26	4335.60
5/1/2003	334.80	20088.00	6.55	393.18	53.02	3181.20

OK
MC
6/5/08

Analyst: ORTEC

Detector: 25 190 98 5/21/08

Energy Calibration: RSO (Source 9)

Description:

Calibration

Analysis Date: 5/20/2008 11:57:30AM

Calibration Type: Energy And Efficiency

Certificate ID: A9 RSO#190

Prepared by: IPL

Description:

Source Info

Certification Date: 6/1/2007 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 10:43:22AM

Live Time: 35.00 min.

Real Time: 35.01 min.

Efficiency Calibration Name: RSO (Source 9)

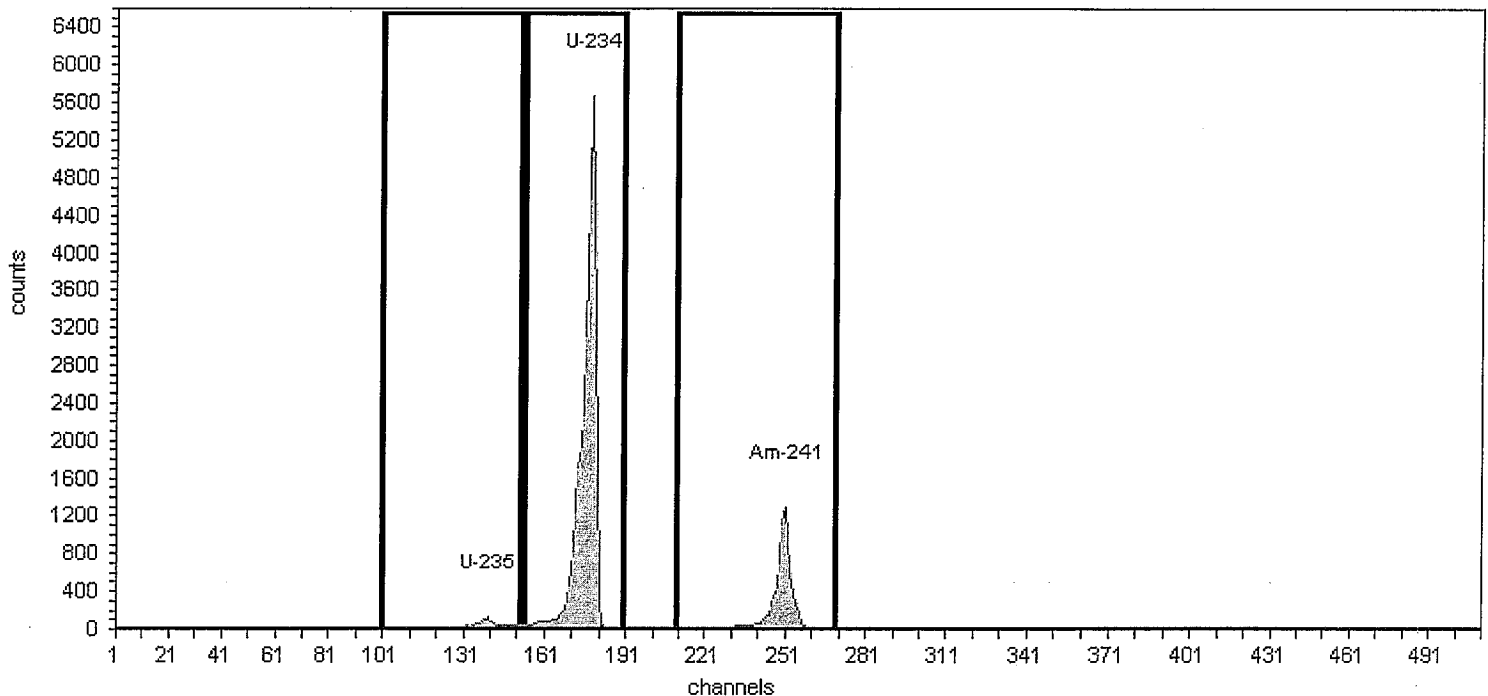
Energy Calibration Equation:

Gain = 9.8047 keV / Ch

Offset = 3,026.20 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 28.47% +/- 0.30% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	140	4.40	100	152	789.00	22.54
U-234	178	4.78	153	190	29,841.00	852.60
Am-241	251	5.49	210	270	7,113.00	203.23

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 182 (Source 1)

Description:

Certificate ID: A1 RSO#182

Prepared by: IPL

Description:

Calibration

Analysis Date: 5/20/2008 12:25:48PM
Calibration Type: Energy And Efficiency

Source Info

Certification Date: 5/1/2003 12:00:45PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 11:35:12AM

Live Time: 35.00 min.

Real Time: 35.03 min.

Efficiency Calibration Name: RSO 182 (Source 1)

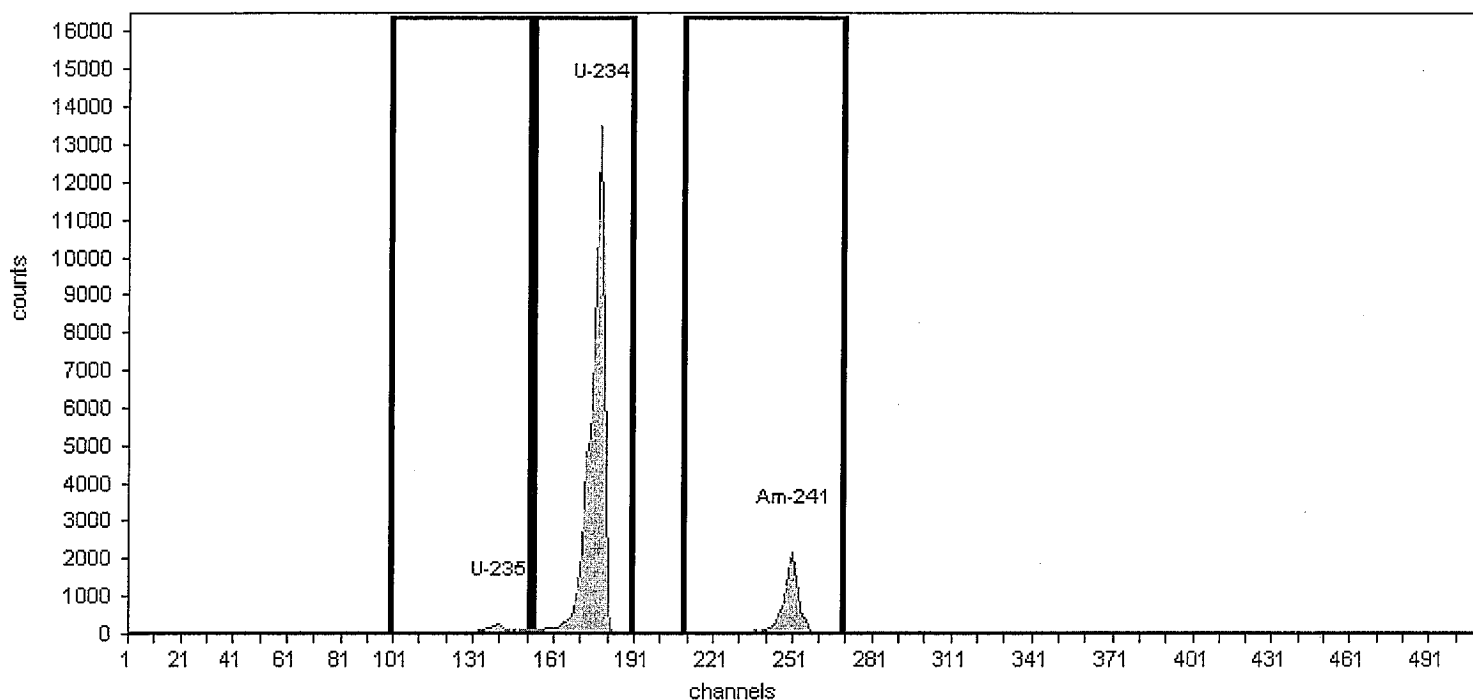
Energy Calibration Equation:

Gain = 9.8047 keV / Ch

Offset = 3,026.20 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 28.35% +/- 0.19% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	140	4.40	100	152	1,678.00	47.94
U-234	178	4.78	153	190	73,969.00	2,113.40
Am-241	251	5.49	210	270	12,417.00	354.77

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 183 (Source 2)

Description:

Certificate ID: A2 RSO#183

Prepared by: IPL

Description:

CalibrationAnalysis Date: 5/20/2008 1:05:28PM
Calibration Type: Energy And Efficiency**Source Info**

Certification Date: 5/1/2003 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 12:26:40PM

Live Time: 35.00 min.

Real Time: 35.05 min.

Efficiency Calibration Name: RSO 183 (Source 2)

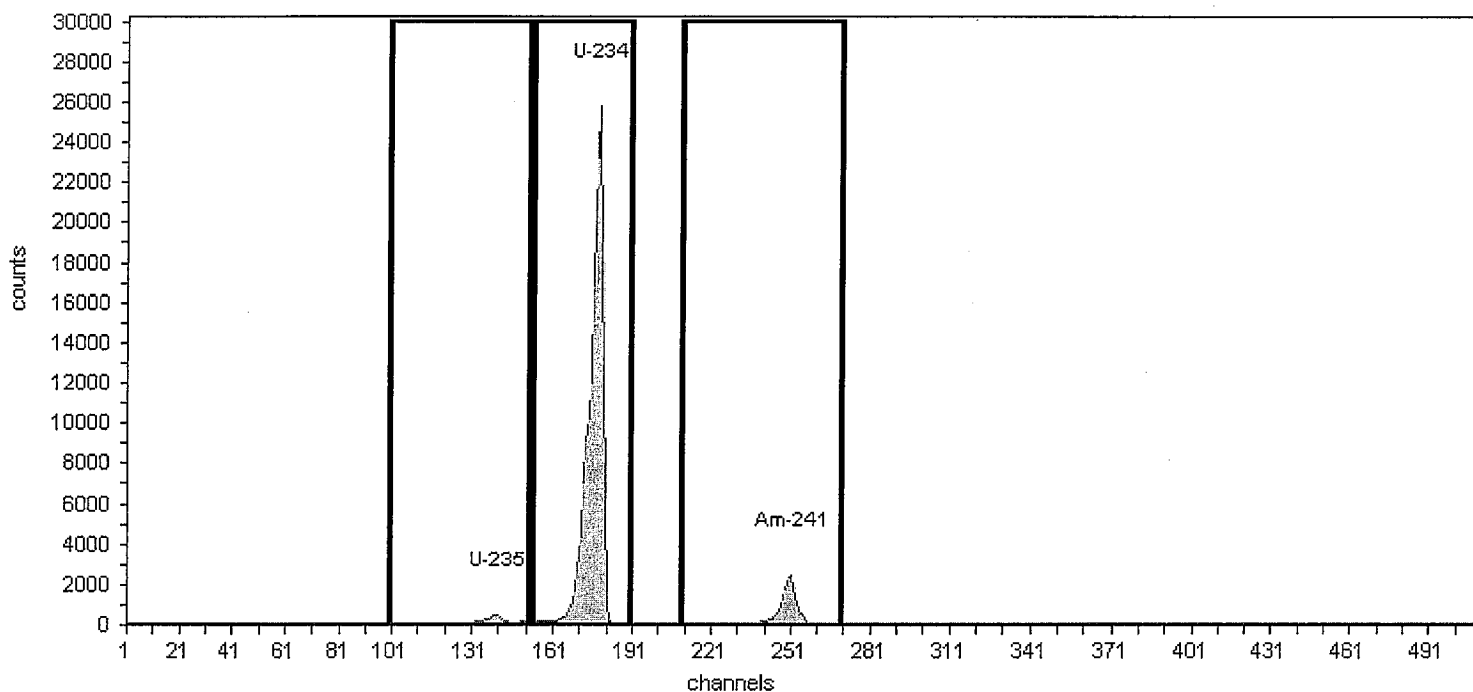
Energy Calibration Equation:

Gain = 9.8047 keV / Ch

Offset = 3,026.20 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 28.38% +/- 0.14% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	140	4.40	100	152	3,156.00	90.17
U-234	178	4.78	153	190	141,741.00	4,049.74
Am-241	251	5.49	210	270	14,459.00	413.11

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 184 (Source 3)

Description:

Calibration

Analysis Date: 5/20/2008 1:45:22PM

Calibration Type: Energy And Efficiency

Certificate ID: A3 RSO#184

Prepared by: IPL

Description:

Source Info

Certification Date: 5/1/2003 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 1:06:02PM

Live Time: 35.00 min.

Real Time: 35.04 min.

Efficiency Calibration Name: RSO 184 (Source 3)

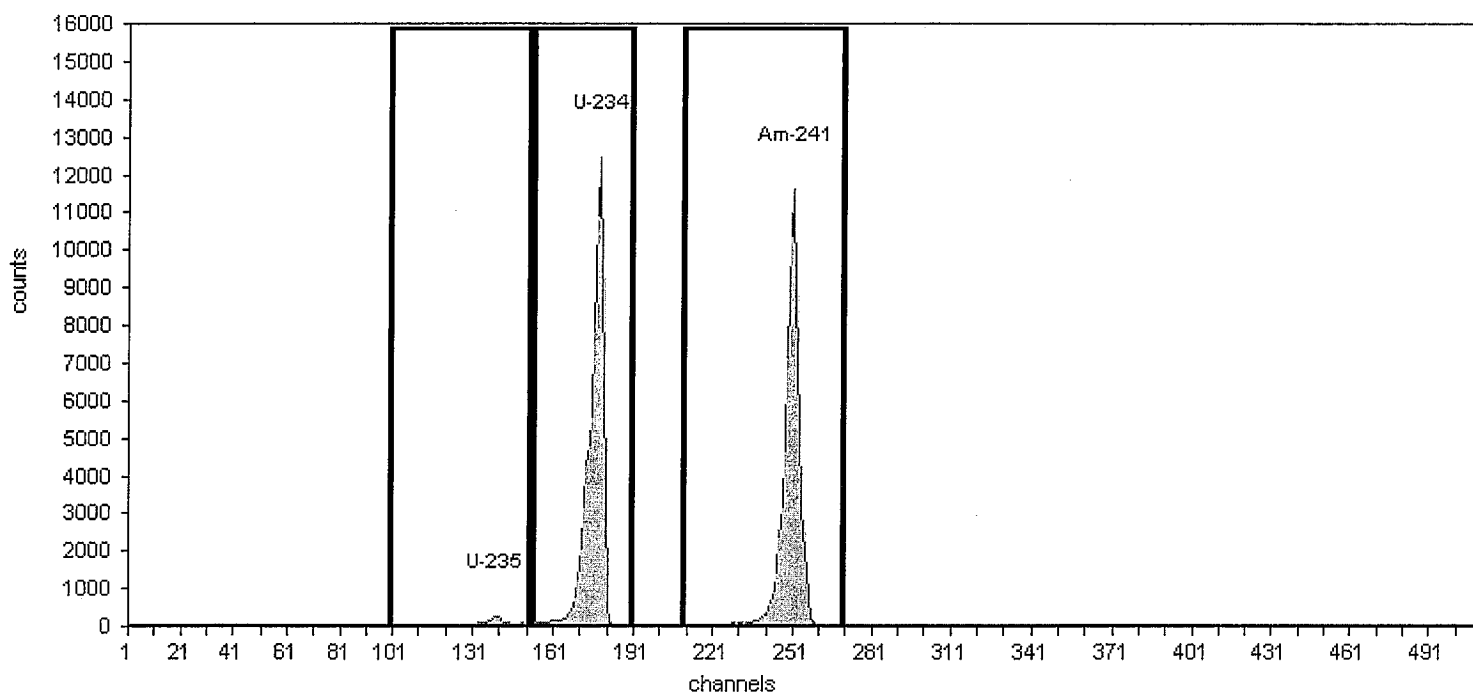
Energy Calibration Equation:

Gain = 9.7289 keV / Ch

Offset = 3,043.84 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 28.45% +/- 0.16% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	1,480.00	42.29
U-234	178	4.78	153	190	68,294.00	1,951.26
Am-241	251	5.49	210	270	66,052.00	1,887.20

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 185 (Source 4)

Description:

Certificate ID: A4 RSO#185

Prepared by: IPL

Description:

Calibration

Analysis Date: 5/20/2008 2:41:04PM

Calibration Type: Energy And Efficiency

Source Info

Certification Date: 4/1/2003 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 1:45:05PM

Live Time: 35.00 min.

Real Time: 35.02 min.

Efficiency Calibration Name: RSO 185 (Source 4)

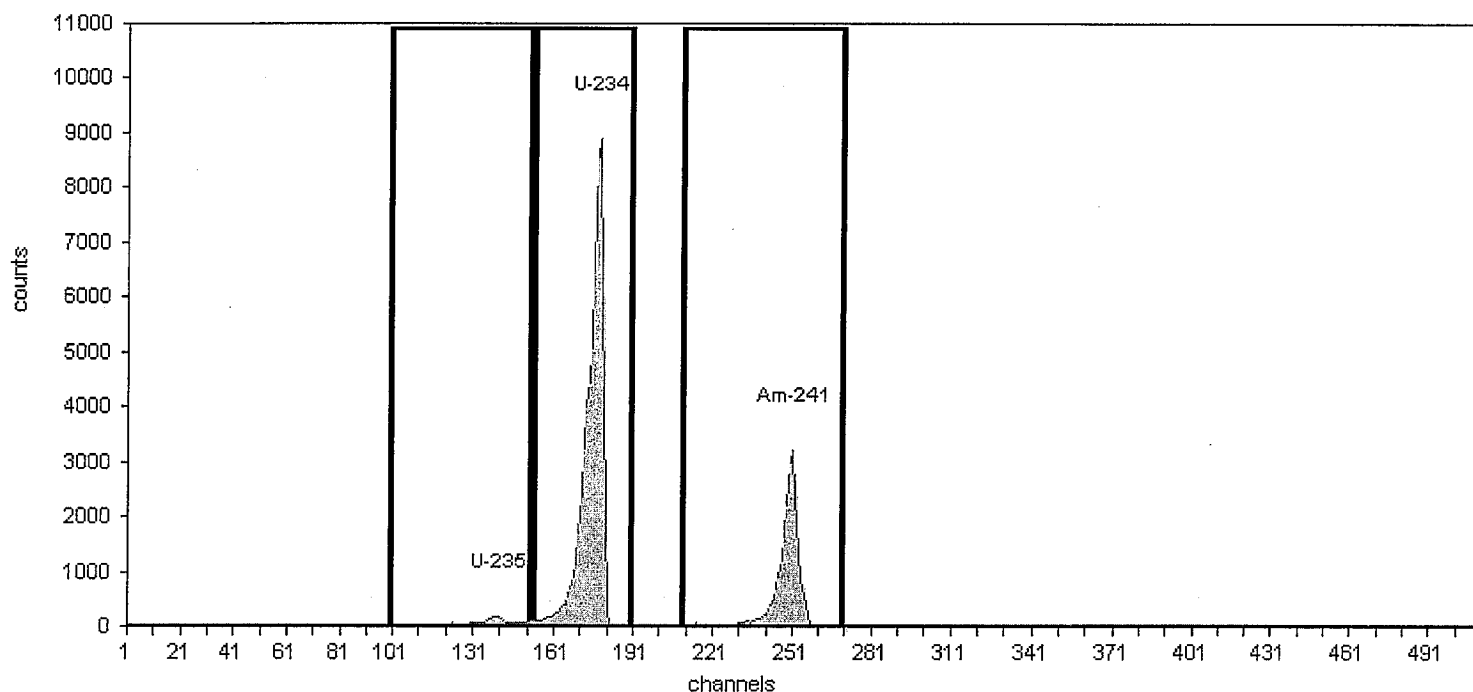
Energy Calibration Equation:

Gain = 9.8047 keV / Ch

Offset = 3,026.20 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 27.92% +/- 0.20% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	140	4.40	100	152	1,507.00	43.06
U-234	178	4.78	153	190	58,470.00	1,670.57
Am-241	251	5.49	210	270	20,822.00	594.91

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 186 (Source 5)

Description:

Certificate ID: A5 RSO#186

Prepared by: IPL

Description:

Calibration

Analysis Date: 5/20/2008 3:26:01PM
Calibration Type: Energy And Efficiency

Source Info

Certification Date: 4/1/2003 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 2:41:31PM

Live Time: 35.00 min.

Real Time: 35.06 min.

Efficiency Calibration Name: RSO 186 (Source 5)

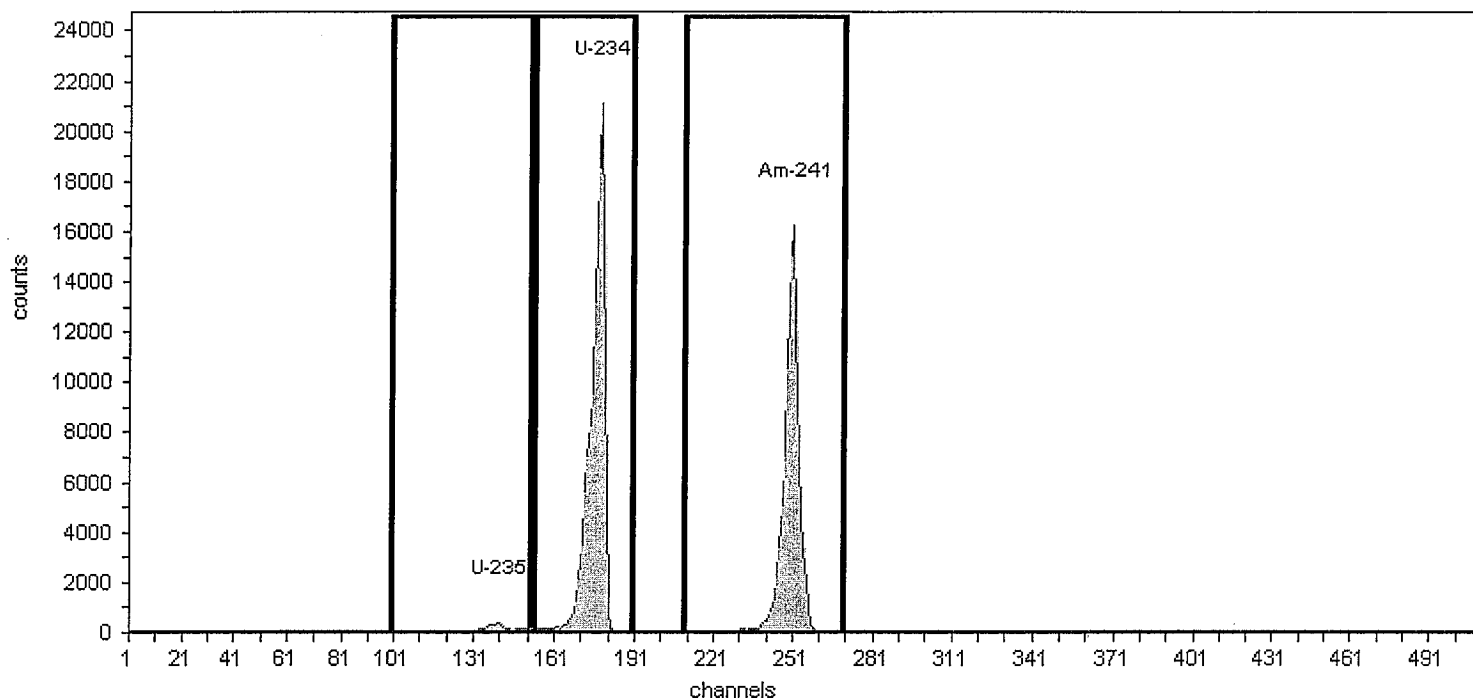
Energy Calibration Equation:

Gain = 9.8047 keV / Ch

Offset = 3,026.20 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 28.47% +/- 0.13% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	140	4.40	100	152	2,491.00	71.17
U-234	178	4.78	153	190	114,792.00	3,279.77
Am-241	251	5.49	210	270	94,084.00	2,688.11

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 187 (Source 6)

Description:

Certificate ID: A6 RSO#187

Prepared by: IPL

Description:

Calibration

Analysis Date: 5/20/2008 4:02:57PM
Calibration Type: Energy And Efficiency

Source Info

Certification Date: 4/1/2003 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 3:26:48PM

Live Time: 35.00 min.

Real Time: 35.05 min.

Efficiency Calibration Name: RSO 187 (Source 6)

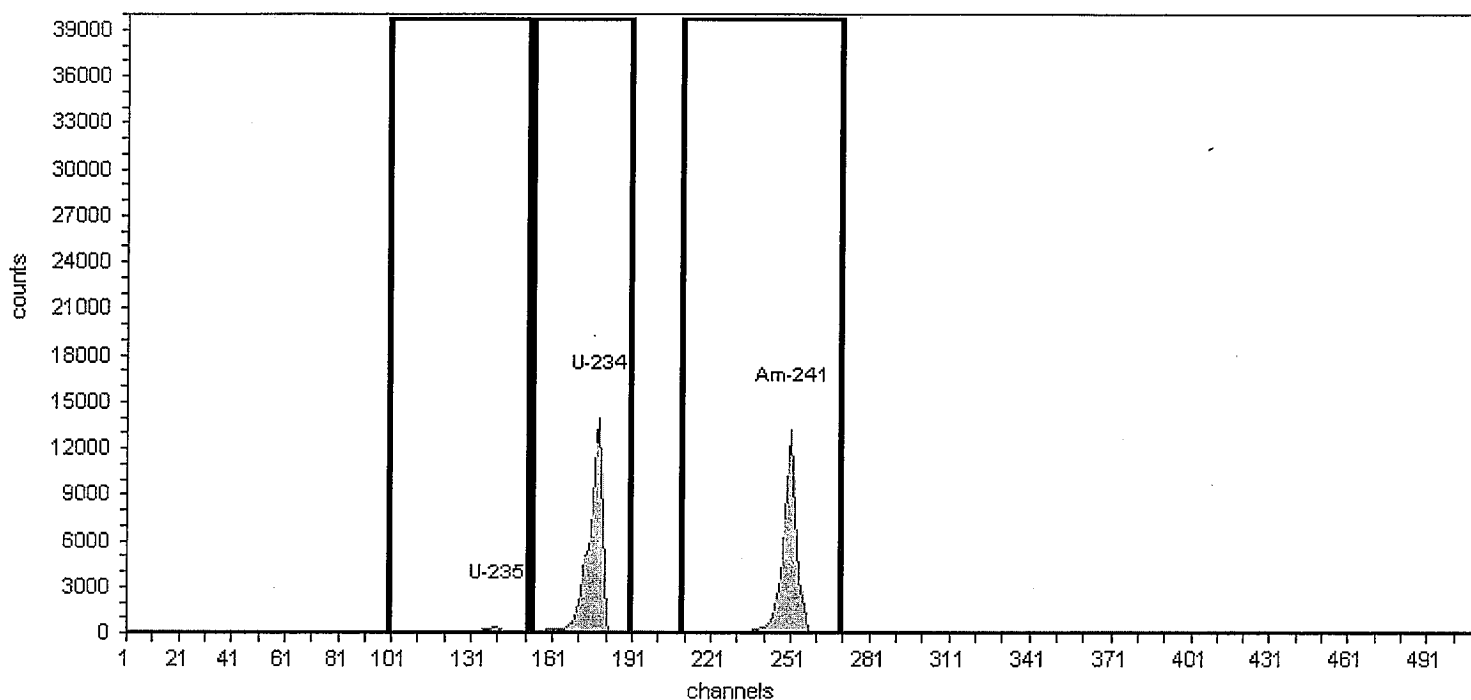
Energy Calibration Equation:

Gain = 9.8047 keV / Ch

Offset = 3,026.20 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 27.69% +/- 0.14% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	140	4.40	100	152	1,663.00	47.51
U-234	178	4.78	153	190	75,877.00	2,167.91
Am-241	251	5.49	210	270	71,430.00	2,040.86

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 188 (Source 7)

Description:

Certificate ID: A7 RSO#188

Prepared by: IPL

Description:

Calibration

Analysis Date: 5/20/2008 4:41:56PM

Calibration Type: Energy And Efficiency

Source Info

Certification Date: 4/1/2003 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 4:03:54PM

Live Time: 35.00 min.

Real Time: 35.03 min.

Efficiency Calibration Name: RSO 188 (Source 7)

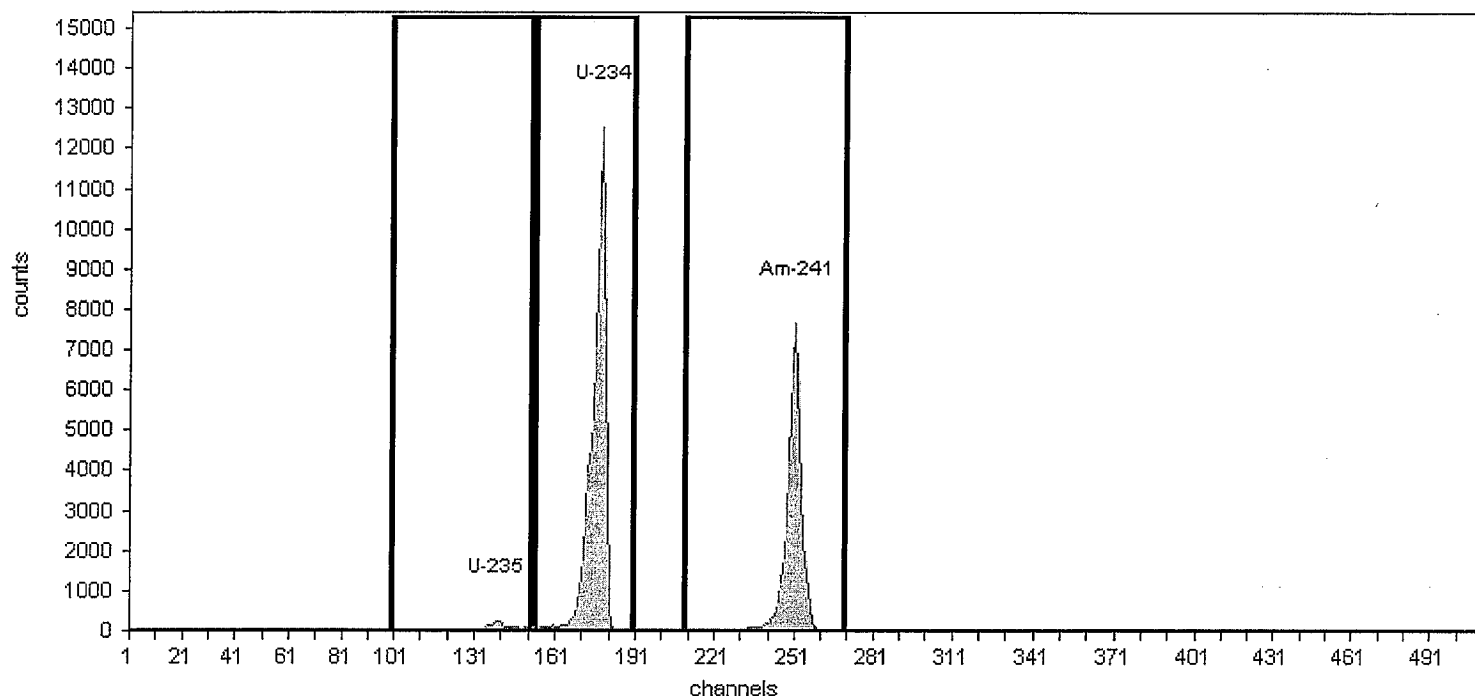
Energy Calibration Equation:

Gain = 9.7289 keV / Ch

Offset = 3,043.84 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 28.55% +/- 0.18% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	1,420.00	40.57
U-234	178	4.78	153	190	65,445.00	1,869.86
Am-241	251	5.49	210	270	41,741.00	1,192.60

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 189 (Source 8)

Description:

Certificate ID: A8 RSO#189

Prepared by: IPL

Description:

Calibration

Analysis Date: 5/21/2008 8:30:29AM

Calibration Type: Energy And Efficiency

Source Info

Certification Date: 4/1/2003 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/20/2008 4:42:28PM

Live Time: 35.00 min.

Real Time: 35.07 min.

Efficiency Calibration Name: RSO 189 (Source 8)

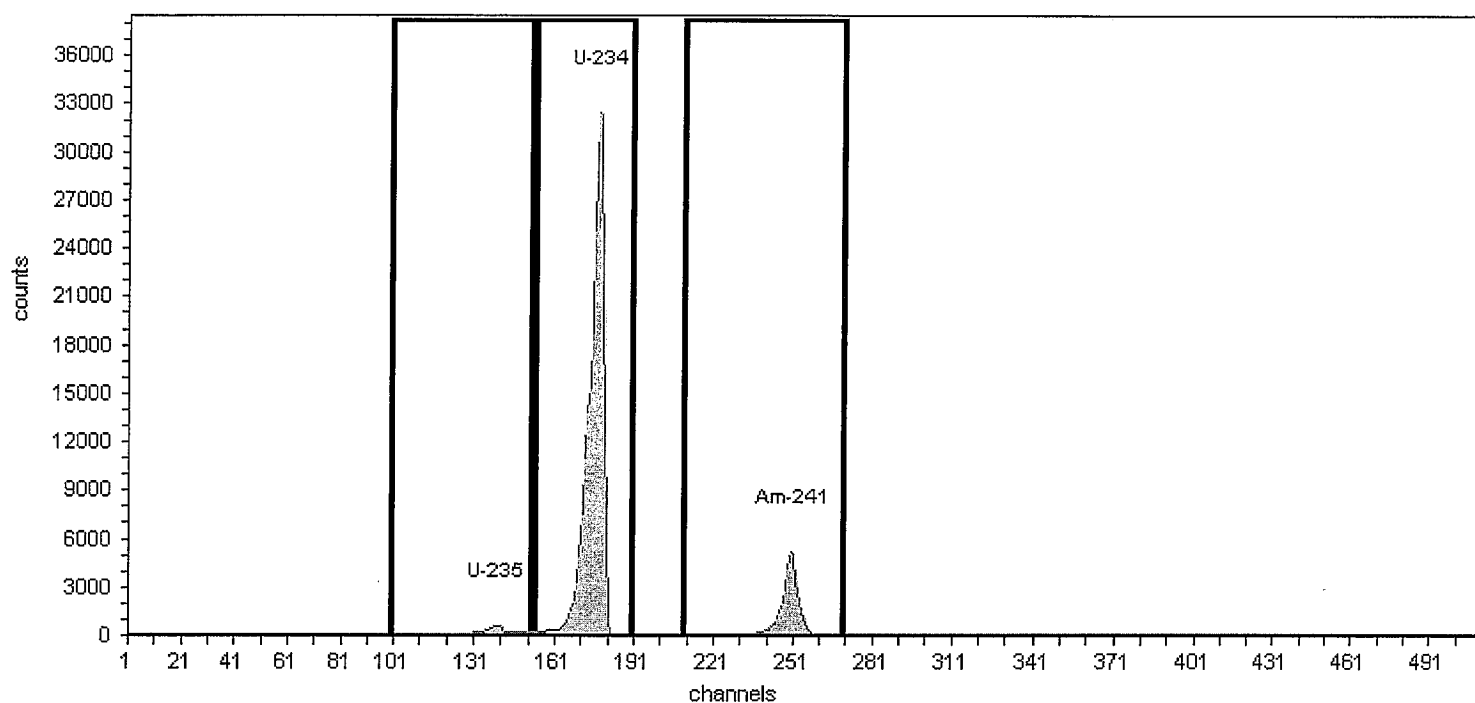
Energy Calibration Equation:

Gain = 9.8047 keV / Ch

Offset = 3,036.00 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 28.59% +/- 0.12% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	4,643.00	132.66
U-234	177	4.78	153	190	200,052.00	5,715.77
Am-241	250	5.49	210	270	31,922.00	912.06

Analyst: ORTEC

Detector: 25

Energy Calibration: RSO 190 (Source 9)

Description:

Certificate ID: A9 RSO#190

Prepared by: IPL

Description:

Calibration

Analysis Date: 5/21/2008 9:08:00AM

Calibration Type: Energy And Efficiency

Source Info

Certification Date: 6/1/2007 12:00:00PM

Acquisition

Detector: 25, SN:

Acquisition Start Date: 5/21/2008 8:31:01AM

Live Time: 35.00 min.

Real Time: 35.01 min.

Efficiency Calibration Name: RSO 190 (Source 9)

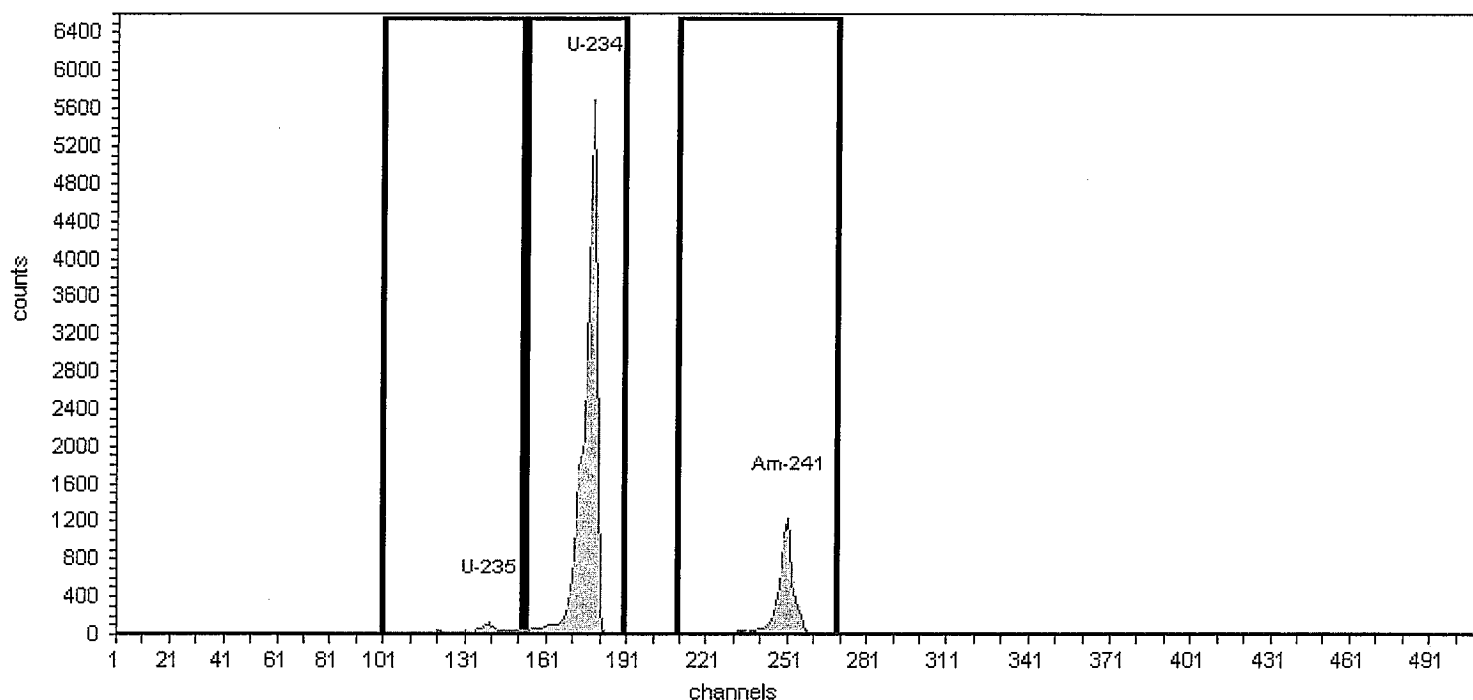
Energy Calibration Equation:

Gain = 9.8047 keV / Ch

Offset = 3,026.20 keV

Quadratic = 0.0000 keV / Ch²

Efficiency: 28.16% +/- 0.30% TPU(2 sigma)



Method: Interactive ROI

Algorithm: Linear

Initial Calibration: No

Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	140	4.40	100	152	781.00	22.31
U-234	178	4.78	153	190	29,575.00	845.00
Am-241	251	5.49	210	270	6,967.00	199.06

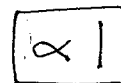


Isotope Products Laboratories

An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
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expires 5/20/09

*PAT 1873
recalibrated 4-15-03*

CERTIFICATE OF CALIBRATION MIXED ALPHA STANDARD SOURCE

Radionuclide A: U-234
Radionuclide B: U-235
Radionuclide C: Am-241
Half Life (U-234): $(2.454 \pm 0.006)E+05$ years
Half Life (U-235): $(7.037 \pm 0.011)E+08$ years
Half Life (Am-241): 432.17 ± 0.66 years

Customer: PARAGON ANALYTICS, INC.
P.O. No.: EW040203/R2193
Catalog No.: MISC-STD
Reference Date: 1-May-03 12:00 PST
Source No.: 92MIX2203026

Contained Radioactivity:

U-234:	3.354 nCi (124.1 Bq)	Am-241:	0.5793 nCi (21.43 Bq)
U-235:	0.06566 nCi (2.429 Bq)	Total Activity:	3.999 nCi (148.0 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Mar 1998.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	$\pm 0.7\%$
B. Type B (systematic) uncertainty:	$\pm 3.0\%$
C. Uncertainty in aliquot weighing:	$\pm 0.0\%$
D. Total uncertainty at the 99% confidence level:	$\pm 3.1\%$

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 4483 α /min in 2π on 11 Apr 03.

Daniel James Van Dalsem
Quality Control

15-Apr-03
Date Signed

IPL Ref. No.: 987-7

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24937 Avenue Tibbitts Valencia, California 91355

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24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

$\alpha 2$

reverified 5/20/08
expires 5/20/09

PAT 183
Recalibrated 4-15-03

CERTIFICATE OF CALIBRATION MIXED ALPHA STANDARD SOURCE

Radionuclide A: U-234
Radionuclide B: U-235
Radionuclide C: Am-241
Half Life (U-234): $(2.454 \pm 0.006)E+05$ years
Half Life (U-235): $(7.037 \pm 0.011)E+08$ years
Half Life (Am-241): 432.17 ± 0.66 years

Customer: PARAGON ANALYTICS, INC.
P.O. No.: EW040203/R2193
Catalog No.: MISC-STD
Reference Date: 1-May-03 12:00 PST
Source No.: 92MIX2203028

Contained Radioactivity:

U-234:	6.467 nCi (239.3 Bq)	Am-241:	0.6366 nCi (23.55 Bq)
U-235:	0.1135 nCi (4.200 Bq)	Total Activity:	7.217 nCi (267.1 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	$\pm 0.7\%$
B. Type B (systematic) uncertainty:	$\pm 3.0\%$
C. Uncertainty in aliquot weighing:	$\pm 0.0\%$
D. Total uncertainty at the 99% confidence level:	$\pm 3.1\%$

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 8091 α/min in 2π on 11 Apr 03.

Daniel James Van Dalsem
Quality Control

15-Apr-03
Date Signed

IPL Ref. No.: 987-7

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24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory

1800 North Keystone Street Burbank, California 91504



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An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

$\alpha 3$

reverified 5/20/08
expires 5/20/09

PAT I.D. 184
recalibrated 4-15-03

CERTIFICATE OF CALIBRATION MIXED ALPHA STANDARD SOURCE

Radionuclide A: U-234
Radionuclide B: U-235
Radionuclide C: Am-241
Half Life (U-234): $(2.454 \pm 0.006)E+05$ years
Half Life (U-235): $(7.037 \pm 0.011)E+08$ years
Half Life (Am-241): 432.17 ± 0.66 years

Customer: PARAGON ANALYTICS, INC.
P.O. No.: EW040203/R2193
Catalog No.: MISC-STD
Reference Date: 1-May-03 12:00 PST
Source No.: 92MIX2203024

Contained Radioactivity:

U-234: 3.227 nCi (119.4 Bq)
U-235: 0.05205 nCi (1.926 Bq)

Am-241: 2.866 nCi (106.0 Bq)
Total Activity: 6.145 nCi (227.3 Bq)

Physical description:

A. Capsule type: Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit: Electrodeposited and diffusion bonded oxides
C. Active Diameter: 19 mm
D. Backing: Stainless steel
E. Cover: None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty: $\pm 0.6\%$
B. Type B (systematic) uncertainty: $\pm 3.0\%$
C. Uncertainty in aliquot weighing: $\pm 0.0\%$
D. Total uncertainty at the 99% confidence level: $\pm 3.1\%$

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 6889 α/min in 2π on 11 Apr 03.

Daniel James Van Dalsem
Quality Control

15-Apr-03
Date Signed

IPL Ref. No.: 987-7

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24937 Avenue Tibbitts
Valencia, California 91355

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Fax 661•257•8303

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expires 5/20/09
 $\alpha 4$
PAI ID 00185
rec'd from recalibration
3-28-03

CERTIFICATE OF CALIBRATION ALPHA STANDARD SOURCE

Radionuclide A: U-234
Radionuclide B: U-235
Radionuclide C: Am-241
Half Life (U-234): $(2.454 \pm 0.006)E+05$ years
Half Life (U-235): $(7.037 \pm 0.011)E+08$ years
Half Life (Am-241): 432.17 ± 0.66 years

Customer: PARAGON ANALYTICS, INC.
P.O. No.: EW030603/R2155
Catalog No.: MISC-STD
Reference Date: 1-Apr-03 12:00 PST
Source No.: 92MIX2203021

Contained Radioactivity:

U-234:	2.731 nCi (101.0 Bq)	Am-241:	0.9325 nCi (34.50 Bq)
U-235:	0.03416 nCi (1.264 Bq)	Total Activity:	3.698 nCi (136.8 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	$\pm 0.8\%$
B. Type B (systematic) uncertainty:	$\pm 3.1\%$
C. Uncertainty in aliquot weighing:	$\pm 0.0\%$
D. Total uncertainty at the 99% confidence level:	$\pm 3.2\%$

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 4145 α /min in 2π on 18 Mar 03.

Daniel James Van Dalsem
Quality Control

19-Mar-03
Date Signed

IPL Ref. No.: 987-2

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24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory

1800 North Keystone Street Burbank, California 91504



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An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

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expires 5/20/09
α 5
PAI ID 00186
recalibration
received 186
3-28-03

CERTIFICATE OF CALIBRATION ALPHA STANDARD SOURCE

Radionuclide A: U-234
Radionuclide B: U-235
Radionuclide C: Am-241
Half Life (U-234): $(2.454 \pm 0.006)E+05$ years
Half Life (U-235): $(7.037 \pm 0.011)E+08$ years
Half Life (Am-241): 432.17 ± 0.66 years

Customer: PARAGON ANALYTICS, INC.
P.O. No.: EW030603/R2155
Catalog No.: MISC-STD
Reference Date: 1-Apr-03 12:00 PST
Source No.: 92MIX2203025

Contained Radioactivity:

U-234:	5.486 nCi (203.0 Bq)	Am-241:	3.958 nCi (146.4 Bq)
U-235:	0.09221 nCi (3.412 Bq)	Total Activity:	9.536 nCi (352.8 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.8%
B. Type B (systematic) uncertainty:	± 3.1%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.2%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 10690 α/min in 2π on 18 Mar 03.

Daniel James Van Dalsen
Quality Control

19-Mar-03
Date Signed

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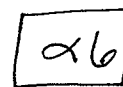


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24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303



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expires 5/20/09

PAID 00187
rec'd for recalibration
3-28-03

CERTIFICATE OF CALIBRATION ALPHA STANDARD SOURCE

Radionuclide A: U-234
Radionuclide B: U-235
Radionuclide C: Am-241
Half Life (U-234): $(2.454 \pm 0.006)E+05$ years
Half Life (U-235): $(7.037 \pm 0.011)E+08$ years
Half Life (Am-241): 432.17 ± 0.66 years

Customer: PARAGON ANALYTICS, INC.
P.O. No.: EW030603/R2155
Catalog No.: MISC-STD
Reference Date: 1-Apr-03 12:00 PST
Source No.: 92MIX2203022

Contained Radioactivity:

U-234:	3.592 nCi (132.9 Bq)	Am-241:	3.279 nCi (121.3 Bq)
U-235:	0.08556 nCi (3.166 Bq)	Total Activity:	6.957 nCi (257.4 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	$\pm 0.8\%$
B. Type B (systematic) uncertainty:	$\pm 3.1\%$
C. Uncertainty in aliquot weighing:	$\pm 0.0\%$
D. Total uncertainty at the 99% confidence level:	$\pm 3.2\%$

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 7799 α /min in 2π on 18 Mar 03.

Daniel James Van Dalsem
Quality Control

19-Mar-03
Date Signed

IPL Ref. No.: 987-2

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24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory

1800 North Keystone Street Burbank, California 91504



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An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

$\alpha 7$

reverified 5/20/08
expires 5/20/09

PAID 188
recd for recalibration
3-28-03

CERTIFICATE OF CALIBRATION ALPHA STANDARD SOURCE

Radionuclide A: U-234
Radionuclide B: U-235
Radionuclide C: Am-241
Half Life (U-234): $(2.454 \pm 0.006)E+05$ years
Half Life (U-235): $(7.037 \pm 0.011)E+08$ years
Half Life (Am-241): 432.17 ± 0.66 years

Customer: PARAGON ANALYTICS, INC.
P.O. No.: EW030603/R2155
Catalog No.: MISC-STD
Reference Date: 1-Apr-03 12:00 PST
Source No.: 92MIX2203023

Contained Radioactivity:

U-234:	2.895 nCi (107.1 Bq)	Am-241:	1.953 nCi (72.26 Bq)
U-235:	0.02502 nCi (0.9257 Bq)	Total Activity:	4.873 nCi (180.3 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	$\pm 0.8\%$
B. Type B (systematic) uncertainty:	$\pm 3.1\%$
C. Uncertainty in aliquot weighing:	$\pm 0.0\%$
D. Total uncertainty at the 99% confidence level:	$\pm 3.2\%$

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 5463 α /min in 2π on 18 Mar 03.

Daniel James Van Dalsem
Quality Control

19-Mar-03
Date Signed

IPL Ref. No.: 987-2



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24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

$\alpha 8$

reverified 5/20/08
expires 5/20/09

PAI ID 189
recd 4-21-03
recalibrated 4-15-03

CERTIFICATE OF CALIBRATION MIXED ALPHA STANDARD SOURCE

Radionuclide A: U-234
Radionuclide B: U-235
Radionuclide C: Am-241
Half Life (U-234): $(2.454 \pm 0.006)E+05$ years
Half Life (U-235): $(7.037 \pm 0.011)E+08$ years
Half Life (Am-241): 432.17 ± 0.66 years

Customer: PARAGON ANALYTICS, INC.
P.O. No.: EW040203/R2193
Catalog No.: MISC-STD
Reference Date: 1-May-03 12:00 PST
Source No.: 92MIX2203029

Contained Radioactivity:

U-234:	9.048 nCi (334.8 Bq)	Am-241:	1.433 nCi (53.02 Bq)
U-235:	0.1771 nCi (6.553 Bq)	Total Activity:	10.66 nCi (394.4 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Mar 1998.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	$\pm 0.5\%$
B. Type B (systematic) uncertainty:	$\pm 3.0\%$
C. Uncertainty in aliquot weighing:	$\pm 0.0\%$
D. Total uncertainty at the 99% confidence level:	$\pm 3.0\%$

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 11950 α/min in 2π on 11 Apr 03.


Quality Control

15-Apr-03
Date Signed

IPL Ref. No.: 987-7

ISO 9001 CERTIFIED



Eckert & Ziegler

Isotope Products

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010

Fax 661•257•8303

RSD # 190

Rec'd 6/6/07 GW

Recertification 6/11/07

CERTIFICATE OF CALIBRATION MIXED ALPHA STANDARD SOURCE

29

Radionuclide:	U-234	Customer:	PARAGON ANALYTICS, INC.
Radionuclide:	U-235	P.O. No.:	73179/R3768
Radionuclide:	Am-241	Catalog No.:	MISC-STD
Half-life (U-234):	(2.454 ± 0.006)E+05 years	Reference Date:	1-Jun-07 12:00 PST
Half-life (U-235):	(7.037 ± 0.011)E+08 years	Source No.:	92MIX223027
Half-life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	1.349	nCi,	49.91	Bq	Am-241:	0.3243	nCi,	12.00	Bq
U-235:	0.02970	nCi,	1.099	Bq	Total Activity:	1.703	nCi,	63.01	Bq

Physical Description:

A. Capsule type:	Disk (47 mm OD x 0.76 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxide
C. Active diameter/volume:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

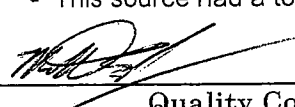
This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in May 2001.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.9 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.1 %

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 1909 α/min in 2π on 22-May-07


Quality Control

24 May 07
Date

IPL Ref. No.: 1143-19

ISO 9001 CERTIFIED

Medical Imaging Laboratory

24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory 133 of 133

1800 North Keystone Street Burbank, California 91504



RESUBMISSION

Radium-226

Case Narrative


Freeport McMoRan Sierrita

FMI-VRP

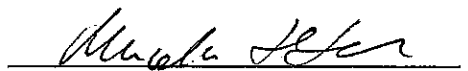
Work Order Number: 0812177

1. This report consists of the analytical results and supporting documentation for thirteen soil samples received by ALS Paragon on 12/17/08.
2. These samples were prepared and analyzed according to procedures SOP783R8. The analyses were completed on 03/12/09.
3. The analysis results for these samples are reported on a 'dry weight' basis in units of pCi/gram.
4. No anomalous situations were encountered during the preparation or analysis of these samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.


Jean Anderson
Radiochemistry Primary Data Reviewer

12/04/12
Date


Radiochemistry Final Data Reviewer

12-4-12
Date



Section 1

CHAIN OF CUSTODY

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812177

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-SD-01-0-1.5	0812177-1		SOIL	16-Jul-08	8:30
CP-SD-03-1.5-3.0	0812177-10		SOIL	16-Jul-08	9:54
CP-P07-1-3	0812177-11		SOIL	17-Jul-08	14:04
CP-P07-0-1	0812177-12		SOIL	17-Jul-08	14:04
CP-P07-5-7	0812177-13		SOIL	17-Jul-08	14:11
CP-SD-04-0-1.5	0812177-14		SOIL	17-Jul-08	14:52
CP-SD-04-1.5-3.0	0812177-15		SOIL	17-Jul-08	14:52
CP-Q09-1-3	0812177-16		SOIL	23-Jul-08	10:15
CP-SD-09-0-1.5	0812177-17		SOIL	28-Jul-08	10:39
CD-SD-09-1.5-3.0	0812177-18		SOIL	28-Jul-08	10:39
CP-P12-1-3	0812177-19		SOIL	23-Jul-08	11:03
CP-SD-01-1.5-3.0	0812177-2		SOIL	16-Jul-08	8:30
OD-SD-02-0-1.5	0812177-20		SOIL	28-Jul-08	11:11
CP-SD-02-0-1.5	0812177-3		SOIL	16-Jul-08	9:08
CP-SD-02-1.5-3.0	0812177-4		SOIL	16-Jul-08	9:08
CP-SD-06-0-1.5	0812177-5		SOIL	16-Jul-08	9:26
CP-SD-06-1.5-3.0	0812177-6		SOIL	16-Jul-08	9:26
CP-SD-05-0-1.5	0812177-7		SOIL	16-Jul-08	9:45
CP-SD-05-1.5-3.0	0812177-8		SOIL	16-Jul-08	9:45
CP-SD-03-0-1.5	0812177-9		SOIL	16-Jul-08	9:54



**PARAGON
ANALYTICS**

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 1 of 2

Project Name/No.: FMI-VIRP Sampler(s): K. Walsh Turnaround (circle one): Standard or Rush (Due) Dispose: Date 12/15/08 or Return to Client

Report To: Steven Vaughn

Phone: (520) 407-2845

Fax:

E-mail: Steven.Vaughn@paragoncorp.com

Company: Freeport McMoran

Address: Green Valley, AZ 85614

6200 W Duval Ave Rd.

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-SD-01-0-1.5	7/16/08	830	①	S	n/a	1
CP-SD-01-1.5-3.0	7/16/08	830	②	S	n/a	1
CP-SD-02-0-1.5	7/16/08	908	③	S	n/a	1
CP-SD-02-1.5-3.0	7/16/08	908	④	S	n/a	1
CP-SD-06-0-1.5	7/16/08	926	⑤	S	n/a	1
CP-SD-06-1.5-3.0	7/16/08	926	⑥	S	n/a	1
CP-SD-05-0-1.5	7/16/08	945	⑦	S	n/a	1
CP-SD-05-1.5-3.0	7/16/08	945	⑧	S	n/a	1
CP-SD-03-0-1.5	7/16/08	954	⑨	S	n/a	1
CP-SD-03-1.5-3.0	7/16/08	954	⑩	S	n/a	1

* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter		Relinquished By: (1)		Relinquished By: (2)	
Signature <u>K. Walsh</u>		Signature _____		Signature _____	
Printed Name <u>Kevin Walsh</u>		Printed Name _____		Printed Name _____	
Date <u>12/15/08</u>		Date _____		Date _____	
Time <u>1600</u>		Time _____		Time _____	
Company <u>URS</u>		Company _____		Company _____	
Received By: <u>Cheryl Trimble</u>		Received By: _____		Received By: _____	
Signature <u>Cheryl Trimble</u>		Signature _____		Signature _____	
Printed Name <u>Cheryl Trimble</u>		Printed Name _____		Printed Name _____	
Date <u>12-17-08</u>		Date _____		Date _____	
Time <u>1045</u>		Time _____		Time _____	
Company <u>ALS Paragon</u>		Company _____		Company _____	

Order No. 0548 VT

Trk # 7971 87199884



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 2 of 2

Project Name/No.: FMI-VRP		Sampler(s): K. Walsh		Turnaround (circle one): <u>Standard</u> or Rush (Due _____)		Dispose Date <u>60 day</u> or Return to Client _____	
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: E-mail: Steven.Vaughn@urscorp.com Company: Freeport Mc Moran Address: 6200 W David (near Rte 20) Green Valley, AZ 85614							
Circle method (right); provide additional information as needed (comments).							
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers	
CP-P07-1-3	7/17/08	1404	11	S	N/A	1	
CP-P07-0-1	7/17/08	1404	13	S	N/A	1	
CP-P07-5-7	7/17/08	1411	13	S	N/A	1	
CP-SD-04-0-1.5	7/17/08	1452	14	S	N/A	1	
CP-SD-04-1.5-3.0	7/17/08	1452	15	S	N/A	1	
CP-C09-1-3	7/23/08	1015	16	S	N/A	1	
CP-SD-09-0-1.5	7/23/08	1034	17	S	N/A	1	
CP-SD-09-1.5-3.0	7/23/08	1039	18	S	N/A	1	
CP-P12-1-3	7/23/08	1103	19	S	N/A	1	
OD-SD-02-0-1.5	7/23/08	1111	20	S	N/A	1	
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter							
Comments: Order No. 0508 VT							
Relinquished By: Signature: <u>K. Walsh</u> Printed Name: <u>Kevin Walsh</u> Date: <u>12/15/08</u> Time: <u>1600</u> Company: <u>URS</u>							
Relinquished By: Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____							
Received By: Signature: <u>Cheryl Trimble</u> Printed Name: <u>Cheryl Trimble</u> Date: <u>12-17-08</u> Time: <u>1045</u> Company: <u>ALS Paragon</u>							
Received By: Signature: _____ Printed Name: _____ Date: _____ Time: _____ Company: _____							

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812177Project Manager: JEInitials: COTDate: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>14</u>		
Background µR/hr reading: <u>13</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO / NA (If no. see Form 008.)		

DOT
Survey/
Acceptance
Information

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO ☒ NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE 12/20/08

*IR Gun #2: Oakton, SN 29922500201-0066

IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/20/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

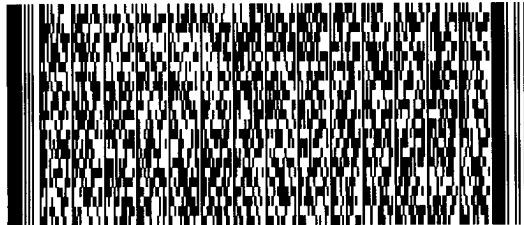
Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #



LL1E180

1-7/1

4 of 4 WED - 17DEC AA
STANDARD OVERNIGHT

MPS# 7971 8719 9884

0263

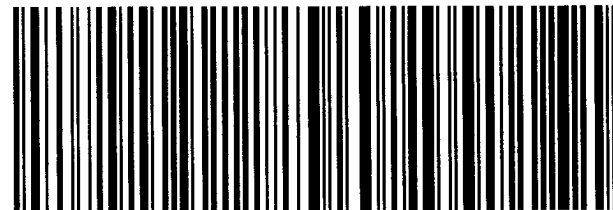
Mstr# 7971 8719 9690 0201

XH FTCA

80524

CO-US

DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



Section 2

2

SAMPLE RESULTS SUMMARY

Ra-226 by Radon Emanation - Method 903.1 Sample Results Summary

Client Name: Freeport McMoRan Sierrita
Client Project Name: FMI-VRP
Client Project Number:
Laboratory Name: ALS Environmental -- FC
PAI Work Order: 0812177

Page: 1 of 2
Reported on: Monday, December 03, 2012
2:12:19 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-1	CP-SD-01-0-1.5	Sample	Ra-226	2.1 +/- 0.61	0.41	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-4	CP-SD-02-1.5-3.0	Sample	Ra-226	1.5 +/- 0.47	0.35	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-8	CP-SD-05-1.5-3.0	Sample	Ra-226	2.3 +/- 0.61	0.060	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-9	CP-SD-03-0-1.5	Sample	Ra-226	2.8 +/- 0.79	0.094	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-11	CP-P07-1-3	Sample	Ra-226	4.8 +/- 1.2	0.71	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-12	CP-P07-0-1	Sample	Ra-226	2.8 +/- 0.69	0.30	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-13	CP-P07-5-7	Sample	Ra-226	1.3 +/- 0.44	0.33	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-14	CP-SD-04-0-1.5	Sample	Ra-226	0.77 +/- 0.31	0.065	pCi/g	SOIL	RE090203-4	2/24/2009	LT
0812177-15	CP-SD-04-1.5-3.0	Sample	Ra-226	1.4 +/- 0.49	0.46	pCi/g	SOIL	RE090203-4	2/24/2009	

Comments:

Data Package ID: RE0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration
- BDL - Below Detection Limit

Ra-226 by Radon Emanation - Method 903.1 Sample Results Summary

Client Name: Freeport McMoRan Sierfita
Client Project Name: FMI-VRP
Client Project Number:
Laboratory Name: ALS Environmental -- FC
PAI Work Order: 0812177

Page: 2 of 2
Reported on: Monday, December 03, 2012
2:12:19 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-17	CP-SD-09-0-1.5	Sample	Ra-226	3.0 +/- 0.76	0.26	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-18	CD-SD-09-1.5-3.0	Sample	Ra-226	1.6 +/- 0.55	0.42	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-19	CP-P12-1-3	Sample	Ra-226	1.9 +/- 0.65	0.58	pCi/g	SOIL	RE090203-4	2/24/2009	
0812177-20	OD-SD-02-0-1.5	Sample	Ra-226	1.9 +/- 0.61	0.58	pCi/g	SOIL	RE090220-1	3/11/2009	

Comments:

Data Package ID: RE0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration
- BDL - Below Detection Limit



Section 3

QC RESULTS SUMMARY



Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-1MB

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.14 +/- 0.24	0.41	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

ALS Paragon
LIMS Version: 6.250A

Page 1 of 2

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-4MB

Sample Matrix: SOIL

Prep Batch: RE090203-4

Final Aliquot: 1.01 g

Prep SOP: PAI 783 Rev 8

QCBatchID: RE090203-4-1

Result Units: pCi/g

Date Collected: 03-Feb-09

Run ID: RE090203-4A

File Name: Manual Entry

Date Prepared: 03-Feb-09

Count Time: 15 minutes

Date Analyzed: 24-Feb-09

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	-0.16 +/- 0.38	0.72	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RE0812177-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090203-4LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 03-Feb-09

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Final Aliquot: 1.01 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	47.5 +/- 8.69	0.366	44.6	107	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RE090220-1LCS

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 20-Feb-09

Date Prepared: 20-Feb-09

Date Analyzed: 12-Mar-09

Prep Batch: RE090220-1

QCBatchID: RE090220-1-1

Run ID: RE090220-1A

Count Time: 15 minutes

Final Aliquot: 1.04 g

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	48.8 +/- 9.05	0.403	43.3	113	57 - 126	P

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

ALS Paragon

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Duplicate Sample Results (DER)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5

Lab ID: 0812177-1DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 16-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Analyte	Sample Result +/- 2s TPU	Duplicate Result +/- 2s TPU	DER	Control Limit	Lab Qualifiers
13982-63-3	Ra-226	2.1 +/- 0.61	1.8 +/- 0.50	0.32	2.13	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

DER - Duplicate Error Ratio (see PAI SOP 715)

BDL - Below Detection Limit

NR - Not Reported

Data Package ID: RE0812177-1

Date Printed: Saturday, March 14, 2009

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Section 4

INDIVIDUAL SAMPLE RESULTS

4

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-SD-01-0-1.5
Lab ID:	0812177-1

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 16-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.1 +/- 0.61	0.41	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8

Sample Duplicate Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-SD-01-0-1.5

Lab ID: 0812177-1DUP

Sample Matrix: SOIL

Prep SOP: PAI 783 Rev 8

Date Collected: 16-Jul-08

Date Prepared: 03-Feb-09

Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4

QCBatchID: RE090203-4-1

Run ID: RE090203-4A

Count Time: 15 minutes

Report Basis: Dry Weight

Final Aliquot: 1.02 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.8 +/- 0.50	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

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Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-02-1.5-3.0	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-4	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 16-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.5 +/- 0.47	0.35	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-SD-05-1.5-3.0
Lab ID:	0812177-8

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 16-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.3 +/- 0.61	0.060	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-SD-03-0-1.5
Lab ID:	0812177-9

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 16-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.79	0.094	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-P07-1-3	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.02 g
Lab ID: 0812177-11	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 17-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	4.8 +/- 1.2	0.71	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P07-0-1
Lab ID:	0812177-12

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	2.8 +/- 0.69	0.30	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P07-5-7
Lab ID:	0812177-13

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 17-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.3 +/- 0.44	0.33	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-04-0-1.5	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.00 g
Lab ID: 0812177-14	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 17-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.77 +/- 0.31	0.065	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-04-1.5-3.0	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-15	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 17-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.4 +/- 0.49	0.46	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: CP-SD-09-0-1.5	Sample Matrix: SOIL	Prep Batch: RE090203-4	Final Aliquot: 1.01 g
Lab ID: 0812177-17	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090203-4-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: RE090203-4A	Moisture(%): NA
	Date Prepared: 03-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 24-Feb-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	3.0 +/- 0.76	0.26	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CD-SD-09-1.5-3.0
Lab ID:	0812177-18

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 28-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.6 +/- 0.55	0.42	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID:	CP-P12-1-3
Lab ID:	0812177-19

Sample Matrix: SOIL
Prep SOP: PAI 783 Rev 8
Date Collected: 23-Jul-08
Date Prepared: 03-Feb-09
Date Analyzed: 24-Feb-09

Prep Batch: RE090203-4
QCBatchID: RE090203-4-1
Run ID: RE090203-4A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.01 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.65	0.58	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 8 Sample Results

Lab Name: ALS Paragon
Work Order Number: 0812177
Client Name: Freeport McMoRan Sierrita
ClientProject ID: FMI-VRP

Field ID: OD-SD-02-0-1.5	Sample Matrix: SOIL	Prep Batch: RE090220-1	Final Aliquot: 1.02 g
Lab ID: 0812177-20	Prep SOP: PAI 783 Rev 8	QCBatchID: RE090220-1-1	Prep Basis: Dry Weight
	Date Collected: 28-Jul-08	Run ID: RE090220-1A	Moisture(%): NA
	Date Prepared: 20-Feb-09	Count Time: 15 minutes	Result Units: pCi/g
	Date Analyzed: 11-Mar-09	Report Basis: Dry Weight	File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	1.9 +/- 0.61	0.58	1	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
Y2 - Chemical Yield outside default limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)
BDL - Below Detection Limit

Data Package ID: RE0812177-1



Section 5

RAW DATA

5

Ra-226 by Radon Emanation - Method 903.1 Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 783

Reported on: Tuesday, February 24, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 783

4:31:36 PM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist	Samp Aliq Analy Aliq	Inst ID Det ID	AnlRunID File Name	Count Date/Time	Gr Cnts Bkg Cnts	BaseEff ProgEff	CntDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
0812177-1	Ra-226 Trg. Analyte	7/16/2008 8:30:00 AM	RE090203-4 RE090203-4-1	2/13/2009 1:12:00 PM	2/24/2009 10:41:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin B10	RE090203-4A Manual Entry	2/24/2009 2:58 PM	97,000 10,000	151.66% NA	15 NA	2.1 0.61	0.41 NA	pCi/g Dry Weight	NA NA	NA
0812177-1	Ra-226 Trg. Analyte	7/16/2008 8:30:00 AM	RE090203-4 RE090203-4-1	2/13/2009 1:12:00 PM	2/24/2009 10:41:00 AM	SOIL NA	1.02 g 1.02 g	Alpha Scin C25	RE090203-4A Manual Entry	2/24/2009 2:58 PM	127,000 15,000	219.68% NA	15 NA	1.8 0.50	0.33 NA	pCi/g Dry Weight	0.32 NA	NA
0812177-4	Ra-226 Trg. Analyte	7/16/2008 9:08:00 AM	RE090203-4 RE090203-4-1	2/13/2009 1:12:00 PM	2/24/2009 10:41:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin D26	RE090203-4A Manual Entry	2/24/2009 2:58 PM	89,000 11,000	187.17% NA	15 NA	1.5 0.47	0.35 NA	pCi/g Dry Weight	NA NA	NA
0812177-8	Ra-226 Trg. Analyte	7/16/2008 9:45:00 AM	RE090203-4 RE090203-4-1	2/13/2009 1:12:00 PM	2/24/2009 10:41:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin F43	RE090203-4A Manual Entry	2/24/2009 2:58 PM	104,000 0,000	161.43% NA	15 NA	2.3 0.61	0.060 NA	pCi/g Dry Weight	NA NA	NA
0812177-9	Ra-226 Trg. Analyte	7/16/2008 9:54:00 AM	RE090203-4 RE090203-4-1	2/13/2009 1:12:00 PM	2/24/2009 10:41:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin A44	RE090203-4A Manual Entry	2/24/2009 2:58 PM	80,000 0,000	103.69% NA	15 NA	2.8 0.79	0.094 NA	pCi/g Dry Weight	NA NA	NA
0812177-11	Ra-226 Trg. Analyte	7/17/2008 2:04:00 PM	RE090203-4 RE090203-4-1	2/13/2009 1:12:00 PM	2/24/2009 11:06:00 AM	SOIL NA	1.02 g 1.02 g	Alpha Scin B12	RE090203-4A Manual Entry	2/24/2009 3:16 PM	150,000 14,000	100.86% NA	15 NA	4.8 1.2	0.71 NA	pCi/g Dry Weight	NA NA	NA
0812177-12	Ra-226 Trg. Analyte	7/17/2008 2:04:00 PM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:06:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin C27	RE090203-4A Manual Entry	2/24/2009 3:16 PM	154,000 8,000	190.09% NA	15 NA	2.8 0.69	0.30 NA	pCi/g Dry Weight	NA NA	NA
0812177-13	Ra-226 Trg. Analyte	7/17/2008 2:11:00 PM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:06:00 AM	SOIL NA	1 g 1 g	Alpha Scin D28	RE090203-4A Manual Entry	2/24/2009 3:16 PM	60,000 6,000	152.80% NA	15 NA	1.3 0.44	0.33 NA	pCi/g Dry Weight	NA NA	NA
0812177-14	Ra-226 Trg. Analyte	7/17/2008 2:52:00 PM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:06:00 AM	SOIL NA	1 g 1 g	Alpha Scin F45	RE090203-4A Manual Entry	2/24/2009 3:16 PM	32,000 0,000	149.37% NA	15 NA	0.77 0.31	0.065 NA	pCi/g Dry Weight	NA NA	LT
0812177-15	Ra-226 Trg. Analyte	7/17/2008 2:52:00 PM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:22:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin B14	RE090203-4A Manual Entry	2/24/2009 3:34 PM	83,000 17,000	169.73% NA	15 NA	1.4 0.49	0.46 NA	pCi/g Dry Weight	NA NA	NA
0812177-17	Ra-226 Trg. Analyte	7/28/2008 10:39:00 AM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:22:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin C30	RE090203-4A Manual Entry	2/24/2009 3:34 PM	129,000 3,000	150.56% NA	15 NA	3.0 0.76	0.26 NA	pCi/g Dry Weight	NA NA	NA

Comments:

Data Package ID: RE0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
+ - Duplicate RPD not within limits.
LT - Result is less than Request MDC, greater than sample specific MDC
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
NC - Not Calculated for duplicate results less than 5 times MDC
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).
2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte
TPU - Total Propagated Uncertainty
MDC - Minimum Detectable Concentration
DER - Duplicate Error Ratio
BDL - Below Detection Limit

Ra-226 by Radon Emanation - Method 903.1 Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 783

Reported on: Tuesday, February 24, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 783

4:31:36 PM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC BatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Gr Cnts Bkg Cnts	BaseEff ProgEff	CndDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
0812177-18	Ra-226 Trg. Analyte	7/28/2008 10:39:00 AM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:22:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin D31	RE090203-4A Manual Entry	2/24/2009 3:34 PM	69,000 8,000	134.44% NA	15 NA	1.6 0.55	0.42 NA	pCi/g Dry Weight	NA NA	NA
0812177-19	Ra-226 Trg. Analyte	7/23/2008 11:03:00 AM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:42:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin B1	RE090203-4A Manual Entry	2/24/2009 3:50 PM	79,000 14,000	122.42% NA	15 NA	1.9 0.65	0.58 NA	pCi/g Dry Weight	NA NA	NA
0812177-20	Ra-226 Trg. Analyte	7/28/2008 11:11:00 AM	RE090220-1 RE090220-1-1	3/02/2009 12:40:00 PM	3/11/2009 11:31:00 AM	SOIL NA	1.02 g 1.02 g	Alpha Scin B10	RE090220-1A Manual Entry	3/11/2009 4:48 PM	128,000 32,000	190.20% NA	15 NA	1.9 0.61	0.58 NA	pCi/g Dry Weight	NA NA	NA
RE090203-4	Ra-226 Trg. Analyte	2/3/2009 1:24:57 PM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:42:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin C20	RE090203-4A Manual Entry	2/24/2009 3:50 PM	22,000 28,000	134.54% NA	15 NA	-0.16 0.38	0.72 NA	pCi/g Dry Weight	NA NA	U
RE090203-4	Ra-226 Trg. Analyte	2/3/2009 1:24:57 PM	RE090203-4 RE090203-4-1	2/13/2009 1:32:00 PM	2/24/2009 11:42:00 AM	SOIL NA	1.01 g 1.01 g	Alpha Scin	RE090203-4A	2/24/2009 4:06 PM	2540,000 13,000	189.97% NA	15 NA	47.5 8.69	0.366 NA	pCi/g Dry Weight	NA NA	107 P
RE090220-1	Ra-226 Trg. Analyte	2/20/2009 12:41:17 PM	RE090220-1 RE090220-1-1	3/02/2009 1:43:00 PM	3/12/2009 10:01:00 AM	SOIL NA	1.04 g 1.04 g	Alpha Scin D27	RE090220-1A Manual Entry	3/12/2009 2:08 PM	12,000 7,000	129.70% NA	15 NA	0.14 0.24	0.41 NA	pCi/g Dry Weight	NA NA	U
RE090220-1	Ra-226 Trg. Analyte	2/20/2009 12:41:17 PM	RE090220-1 RE090220-1-1	3/02/2009 1:43:00 PM	3/12/2009 10:19:00 AM	SOIL NA	1.04 g 1.04 g	Alpha Scin F47	RE090220-1A Manual Entry	3/12/2009 2:21 PM	1594,000 5,000	116.33% NA	15 NA	48.8 9.05	0.403 NA	pCi/g Dry Weight	NA NA	113 P

Comments:

Data Package ID: RE0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
+ - Duplicate RPD not within limits.
LT - Result is less than Request MDC, greater than sample specific MDC
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).
2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

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Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
Check Source	N/A	K	Th	NA						2/24/09	9:20	982	1	OK
↓	↓	7A	↓	↓						↓	9:31	934	↓	OK
081176-10	REG-03-4	2B	8	3	2/24/09	9:23	6	15	OK	2/24/09	14:23	51	13	OK
-10up		6C	21	4			3		OK			69		OK
-1075		5D	22	4			9		OK			1837		OK
-11		1F	49	4			1		OK			27		OK
-13		7A	50	4			3		OK			86		OK
-14		2B	9	3		9:48	10		OK		14:41	87		OK
-15		6C	23	4			3		OK			167		OK
-16		5D	24	4			3		OK			132		OK
-17		1F	51	4			3		OK			27		OK
-18		7A	41	5			6		OK			68		OK
081177-1		2B	10	3		10:10	10		OK		14:38	97		OK
-10up		6C	25	4			13		OK			127		OK
-4		5D	26	4			11		OK			89		OK
-8		1F	43	5			0		OK			104		OK
-9		7A	44	5			0		OK			80		OK
-11		2B	12	3		10:32	4		OK		15:16	150		OK
-12		6C	27	4			8		OK			154		OK
-13		5D	28	4			0		OK			60		OK
-14		1F	45	5			0		OK			32		OK
-15		2B	14	3		10:52	17		OK		15:34	83		OK
-17		6C	30	4			3		OK			189		OK

Comments:

Form 7953.xls (11/14/05)

Reviewed by/date:

OK 2/24/09

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
0811171-18	RE090203-4	5D	31	4	2/24/69	6:22	8	15	OK	2/24/69	15:34	69	15	OK
↓ -19	↓	2B	1	4	↓	11:11	14	↓	OK	↓	15:50	79	↓	OK
RE090203-47B	↓	6C	20	5	↓	↓	28	↓	OK	↓	↓	22	↓	OK
↓ 65	↓	2B	2	4	↓	11:26	13	↓	OK	↓	16:06	240	↓	OK
Check Source	NA	3C	Th	NA	↓	↓	↓	↓	→	2/24/69	16:08	954	↓	OK
↓	↓	2B	↓	↓	↓	↓	↓	↓	→	↓	16:21	9423	↓	OK
↓	↓	6C	↓	↓	↓	↓	↓	↓	→	↓	16:09	9703	↓	OK
↓	↓	5D	↓	↓	↓	↓	↓	↓	→	↓	16:10	9683	↓	OK
↓	↓	1F	↓	↓	↓	↓	↓	↓	→	↓	16:11	9462	↓	OK
↓	↓	7A	↓	↓	↓	↓	↓	↓	→	↓	16:12	9624	↓	OK
<div>2B</div> <div>6C</div> <div>5D</div> <div>1F</div> <div>7A</div>														

3 Comments:

6
7
8
9
10
11

Form 795r3.xls (11/14/05)

Reviewed by/date:

OK 2/14/69

370093

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
RE090220-5NB	RE090220-5	20	8	1	3/11/09	9:43	28	15	OK	3/11/09	14:43	13	15	OK
↓ 65		6C	26	1			36	↓	OK			20:16	↓	OK
0902058-6	RE090214-1	30	27	1			68	30	OK			23:58	30	OK
0902075-1		1F	46	1			45		OK			38		OK
0902084-2		7A	47	1			38		OK			47:47		OK
↓ -3		20	9	1		10:14	34		OK			32		OK
RE090214-1NB		1F	49	1			17	↓	OK			8	↓	OK
0812177-20	RE090220-1	20	10	1		10:59	32	15	OK			158	15	OK
0812178-2		20	12	1		11:15	11	↓	OK			99		OK
↓ -3		20	14	1	✓	11:33	18	↓	OK			29	↓	OK
Check Source	N/A	3F	Th	N/A						3/11/09	16:30	993	1	OK
		20									17:35	953		OK
		6C									16:31	986		OK
		30									16:32	9472		OK
		1F									16:33	9475		OK
		7A									16:34	9458		OK
Check Source	N/A	3F	Th	N/A						3/12/09	8:11	997	1	OK
		20									8:12	9326		OK
		6C									8:13	9510		OK
		30									8:14	9485		OK
		1F									8:15	9322		OK
		7A									8:16	9320		OK
0812178-4	RE090220-1	20	1	2	3/12/09	8:19	11	15	OK	3/12/09	12:48	82	15	OK

3 Comments:

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Form 795r3.xls (11/14/05)

Reviewed by/date:

OK 3/11/09

370094

Logbook No./Page

Sample Count

Background Count										Sample Count					
Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Start			Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time	Date				Time				
058K178-40up	RE09220-1	6C	20	2	3/12/09	8:19	11	15	OK	3/12/09	12:48	85	15	OK	
-5		5D	21	1			18		OK		↓	39		OK	
-6		IF	40	2			4		OK		13:01	37		OK	
-7		7A	41	2		↓	9		OK		↓	27		OK	
-8		2B	2	2		8:38	23		OK		13:10	167		OK	
-10		6C	22	2			17		OK		↓	105		OK	
-11		5D	23	2			10		OK		↓	84		OK	
-14		IF	43	2		↓	3		OK		13:27	85		OK	
-17		7A	44	2			3		OK		↓	1454		OK	
-1705		2B	4	2		8:58	10		OK		↓	88		OK	
08K177-2		6C	24	2			6		OK		13:34	87		OK	
-3		5D	25	1			31		OK		↓	163		OK	
-4		IF	45	2			10		OK		13:48	112		OK	
-40up		7A	46	2		↓	3		OK		↓	46		OK	
0902605-1		2B	7	2		9:16	8		OK		↓	26		OK	
-2		6C	8	2		9:33	10		OK		14:08	36		OK	
-3		5D	26	2			37		OK		↓	12		OK	
RE09220-170B		IF	27	2			7		OK		14:21	1594		OK	
090694-5	RE09220-8	7A	47	2		↓	3		OK		↓	134		OK	
-6		2B	9	2		9:50	8		OK		14:29	138		OK	
-7		IF	50	2			3		OK		14:38	83		OK	
-70up		7A	51	2		↓	37		OK		↓	134		OK	

Comments:

OK 3/11/09

Reviewed by/date:

370095

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos.	Start		Counts	Dur. (min.)	Pos.
					Date	Time				Date	Time			
0906084-4	REC09020-8	2B	10	3	3/12/09	10:06	17	15	DBC	7/11/09	14:47	55	15	DBC
↓ -5	↓	2B	12	2	↓	10:12	10	↓	DBC	↓	15:02	147	↓	DBC
↓ -6	↓	2B	14	2	↓	10:17	9	↓	DBC	↓	15:11	117	↓	DBC
Check Source	N/A	3E	TH	N/A	↓	↓	↓	↓	↓	3/12/09	15:01	9344	↓	DBC
↓	↓	2B	↓	↓	↓	↓	↓	↓	↓	↓	15:43	860	↓	DBC
↓	↓	6C	↓	↓	↓	↓	↓	↓	↓	↓	15:02	9465	↓	DBC
↓	↓	5D	↓	↓	↓	↓	↓	↓	↓	↓	15:03	9407	↓	DBC
↓	↓	1F	↓	↓	↓	↓	↓	↓	↓	↓	15:04	9510	↓	DBC
↓	↓	7A	↓	↓	↓	↓	↓	↓	↓	↓	15:05	9439	↓	DBC
Check Source	N/A	3E	TH	N/A	↓	↓	↓	↓	↓	3/13/09	6:55	9282	↓	8
↓	↓	2B	↓	↓	↓	↓	↓	↓	↓	↓	6:57	91689	↓	8
↓	↓	6C	↓	↓	↓	↓	↓	↓	↓	↓	6:59	9509	↓	8
↓	↓	5D	↓	↓	↓	↓	↓	↓	↓	↓	7:00	9428	↓	8
↓	↓	1F	↓	↓	↓	↓	↓	↓	↓	↓	7:03	9454	↓	8
↓	↓	7A	↓	↓	↓	↓	↓	↓	↓	↓	7:04	9517	↓	8
0906084-6/DS	REC09020-8	2B	1	3	3/13/09	7:09	14	15	DBC	↓	↓	↓	↓	↓
↓ -7	↓	6C	21	2	↓	↓	8	↓	DBC	↓	↓	↓	↓	↓
↓ -8	↓	5D	25	2	↓	↓	12	↓	DBC	↓	↓	↓	↓	↓
↓ -9	↓	1F	40	3	↓	↓	1	↓	DBC	↓	↓	↓	↓	↓
REC09020-8/1B	↓	7A	41	3	↓	↓	3	↓	DBC	↓	↓	↓	↓	↓
↓ WS	↓	2B	2	3	↓	7:26	13	↓	DBC	↓	↓	↓	↓	↓
0906084-1	REC09020-7	6C	20	↓	↓	↓	15	↓	DBC	↓	↓	↓	↓	↓
↓ -5	↓	5D	22	↓	↓	↓	8	↓	DBC	↓	↓	↓	↓	↓

Comments:

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Form 7953.xls (11/14/05)

Reviewed by/date:

DBC 3/13/09



Section 6

QUALITY ASSURANCE SUMMARY REPORTS

6



Section 7

LABORATORY BENCH SHEETS



Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: RE090203-4

Prep Procedure: Ra226_RnE

Analytical QASS / NCR? Y / *NA*

Prep Num	Labid	QC Type	Init Aliq	Fin Aliq	Units	Report Units	Cnt Date Time	Detector ID	Flask ID	Total Bkg Counts	Efficiency	Count Duration	Gross Counts	Notes
1	0812176-10	SMP	1.0001	1.0001	g	pCi/g	14:23	203	8	6	1.6923	15	81	
1	0812176-10	DUP	1.0089	1.0089	g	pCi/g		6C	21	3	1.5742		69	
1	0812176-10	MS	1.0107	1.0107	g	pCi/g		5D	22	9	1.3192		1837	
1	0812176-11	SMP	1.007	1.007	g	pCi/g		1F	49	1	1.4451		27	
1	0812176-13	SMP	1.0065	1.0065	g	pCi/g		7A	50	3	0.9484		86	
1	0812176-14	SMP	1.0066	1.0066	g	pCi/g	14:41	20	9	10	0.7866		87	
1	0812176-15	SMP	1.0056	1.0056	g	pCi/g		6C	23	3	1.7894		167	
1	0812176-16	SMP	1.0077	1.0077	g	pCi/g		5D	24	3	1.952		132	
1	0812176-17	SMP	1.0084	1.0084	g	pCi/g		1F	51	2	1.6593		27	
1	0812176-18	SMP	1.0137	1.0137	g	pCi/g		7A	41	6	1.0674		68	
1	0812177-1	SMP	1.0054	1.0054	g	pCi/g	14:58	20	10	10	1.3166		97	
1	0812177-1	DUP	1.0184	1.0184	g	pCi/g		6C	25	13	2.1968		127	
1	0812177-4	SMP	1.0089	1.0089	g	pCi/g		5D	26	11	1.8717		89	
1	0812177-8	SMP	1.0095	1.0095	g	pCi/g		1F	43	0	1.6143		104	
1	0812177-9	SMP	1.0063	1.0063	g	pCi/g		7A	44	0	1.0369		80	
1	0812177-11	SMP	1.0152	1.0152	g	pCi/g	15:16	20	12	14	1.0066		150	
1	0812177-12	SMP	1.0055	1.0055	g	pCi/g		6C	27	8	1.9009		154	
1	0812177-13	SMP	1.0023	1.0023	g	pCi/g		5D	28	6	1.528		60	
1	0812177-14	SMP	1.0013	1.0013	g	pCi/g		1F	45	0	1.4937		32	
1	0812177-15	SMP	1.0106	1.0106	g	pCi/g	15:34	20	14	17	1.6973		83	
1	0812177-17	SMP	1.0094	1.0094	g	pCi/g		6C	30	3	1.5056		129	
1	0812177-18	SMP	1.0129	1.0129	g	pCi/g		5D	31	8	1.3444		69	
1	0812177-19	SMP	1.0126	1.0126	g	pCi/g	15:40	20	1	14	1.2142		79	
1	RE090203-4	MB	1.00841	1.0084	g	pCi/g		6C	20	28	1.3454		22	
1	RE090203-4	LCS	1.00841	1.0084	g	pCi/g	16:06	20	2	13	1.8997		2540	

Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: RE090203-4

Prep Procedure: Ra226_RnE

Analytical QASS / NCR? Y / *N/A*

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Cnt Date Time	Detector ID	Flask ID	Total Bkg Counts	Efficiency	Count Duration	Gross Counts	Notes
----------	-------	---------	----------	---------	-------	--------------	---------------	-------------	----------	------------------	------------	----------------	--------------	-------

Spike Solution Information									
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID	
S1	Ra-226	818.3020.76	99.763	DPM/ml	02/03/09	1	ml	RS-005	
S1	Rn-222	818.3020.76	99.763	DPM/ml	02/03/09	1	ml	RS-005	

Radiochemistry Instrument Worksheet



ALS Paragon

Prep Batch: RE090203-4

Reporting Units

LabID:	TstGrpName:	RptUnits:
0812177-1	Ra226_903.1	pCi/g
0812177-4	Ra226_903.1	pCi/g
0812177-8	Ra226_903.1	pCi/g
0812177-9	Ra226_903.1	pCi/g
0812176-10	Ra226_903.1	pCi/g
0812176-11	Ra226_903.1	pCi/g
0812177-11	Ra226_903.1	pCi/g
0812177-12	Ra226_903.1	pCi/g
0812177-13	Ra226_903.1	pCi/g
0812176-13	Ra226_903.1	pCi/g
0812177-14	Ra226_903.1	pCi/g
0812176-14	Ra226_903.1	pCi/g
0812177-15	Ra226_903.1	pCi/g
0812176-15	Ra226_903.1	pCi/g
0812176-16	Ra226_903.1	pCi/g
0812177-17	Ra226_903.1	pCi/g
0812176-17	Ra226_903.1	pCi/g
0812177-18	Ra226_903.1	pCi/g
0812176-18	Ra226_903.1	pCi/g
0812177-19	Ra226_903.1	pCi/g

Sample Barcodes

0812176-10 RE090203-4PS1		0812176-10DUP RE090203-4PS2	
0812176-10MS RE090203-4PS3		0812176-11 RE090203-4PS4	
0812176-13 RE090203-4PS5		0812176-14 RE090203-4PS6	
0812176-15 RE090203-4PS7		0812176-16 RE090203-4PS8	
0812176-17 RE090203-4PS9		0812176-18 RE090203-4PS10	
0812177-1 RE090203-4PS11		0812177-1DUP RE090203-4PS12	
0812177-4 RE090203-4PS13		0812177-8 RE090203-4PS14	












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NA

Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: RE090203-4

0812177-9 RE090203-4PS15		0812177-11 RE090203-4PS16	
0812177-12 RE090203-4PS17		0812177-13 RE090203-4PS18	
0812177-14 RE090203-4PS19		0812177-15 RE090203-4PS20	
0812177-17 RE090203-4PS21		0812177-18 RE090203-4PS22	
0812177-19 RE090203-4PS23		RE090203-4MB RE090203-4PS24	
RE090203-4LCS RE090203-4PS25			

Radiochemistry Prep Worksheet

Prep Batch: RE090203-4

ALS Paragon

Prep Procedure: Ra226_RnE

Reviewed By: DBC Review Date: 2/24/2009

Non-Routine Pre-Treatment? Y (N) Batch: NA

Re-Prep? Y (N) Batch: NA

Prep QASS / NCR? Y (N) NA

Prep SOP: PAI 783 Rev: 8
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Jay Fielding
Prep Date: 2/3/2009
Prep Dept: RS

Balance: 13
Balance:

Sample Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0812176-10	SMP		1.0001	1.0001	Dry Weight	02/13/09 12:51	02/24/09 10:01		
2	1	0812176-10	DUP		1.0089	1.0089	Dry Weight	02/13/09 12:51	02/24/09 10:01		
3	1	0812176-10	MS		1.0107	1.0107	Dry Weight	02/13/09 12:51	02/24/09 10:01	S1	
4	1	0812176-11	SMP		1.007	1.007	Dry Weight	02/13/09 12:51	02/24/09 10:01		
5	1	0812176-13	SMP		1.0065	1.0065	Dry Weight	02/13/09 12:51	02/24/09 10:01		
6	1	0812176-14	SMP		1.0066	1.0066	Dry Weight	02/13/09 12:51	02/24/09 10:23		
7	1	0812176-15	SMP		1.0066	1.0066	Dry Weight	02/13/09 12:51	02/24/09 10:23		
8	1	0812176-16	SMP		1.0077	1.0077	Dry Weight	02/13/09 12:51	02/24/09 10:23		
9	1	0812176-17	SMP		1.0084	1.0084	Dry Weight	02/13/09 13:12	02/24/09 10:23		
10	1	0812176-18	SMP		1.0137	1.0137	Dry Weight	02/13/09 13:12	02/24/09 10:23		
11	1	0812177-1	SMP		1.0054	1.0054	Dry Weight	02/13/09 13:12	02/24/09 10:41		
12	1	0812177-1	DUP		1.0184	1.0184	Dry Weight	02/13/09 13:12	02/24/09 10:41		
13	1	0812177-4	SMP		1.0089	1.0089	Dry Weight	02/13/09 13:12	02/24/09 10:41		
14	1	0812177-8	SMP		1.0095	1.0095	Dry Weight	02/13/09 13:12	02/24/09 10:41		
15	1	0812177-9	SMP		1.0063	1.0063	Dry Weight	02/13/09 13:12	02/24/09 10:41		
16	1	0812177-11	SMP		1.0152	1.0152	Dry Weight	02/13/09 13:12	02/24/09 11:06		
17	1	0812177-12	SMP		1.0055	1.0055	Dry Weight	02/13/09 13:32	02/24/09 11:06		
18	1	0812177-13	SMP		1.0023	1.0023	Dry Weight	02/13/09 13:32	02/24/09 11:06		
19	1	0812177-14	SMP		1.0013	1.0013	Dry Weight	02/13/09 13:32	02/24/09 11:06		
20	1	0812177-15	SMP		1.0106	1.0106	Dry Weight	02/13/09 13:32	02/24/09 11:22		
21	1	0812177-17	SMP		1.0094	1.0094	Dry Weight	02/13/09 13:32	02/24/09 11:22		
22	1	0812177-18	SMP		1.0129	1.0129	Dry Weight	02/13/09 13:32	02/24/09 11:22		
23	1	0812177-19	SMP		1.0126	1.0126	Dry Weight	02/13/09 13:32	02/24/09 11:42		
24	1	RE090203-4	MB		1.008413	1.008413	Dry Weight	02/13/09 13:32	02/24/09 11:42		
25	1	RE090203-4	LCS		1.008413	1.008413	Dry Weight	02/13/09 15:43	02/24/09 12:02	S1	

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: RE090203-4

Prep Procedure: Ra226_RnE

Reviewed By: DBC *MA* Review Date: 2/24/2009

Non-Routine Pre-Treatment? ☒ Y / *MA* Batch: *MA*

Re-Prep? ☒ Y / *MA* Batch: *MA*

Prep QASS / NCR? ☒ Y / *MA*

Prep SOP: PAI 783 Rev: 8

Prep SOP: NONE

Matrix Class: solid

Prep Analyst: Jay Fielding

Prep Date: 2/3/2009

Prep Dept: RS

Balance: 13

Balance:

Sample Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes

Comments

Spiked By: Jay Fielding

Date: 2/6/2009

Witnessed By: Gabriel D. Wagner

Date: 2/6/2009

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Ra-226	818.3020.76	99.763	DPM/ml	02/03/09	RS-005
S1	Rn-222	818.3020.76	99.763	DPM/ml	02/03/09	RS-005

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: RE090203-4

Prep Batch Not Validated!!!

Prep Procedure: Ra226_RnE

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N Batch:

Re-Prep? Y / N Batch:

Prep QASS / NCR? Y / N

Prep SOP: PAI 783 Rev: 8
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Jay Fielding
Prep Date: 2/3/2009
Prep Dept: RS
Balance: 13
Balance:

Sample Prep Num	LabID	QC Type	Dish No.	Init Aliq g	Fin Aliq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	0812176-10	SMP		1.0001	1.0001	Dry Weight	2/26/09 11:51	2/26/09 10:01		
2	0812176-10	DUP		1.0089	1.0089	Dry Weight				
3	0812176-10	MS		1.0107	1.0107	Dry Weight				S1
4	0812176-11	SMP		1.007	1.007	Dry Weight				
5	0812176-13	SMP		1.0065	1.0065	Dry Weight				
6	0812176-14	SMP		1.0066	1.0066	Dry Weight				10:23
7	0812176-15	SMP		1.0056	1.0056	Dry Weight				
8	0812176-16	SMP		1.0077	1.0077	Dry Weight				
9	0812176-17	SMP		1.0084	1.0084	Dry Weight				
10	0812176-18	SMP		1.0137	1.0137	Dry Weight				
11	0812177-1	SMP		1.0054	1.0054	Dry Weight				10:41
12	0812177-1	DUP		1.0184	1.0184	Dry Weight				
13	0812177-4	SMP		1.0089	1.0089	Dry Weight				
14	0812177-8	SMP		1.0095	1.0095	Dry Weight				
15	0812177-9	SMP		1.0063	1.0063	Dry Weight				
16	0812177-11	SMP		1.0152	1.0152	Dry Weight				
17	0812177-12	SMP		1.0055	1.0055	Dry Weight				11:06
18	0812177-13	SMP		1.0023	1.0023	Dry Weight				
19	0812177-14	SMP		1.0013	1.0013	Dry Weight				
20	0812177-15	SMP		1.0106	1.0106	Dry Weight				11:23
21	0812177-17	SMP		1.0094	1.0094	Dry Weight				
22	0812177-18	SMP		1.0129	1.0129	Dry Weight				
23	0812177-19	SMP		1.0126	1.0126	Dry Weight				11:43
24	RE090203-4	MB		1.008413	1.008413	Dry Weight				
25	RE090203-4	LCS		1.008413	1.008413	Dry Weight				S1

Radiochemistry Prep Worksheet

Prep Batch: RE090203-4

ALS Paragon

Prep Batch Not Validated!!!

Prep Procedure: Ra226_RnE

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N Batch: _____

Prep QASS / NCR? Y / N

Prep SOP: PAI 783 Rev: 8

Prep Analyst: Jay Fielding

Balance: 13

Prep Date: 2/3/2009

Balance:

Matrix Class: solid

Prep Dept: RS

Sample Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes

Comments

Spiked By: Jay Fielding Date: 2/6/09

Witnessed By: CWL Date: 02/06/09

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Ra-226	818.3020.76	99.763	DPM/ml	02/03/09	RS-005
S1	Rn-222	818.3020.76	99.763	DPM/ml	02/03/09	RS-005

exp. 4/8/09

Sample Condition Form for ^{226}Ra in Solid Matrices by Method 903.1M

Analyst: <i>DB</i>		Prep Start Date: <i>2/6/09</i>		Transfer Date: <i>2/24/09</i>	
Work Order	Sample ID	Dry/Wet	Texture	Precipitate/Undissolved Solids at transfer? [Light (L)/Moderate (M)/Heavy (H) /N/A]	Remarks
<i>0812176</i>	<i>10</i>	<i>Wet</i>	<i>fine</i>	<i>L</i>	<i>N/A</i>
	<i>10 Dup</i>				
	<i>10 MS</i>				
	<i>11</i>				
	<i>13</i>				
	<i>14</i>				
	<i>15</i>				
	<i>16</i>				
	<i>17</i>				
	<i>18</i>				
<i>0812177</i>	<i>1</i>				
	<i>4</i>				
	<i>8</i>				
	<i>9</i>				
	<i>11</i>				
	<i>12</i>				
	<i>13</i>				
	<i>14</i>				
	<i>15</i>				
	<i>17</i>				
	<i>18</i>				
	<i>19</i>				
<i>✓</i>	<i>10 Dup</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>

DB
2/24/09

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SAMPLE CONDITION FORM (SOLIDS)

ANALYST: *DBL*

ANALYSIS DATE: *2/6/09*

METHOD: *RESM*

WORK ORDER	SAMPLE ID	SAMPLE CONDITION		
		Dry/Wet	TEXTURE	Remarks
<i>0812176</i>	<i>10</i>	<i>Dry</i>	<i>fine</i>	<i>N/A</i>
	<i>11</i>			
	<i>13</i>			
	<i>14</i>			
	<i>15</i>			
	<i>16</i>			
	<i>17</i>			
	<i>18</i>			
<i>0812177</i>	<i>1</i>			
	<i>4</i>			
	<i>8</i>			
	<i>9</i>			
	<i>11</i>			
	<i>12</i>			
	<i>13</i>			
	<i>14</i>			
	<i>15</i>			
	<i>17</i>			
	<i>18</i>			
<i>✓</i>	<i>19</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>

Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: RE090220-1

Prep Procedure: Ra226_RnE

Analytical QASS / NCR? Y / N

NA

Prep Num	LabID	QC Type	Init Aliq	Fin Aliq	Units	Report Units	Cnt Date Time	Detector ID	Flask ID	Total Bkg Counts	Efficiency	Count Duration	Gross Counts	Notes
1	0812177-20	SMP	1.0194	1.0194	g	pCi/g	11/09 16:48	20	10	33	1.902	15	188	
1	0812178-2	SMP	1.0365	1.0365	g	pCi/g	17:04 20	20	12	11	2.329	1	99	
1	0812178-3	SMP	1.0246	1.0246	g	pCi/g	17:19 20	20	14	18	1.933	1	79	
1	0812178-4	SMP	1.074	1.074	g	pCi/g	17:09 12:48	20	1	11	1.983	1	82	
1	0812178-4	DUP	1.044	1.044	g	pCi/g	1	6C	20	11	1.785	1	85	
1	0812178-5	SMP	1.0955	1.0955	g	pCi/g	13:01 1F	40	18	17	1.744	1	39	
1	0812178-6	SMP	1.0794	1.0794	g	pCi/g	13:01 1F	40	4	4	0.8159	1	37	
1	0812178-7	SMP	1.0372	1.0372	g	pCi/g	13:01 1F	40	9	9	1.0089	1	27	
1	0812178-8	SMP	1.0766	1.0766	g	pCi/g	13:01 20	20	25	25	2.3988	1	167	
1	0812178-10	SMP	1.0105	1.0105	g	pCi/g	13:01 1F	40	17	17	1.716	1	105	
1	0812178-12	SMP	1.0421	1.0421	g	pCi/g	13:01 1F	40	10	10	2.228	1	84	
1	0812178-14	SMP	1.0205	1.0205	g	pCi/g	13:27 1F	43	3	3	1.1973	1	93	
1	0812178-17	SMP	1.0646	1.0646	g	pCi/g	13:27 1F	44	3	3	1.0644	1	16	
1	0812178-17	MS	1.0675	1.0675	g	pCi/g	13:27 1F	44	10	10	1.74	1	134	
1	0812207-2	SMP	1.0205	1.0205	g	pCi/g	13:34 6C	24	4	4	1.112	1	88	
1	0812207-3	SMP	1.0609	1.0609	g	pCi/g	13:34 6C	24	25	21	2.3432	1	87	
1	0812207-4	SMP	1.0076	1.0076	g	pCi/g	13:48 1F	45	10	10	1.4770	1	163	
1	0812207-4	DUP	1.0249	1.0249	g	pCi/g	13:48 1F	46	3	3	1.2831	1	112	
1	0902105-1	SMP	1.0278	1.0278	g	pCi/g	13:48 1F	46	7	8	1.7899	1	96	
1	0902105-2	SMP	1.0065	1.0065	g	pCi/g	14:08 20	20	8	10	1.837	1	26	
1	0902105-3	SMP	1.0267	1.0267	g	pCi/g	14:08 20	20	26	37	1.889	1	36	
1	RE090220-1	MB	1.0413	1.0413	g	pCi/g	14:08 20	20	27	7	1.297	1	12	
1	RE090220-1	LCS	1.0413	1.0413	g	pCi/g	14:08 1F	47	5	5	1.1633	1	194	

Spike Solution Information					
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date
S1	Ra-226	818.3610.23	100.112	DPM/ml	02/20/09
S1	Rn-222	818.3610.23	100.112	DPM/ml	02/20/09

Radiochemistry Instrument Worksheet

Prep Batch: RE090220-1

ALS Paragon

Reporting Units

LabID:	TstGrpName:	RptUnits:
0902105-1	Ra226em_Cabrera_DER	pCi/g
0902105-2	Ra226em_Cabrera_DER	pCi/g
0812207-2	Ra226_903.1	pCi/g
0812178-2	Ra226_903.1	pCi/g
0812207-3	Ra226_903.1	pCi/g
0812178-3	Ra226_903.1	pCi/g
0902105-3	Ra226em_Cabrera_DER	pCi/g
0812178-4	Ra226_903.1	pCi/g
0812207-4	Ra226_903.1	pCi/g
0812178-5	Ra226_903.1	pCi/g
0812178-6	Ra226_903.1	pCi/g
0812178-7	Ra226_903.1	pCi/g
0812178-8	Ra226_903.1	pCi/g
0812178-10	Ra226_903.1	pCi/g
0812178-12	Ra226_903.1	pCi/g
0812178-14	Ra226_903.1	pCi/g
0812178-17	Ra226_903.1	pCi/g
0812177-20	Ra226_903.1	pCi/g








Sample Barcodes

0812177-20 RE090220-1PS1		0812178-2 RE090220-1PS2	
0812178-3 RE090220-1PS3		0812178-4 RE090220-1PS4	
0812178-4DUP RE090220-1PS5		0812178-5 RE090220-1PS6	
0812178-6 RE090220-1PS7		0812178-7 RE090220-1PS8	
0812178-8 RE090220-1PS9		0812178-10 RE090220-1PS10	
0812178-12 RE090220-1PS11		0812178-14 RE090220-1PS12	
0812178-17 RE090220-1PS13		0812178-17MS RE090220-1PS14	
0812207-2 RE090220-1PS15		0812207-3 RE090220-1PS16	

Radiochemistry Instrument Worksheet

Prep Batch: RE090220-1

ALS Paragon

0812207-4 RE090220-1PS17		0812207-4DUP RE090220-1PS18	
0902105-1 RE090220-1PS19		0902105-2 RE090220-1PS20	
0902105-3 RE090220-1PS21		RE090220-1MB RE090220-1PS22	
RE090220-1LCS RE090220-1PS23			

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: RE090220-1

Prep Procedure: Ra226_RnE

Reviewed By: DBC *MC*

Review Date: 3/12/2009

Non-Routine Pre-Treatment? Y / *N* Batch: *NA*

Re-Prep? Y / *N* Batch: *NA*

Prep QASS / NCR? Y / *N*

Prep SOP: PAI 783 Rev: 8

Prep Analyst: Derek B. Caduff

Balance: 13

Prep SOP: NONE

Prep Date: 2/20/2009

Balance:

Matrix Class: solid

Prep Dept: RS

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0812177-20	SMP		1.0194	1.0194	Dry Weight	03/02/09 12:40	03/11/09 11:31		
2	1	0812178-2	SMP		1.0365	1.0365	Dry Weight	03/02/09 12:40	03/11/09 11:47		
3	1	0812178-3	SMP		1.0246	1.0246	Dry Weight	03/02/09 12:40	03/11/09 11:59		
4	1	0812178-4	SMP		1.074	1.074	Dry Weight	03/02/09 12:40	03/12/09 08:48		
5	1	0812178-4	DUP		1.044	1.044	Dry Weight	03/02/09 12:40	03/12/09 08:48		
6	1	0812178-5	SMP		1.0955	1.0955	Dry Weight	03/02/09 12:40	03/12/09 08:48		
7	1	0812178-6	SMP		1.0794	1.0794	Dry Weight	03/02/09 12:40	03/12/09 08:59		
8	1	0812178-7	SMP		1.0372	1.0372	Dry Weight	03/02/09 12:40	03/12/09 08:59		
9	1	0812178-8	SMP		1.0766	1.0766	Dry Weight	03/02/09 12:58	03/12/09 09:10		
10	1	0812178-10	SMP		1.0105	1.0105	Dry Weight	03/02/09 12:58	03/12/09 09:10		
11	1	0812178-12	SMP		1.0421	1.0421	Dry Weight	03/02/09 12:58	03/12/09 09:10		
12	1	0812178-14	SMP		1.0205	1.0205	Dry Weight	03/02/09 12:58	03/12/09 09:27		
13	1	0812178-17	SMP		1.0646	1.0646	Dry Weight	03/02/09 12:58	03/12/09 09:27		
14	1	0812178-17	MS		1.0675	1.0675	Dry Weight	03/02/09 12:58	03/12/09 09:27	S1	
15	1	0812207-2	SMP		1.0205	1.0205	Dry Weight	03/02/09 12:58	03/12/09 09:34		
16	1	0812207-3	SMP		1.0609	1.0609	Dry Weight	03/02/09 12:58	03/12/09 09:34		
17	1	0812207-4	SMP		1.0076	1.0076	Dry Weight	03/02/09 13:43	03/12/09 09:48		
18	1	0812207-4	DUP		1.0249	1.0249	Dry Weight	03/02/09 13:43	03/12/09 09:48		
19	1	0902105-1	SMP		1.0278	1.0278	Dry Weight	03/02/09 13:43	03/12/09 09:48		
20	1	0902105-2	SMP		1.0065	1.0065	Dry Weight	03/02/09 13:43	03/12/09 10:01		
21	1	0902105-3	SMP		1.0267	1.0267	Dry Weight	03/02/09 13:43	03/12/09 10:01		
22	1	RE090220-1	MB		1.0413	1.0413	Dry Weight	03/02/09 13:43	03/12/09 10:01		
23	1	RE090220-1	LCS		1.0413	1.0413	Dry Weight	03/02/09 13:43	03/12/09 10:19	S1	

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: RE090220-1

Prep Procedure: Ra226_RnE

Reviewed By: DBC *MC* Review Date: 3/12/2009

Non-Routine Pre-Treatment? *Y* *N* Batch: *NA* Re-Prep? *Y* *N* Batch: *NA* Prep QASS / NCR? *Y* *N* *NA*

Prep SOP: PAI 783 Rev: 8

Prep SOP: NONE

Matrix Class: solid

Prep Analyst: Derek B. Caduff

Prep Date: 2/20/2009

Prep Dept: RS

Balance: 13

Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes

Comments

Spiked By: Derek B. Caduff Date: 2/27/2009

Witnessed By: Gabriel D. Wagner Date: 2/27/2009

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Ra-226	818.3610.23	100.112	DPM/ml	02/20/09	1 ml RS-005
S1	Rn-222	818.3610.23	100.112	DPM/ml	02/20/09	1 ml RS-005

Radiochemistry Prep Worksheet

Prep Batch: RE090220-1

ALS Paragon

Prep Batch Not Validated!!!

Prep Procedure: Ra226_RnE

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N

Batch:

Re-Prep? Y / N

Prep QASS / NCR? Y / N

Prep SOP: PAI 783 Rev: 8

Prep Analyst: Derek B. Caduff

Balance: 13

Prep SOP: NONE

Prep Date: 2/20/2009

Balance:

Matrix Class: solid

Prep Dept: RS

Sample Num	Prep Num	LabID	QC Type	Dish No.	Init Aliq g	Fin Aliq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0812177-20	SMP		1.0194	1	Dry Weight	7/10/09	12:40 3/11/09	11:31	
2	1	0812178-2	SMP		1.0365	1	Dry Weight		11:45		
3	1	0812178-3	SMP		1.0246	1	Dry Weight		11:59		
4	1	0812178-4	SMP		1.074	1	Dry Weight		7/10/09	8:48	
5	1	0812178-4	DUP		1.044	1	Dry Weight				
6	1	0812178-5	SMP		1.0955	1	Dry Weight				
7	1	0812178-6	SMP		1.0794	1	Dry Weight		8:39		
8	1	0812178-7	SMP		1.0372	1	Dry Weight				
9	1	0812178-8	SMP		1.0766	1	Dry Weight		11:58	9:10	
10	1	0812178-10	SMP		1.0105	1	Dry Weight				
11	1	0812178-12	SMP		1.0421	1	Dry Weight			9:27	
12	1	0812178-14	SMP		1.0205	1	Dry Weight				
13	1	0812178-17	SMP		1.0646	1	Dry Weight				
14	1	0812178-17	MS		1.0675	1	Dry Weight			S1	
15	1	0812207-2	SMP		1.0205	1	Dry Weight		9:34		
16	1	0812207-3	SMP		1.0609	1	Dry Weight				
17	1	0812207-4	SMP		1.0076	1	Dry Weight	13:43	9:48		
18	1	0812207-4	DUP		1.0249	1	Dry Weight				
19	1	0902105-1	SMP		1.0278	1	Dry Weight				
20	1	0902105-2	SMP		1.0065	1	Dry Weight		10:01		
21	1	0902105-3	SMP		1.0267	1	Dry Weight				
22	1	RE090220-1	MB		1.0413	1.0413	Dry Weight				
23	1	RE090220-1	LCS		1.0413	1.0413	Dry Weight		16:17	S1	

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: RE090220-1

Prep Batch Not Validated!!!

Prep Procedure: Ra226_RnE

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N Batch: _____

Prep QASS / NCR? Y / N _____

Prep SOP: PAI 783 Rev: 8

Prep Analyst: Derek B. Caduff *MC*

Balance: 13

Prep Date: 2/20/2009

Balance:

Matrix Class: solid

Prep Dept: RS

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes

Comments

Spiked By: Derek B. Caduff *DBL* Date: *2/27/09*
 Witnessed By: *60W* Date: *2-27-09*

Spike Solution Information									
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID	
S1	Ra-226	818.3610.23	100.112	DPM/ml	02/20/09	1	ml	RS-005	
S1	Rn-222	818.3610.23	100.112	DPM/ml	02/20/09	1	ml	RS-005	

exp. 2/4/10

Radiochemistry Prep Worksheet

Prep Batch: DG090105-3

ALS Paragon

Prep Procedure: Dry_Grind

Reviewed By: *sdw* Review Date: 1/6/2009

Non-Routine Pre-Treatment? *Y* Batch: *N/A* Re-Prep? *Y* Batch: *N/A* Prep QASS / NCR? *Y* Batch: *N/A*

Prep SOP: SOP336 Rev: 0
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Steven D. White
Prep Date: 1/5/2009
Prep Dept: GP
Balance: 15
Oven In Date: 12/19/2008 3:55:00 PM
Oven Out Date: 12/24/2008 1:00:00 PM

Sampl Num	Prep Num	LabID	QC Type	Dish No.	Tare g	Gross g	Net g	Prep Notes
1	1	0812177-1	SMP		98.8	133.3	34.5	
2	1	0812177-2	SMP		98.8	152.1	53.3	
3	1	0812177-3	SMP		99.1	126.1	27	
4	1	0812177-4	SMP		99.1	132.7	33.6	
5	1	0812177-5	SMP		98.5	220.6	122.1	
6	1	0812177-6	SMP		99.1	220.1	121	
7	1	0812177-7	SMP		98.6	121.5	22.9	
8	1	0812177-8	SMP		98.2	154.5	56.3	
9	1	0812177-9	SMP		99.5	141.4	41.9	
10	1	0812177-10	SMP		98.8	165	66.2	
11	1	0812177-11	SMP		98.3	110.8	12.5	
12	1	0812177-12	SMP		98.7	118.8	20.1	
13	1	0812177-13	SMP		98.4	181.9	83.5	
14	1	0812177-14	SMP		99.1	111.1	12	
15	1	0812177-15	SMP		98.4	110.5	12.1	
16	1	0812177-16	SMP		98.9	115	16.1	
17	1	0812177-17	SMP		98.5	146.2	47.7	
18	1	0812177-18	SMP		98.2	147.5	49.3	
19	1	0812177-19	SMP		99.3	134.8	35.5	
20	1	0812177-20	SMP		98.3	134.2	35.9	

Comments

Spiked By: *N/A* Date: *N/A*
Witnessed By: *N/A* Date: *N/A*

Sample Condition Form for ^{226}Ra in Solid Matrices by Method 903.1M

Analyst: <i>MC</i>					
Prep Start Date: <i>2/7/09</i>				Transfer Date: <i>3/11/09 - 3/12/09</i>	
Work Order	Sample ID	Dry/Wet	Texture	Precipitate/Undissolved Solids at transfer? [Light (L)/Moderate (M)/Heavy (H)/N/A]	Remarks
<i>08/21/77</i>	<i>20</i>	<i>Wet</i>	<i>fine</i>	<i>L</i>	<i>N/A</i>
<i>08/21/78</i>	<i>2</i>	|	|	|	|
	<i>3</i>	|	|	|	|
	<i>4</i>	|	|	|	|
	<i>4 Dup</i>	|	|	|	|
	<i>5</i>	|	|	|	|
	<i>6</i>	|	|	|	|
	<i>7</i>	|	|	|	|
	<i>8</i>	|	|	|	|
	<i>10</i>	|	|	|	|
	<i>12</i>	|	|	|	|
	<i>14</i>	|	|	|	|
	<i>17</i>	|	|	|	|
<i>✓</i>	<i>17/15</i>	|	|	|	|
<i>08/22/07</i>	<i>2</i>	|	|	|	|
	<i>3</i>	|	|	|	|
	<i>4</i>	|	|	|	|
<i>✓</i>	<i>4 Dup</i>	|	|	<i>✓</i>	|
<i>09/01/05</i>	<i>1</i>	|	|	<i>✓</i>	|
	<i>2</i>	|	|	|	|
<i>✓</i>	<i>3</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>	<i>✓</i>
<i>MC</i> <i>3/12/09</i>					

SAMPLE CONDITION FORM (SOLIDS)

ANALYST: *DBC*

ANALYSIS DATE: *2/27/09*

METHOD: *RES*

WORK ORDER	SAMPLE ID	SAMPLE CONDITION		
		Dry/Wet	TEXTURE	Remarks
<i>08/21/77</i>	<i>20</i>	<i>Dry</i>	<i>fine</i>	<i>N/A</i>
<i>08/21/78</i>	<i>2</i>			
	<i>3</i>			
	<i>4</i>			
	<i>5</i>			
	<i>6</i>			
	<i>7</i>			
	<i>8</i>			
	<i>10</i>			
	<i>12</i>			
	<i>14</i>			
<i>↓</i>	<i>17</i>			
<i>08/22/07</i>	<i>2</i>			
<i>↓</i>	<i>3</i>			
<i>↓</i>	<i>4</i>			
<i>09/01/05</i>	<i>1</i>			
<i>↓</i>	<i>2</i>			
<i>↓</i>	<i>3</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>
<i>DBC</i>				
<i>2/27/09</i>				



Section 8

STANDARDS TRACEABILITY DOCUMENTS



Prepare a working dilution of Ra-226 at ~100 dpm/mL
from 818,3610.31

1) Density of 1M HCl Lot# 083159 Bal. FD
Mass of 100ml Volumetric Flask! 66.4339g 12
Mass of Flask & 100ml acid! 167.838g ↓
Net mass of acid! 101.42g
 $\rho = 1.0142 \text{ g/mL}$

2) Mass of # 818,3610.31 Transferred
Mass of empty bottle w/out lid! 74.5824g 12
Mass of bottle & Standard! 80.0210g ↓
Net mass of Standard! 5.4386g

3) Dilute with acid
Mass of empty bottle w/out lid! 74.5824g 12
Mass of bottle, standard, & diluent! 108.8g 26
Net mass of standard & diluent! 101.422g

4) Final Activity

$$\frac{(181.451.8 \text{ dpm} \times 5.4386 \text{ g}) \times (1.0142 \text{ g/mL})}{(101.422 \text{ g})} = 100.35 \text{ dpm/mL}$$

RG 2/24/09

Std ID: 818.3610.23

Description: Ra-226

Expiration: 2/4/2010

Activity: 100.35 dpm/mL

2s Uncertainty: 1.20 dpm/mL

Ref. Date: 9/1/2003

Ref Time: N/A

Prep Date: 1/2/2009 Prep by: DBC

Matrix/Comp. 1M HCl

Half Life (y): 1.60E+03

RG 2/24/09

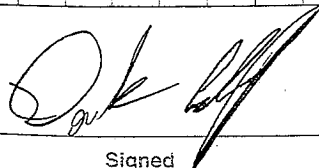
Reverification Log

Analysis Date	Initials	Expiration Date

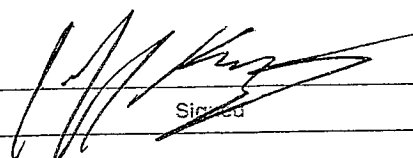
RG 2/24/09

Continued on Page

Read and Understood By

Signed 

1/2/09
Date

Signed 

1/2/09

U.S. Department of Commerce
National Institute of Standards
and Technology
SRM 4967A
Radium-226

<15 kBq in 4% hydrochloric acid

CAUTION
RADIOACTIVE
MATERIAL



Prepare a primary dilution of RSO
#818 (NIST 4967A) by diluting the
entire stock solution to approx 40 ml
w/ 1M HCl

1) Prepared 2L HCl in 1M solution by
diluting 166 ml conc HCl, Fischer
lot # 060506, in 2L DI water.

2) Determine density of 1M HCl

Mass of 100 ml volumetric flask = 56.4422 g (Bal 12)
Mass of flask + acid = 157.6815 g ↓
Net mass of 1M HCl = 101.2393 g
÷ 100 ml = density of 1M HCl = 1.0124 g/ml.

3) Transfer contents of ampoule to 40 ml VOA vial.

Mass of VOA vial = 24.9938 g (Bal 12)
Mass of vial + std = 29.9415 g ↓
Net mass of std transferred = 4.9477 g

4) Dilute w/ 1M HCl

Mass of vial + std + HCl = 64.9255 g Bal 12
Mass of vial (from above) = 24.9938 g
Net mass of primary std. = 39.9317 g

5) Final Activity Calculation

$$\frac{(2482 \text{ Bq/g})(4.9477 \text{ g})(60 \text{ Bq/dpm})}{(39.9317 \text{ g})} = 18,451.8 \text{ dpm/g}$$

Ref date 9/1/03

Continued on Page

Read and Understood By

David C. Burr 5/10/06
Signed Date

Renee M. Kelley 5/18/06
Signed Date 64 of 263



RSO#818 Recd 5/8/06
DB

National Institute of Standards & Technology Certificate

Standard Reference Material 4967A Radium-226 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive radium-226 chloride (and its radioactive decay products), non-radioactive barium chloride and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of instruments and for the monitoring of radiochemical procedures.

Radiological Hazard: The SRM ampoule contains radium-226 with an activity of approximately 13 kBq. Radium-226 decays by alpha-particle emission. The progeny of radium-226 have a total activity of approximately 95 kBq and decay by alpha- and beta-particle emission. None of the alpha or beta particles escape from the SRM ampoule. During the decay process, X-rays and gamma rays with energies from 11 keV to 2.5 MeV are also emitted. Most of these photons escape from the SRM ampoule and can represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. Gaseous radon-222 will escape from the ampoule when it is opened. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard: The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 1.0 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling: The SRM should be stored and used at a temperature between 5 °C and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least September 2013. The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of both the radioactivity and the strong acid.

Preparation: This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, M.P. Unterwiesing, Acting Group Leader. The overall technical direction and physical measurements leading to certification were provided by R. Collé and P. Volkovitsky of the Radioactivity Group. Statistical consultation was provided by S.D. Leigh of the NIST Statistical Engineering Division. The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program.

Lisa R. Karam, Acting Chief
Ionizing Radiation Division

Gaithersburg, Maryland 20899
December 2004

Robert L. Watters, Jr., Chief
Measurement Services Division

Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution usually contains strong acid or base and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle. NEVER PIPETTE BY MOUTH.
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]*.

PROPERTIES OF SRM 4967A

Certified values

Radionuclide	Radium-226
Reference time	1200 EST, 01 September 2003
Massic activity of the solution [b]*	2482 Bq·g ⁻¹
Relative expanded uncertainty (<i>k</i> =2)	1.20% [c] [d]
Solution mass	(5.086 ± 0.003) g [e]
Solution density	(1.017 ± 0.002) g·mL ⁻¹ at 21 °C [e]

Uncertified values

Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L ⁻¹)	Mass Fraction (g·g ⁻¹)
	H ₂ O	54	0.96
	HCl	1.0	0.04
	BaCl ₂	4 × 10 ⁻⁴	8 × 10 ⁻⁵
	²²⁶ RaCl ₂	3 × 10 ⁻⁷	9 × 10 ⁻⁸
Radiological Properties:			
Photon-emitting impurities	None detected [f]		
Half lives used	Radium-226: (1600 ± 7) a [g] [5] Radon-222: (3.8235 ± 0.0003) d [g] [5]		
Calibration method and measuring instrument(s)	Gravimetric dilution of SRM 4963, confirmed by comparison with solution standards, and derivatives thereof, from the NBS/NIST "1947 (1967 recalibrated) series" of radium-226 solution standards. The mass of radium-226 in these solution standards had previously been determined by comparison with the U.S. National Standards for radium-226. Conversion from mass of radium-226 to activity of radium-226 was done using the half life of radium-226 shown above. [h]		

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ACTIVITY [c] [d]*

Input Quantity x_i , the source of uncertainty (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$, the standard uncertainty of x_i (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$, (%) [i]	Relative Sensitivity Factor, $|\partial y/\partial x_i| \cdot$ (x_i/y) [j]	Relative Uncertainty Of Output Quantity, $u(y)/y$, (%) [k]
Calibration of the "1947 (1967 recalibrated) series" of radium-226 solution standards in terms of mass of radium- 226 [h]	Estimated (B)	0.34	1.0	0.34
Ratio of the mass of radium-226 in SRM 4967A to the mass of radium-226 in the "1947 (1967 recalibrated) series" of radium-226 solution standards	Weighted mean of the ratios obtained using seven different comparisons (B)	0.15	1.0	0.15
Corrections for the decay of radium-226	Standard uncertainty of the radium-226 half-life (A) [m]	0.44	0.016 [n]	0.007
Gravimetric measurements	Estimated (B)	0.10	1.0	0.10
Conversion of radium- 226 mass to activity [p]	Standard uncertainty of the radium-226 half-life (A) [q]	0.44	1.0	0.44
Photon-emitting impurities	Limit of detection (B) [r]	100.	0.0001	0.01
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$, (%)				0.6
Coverage Factor, k				<u>x 2</u>
Relative Expanded Uncertainty of the Output Quantity, U/y , (%)				1.2

NOTES

- [a] The Sievert is the SI unit for dose equivalent. See reference [1]. One μSv is equal to 0.1 mrem.
 Distance from Ampoule (cm): 1 10 100
 Approximate Dose Rate ($\mu\text{Sv/h}$): 5 0.4
- [b] **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [c] The reported value, y , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \dots, x_n)$, where f is a mathematical function derived from the assumed model of the measurement process. The value, x_i , used for each input quantity i has a **standard uncertainty**, $u(x_i)$, that generates a corresponding uncertainty in y , $u_i(y) = |\partial y / \partial x_i| \cdot u(x_i)$, called a **component of combined standard uncertainty** of y . The **combined standard uncertainty** of y , $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty. The combined standard uncertainty is multiplied by a **coverage factor** of $k=2$ to obtain U , the **expanded uncertainty** of y .
- Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ with a level of confidence of approximately 95 percent.
- For further information on the expression of uncertainties, see references [2] and [3].
- [d] The value of each component of combined standard uncertainty, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic response is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval $U/2$ to $2U$ (i.e., within a factor of 2 of the estimated value).
- [e] The stated uncertainty is two times the standard uncertainty.
- [f] Estimated limits of detection for photon-emitting impurities, as of the reference time, expressed as massic photon emission rates, are:
 $6 \times 10^0 \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 22 and 182 keV,
 $3 \times 10^0 \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 190 and 347 keV,
 $8 \times 10^{-1} \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 356 and 1455 keV, and
 $3 \times 10^{-1} \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 1465 and 2750 keV,
 provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of radium-226 and progeny.
- [g] The stated uncertainty is the standard uncertainty.

- [h] For further details on NBS/NIST radium series calibrations refer to reference [6]. The 1967 recalibrations of the "1947 series" and of the "1957 series" were made using pressurized "4 π " γ ionization chamber (PIC) "A".

The master solution for SRM 4967A was directly compared with the "1947 (1967 recalibrated) series" of radium-226 solution standards using PIC "A", and was compared with solutions of the "1992 series" of radium solution standards (SRM 4967) using PIC "A", pulse-ionization-chamber radon analyses (see references [7] and [8]), and germanium photon spectrometry.

The radium-226 in SRM 4967A was chemically purified approximately 55 years ago. The lead-210 and its daughter radionuclides are not in equilibrium.

- [i] Relative standard uncertainty of the input quantity x_i .
- [j] The relative change in the output quantity y divided by the relative change in the input quantity x_i . If $|\partial y / \partial x_i| \cdot (x_i / y) = 1.0$, then a 1% change in x_i results in a 1% change in y . If $|\partial y / \partial x_i| \cdot (x_i / y) = 0.05$, then a 1% change in x_i results in a 0.05% change in y .
- [k] Relative component of combined standard uncertainty of output quantity y , rounded to two significant figures or less. The relative component of combined standard uncertainty of y is given by $u_i(y)/y \equiv |\partial y / \partial x_i| \cdot u(x_i)/y = |\partial y / \partial x_i| \cdot (x_i / y) \cdot u(x_i)/x_i$. The numerical values of $u(x_i)/x_i$, $|\partial y / \partial x_i| \cdot (x_i / y)$, and $u_i(y)/y$, all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.
- [m] The relative standard uncertainty of $\lambda \cdot t$ is determined by the relative standard uncertainty of λ (i.e., of the half life). The relative standard uncertainty of t is negligible.
- [n] $|\partial y / \partial x_i| \cdot (x_i / y) = |\lambda \cdot t|$
- [p] The U.S. National Standards for radium-226 are certified in terms of mass of radium-226, as were all radium-226 SRMs prior to the "1992 series". Beginning with the "1992 series", radium-226 solution SRMs are now certified in terms of the massic activity of radium-226.
- [q] The relative standard uncertainty of the activity of radium-226 per unit mass of radium-226 is determined by the relative standard uncertainty of λ (i.e., of the half life). The relative standard uncertainties of the atomic weight of radium-226 and of Avogadro's number are negligible.
- [r] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e. $u(x_i)/x_i = 100\%$. $|\partial y / \partial x_i| \cdot (x_i / y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Ra-226})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Ra-226})\}$. Thus $u_i(y)/y$ is the relative change in y if the impurity were present with a massic activity equal to the estimated limit of detection.

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- [1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from Global Engineering Documents, 12 Inverness Way East, Englewood, CO 80112, U.S.A. Telephone 1-800-854-7179.
- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993 (corrected and reprinted, 1995). Available from Global Engineering Documents, 12 Inverness Way East, Englewood, CO 80112, U.S.A. Telephone 1-800-854-7179.
- [3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.
- [4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.
- [5] Evaluated Nuclear Structure Data File (ENSDF), September 2003.
- [6] W.B. Mann, L.L. Stockman, W.J. Youden, A. Schwebel, P.A. Mullen and S.B. Garfinkel, Preparation of New Solution Standards of Radium, *Journal of Research of the National Bureau of Standards* **62** (1959) 21-26.
- [7] R. Collé, J.M.R. Hutchinson and M.P. Unterweger, The NIST Primary Radon-222 Measurement System, *Journal of Research of the National Institute of Standards and Technology* **95** (1990) 155-165.
- [8] J.M.R. Hutchinson, J. Cessna, R. Collé and P. Hodge, An International Radon-In-Air Measurement Intercomparison Using a New Transfer Standard, *Applied Radiation and Isotopes* **43** (1992) 175-189.

Prepare a working dilution of 818.3020.31 to a final concentration of approximately 100 dpm/ml.

1) Determine density of 1M HCl: (Lot # 063537) (Bal 12)
 Mass of empty 100 ml Class A flask: 62.4699 g
 Mass of 100 ml Class A glass + 100 ml 1M HCl: 163.9106 g
 Net mass of 1M HCl: 101.4407
 $\div 100 = \text{density} = 1.0144 \text{ g/ml}$

2) Transfer std to 1 L Nalgene bottle: (Bal 12)
 Mass of bottle (w/o lid): 74.2161 g
 Mass of bottle + std: 79.4285 g
 Net mass of std. transferred: 5.4124 g

3) Dilute w 1M HCl (Bal 26)
 Mass of bottle + std + 1M HCl: 1087.3 g
 Mass of bottle (from above): 74.2161 g
 Net mass of std: 1013.0839 g

4) Final Activity Calculation:

$$\frac{5.4124 \text{ g} \times 18451.8 \text{ dpm/g} \times 1.0144 \text{ g/ml}}{1013.0839 \text{ g}} = 99.998 \text{ dpm/ml}$$

5) Std. transferred to Marinelli beaker for verification by γ -spec

Std ID: 818.3020.76

Description: Ra-226

Expiration: 5/3/2008

Activity: 100.00 dpm/mL

2s Uncertainty: 1.20 dpm/mL

Ref. Date: 9/1/2003

Ref Time: N/A

Prep Date: 4/30/2007 Prep by: KB

Matrix/Comp. 1M HCl

Half Life (y): 1.60E+03

Reverification Log

Analysis Date	Initials	Expiration Date
4/9/08	MC	4/8/09

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Read and Understood By

Kiptal Brown
Signed

4/25/07
Date

Benevalley
Signed

5/15/07

U.S. Department of Commerce
National Institute of Standards
and Technology
SRM 4967A
Radium-226

<15 kBq in 4% hydrochloric acid

CAUTION
RADIOACTIVE
MATERIAL



Prepare a primary dilution of RSO
#818 (NIST 4967A) by diluting the
entire stock solution to approx 40 ml
w/ 1M HCl

1) Prepared 2L HCl in 1M solution by
diluting 166 mL conc HCl, Fischer
Lot # 060506, in 2L DI water.

2) Determine density of 1M HCl

Mass of 100 mL volumetric flask = 56.4422 g (Bal 12)

Mass of flask + acid = 157.6815 g ↓

Net mass of 1M HCl = 101.2393 g

÷ 100 mL = density of 1M HCl = 1.0124 g/mL

3) Transfer contents of ampoule to 40 mL VOA vial.

Mass of VOA vial = 24.9938 g (Bal 12)

Mass of vial + std = 29.9415 g ↓

Net mass of std transferred = 4.9477 g

4) Dilute w/ 1M HCl

Mass of vial + std + HCl = 64.9255 g Bal 12

Mass of vial (from above) = 24.9938 g

Net mass of primary std. = 39.9317 g

5) Final Activity Calculation

$$\frac{(2482 \text{ Bq/g}) (4.9477 \text{ g}) (60 \text{ Bq/dpm})}{(39.9317 \text{ g})} = 18,451.8 \text{ dpm/g}$$

Ref date 9/1/03

Continued on Page _____

Read and Understood By

Don CB

Signed

5/10/06

Date

Renée Hall

Signed

5/18/06

Date



RSO #818 Rec'd 5/8/06
National Institute of Standards & Technology

Certificate

Standard Reference Material 4967A Radium-226 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive radium-226 chloride (and its radioactive decay products), non-radioactive barium chloride and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of instruments and for the monitoring of radiochemical procedures.

Radiological Hazard: The SRM ampoule contains radium-226 with an activity of approximately 13 kBq. Radium-226 decays by alpha-particle emission. The progeny of radium-226 have a total activity of approximately 95 kBq and decay by alpha- and beta-particle emission. None of the alpha or beta particles escape from the SRM ampoule. During the decay process, X-rays and gamma rays with energies from 11 keV to 2.5 MeV are also emitted. Most of these photons escape from the SRM ampoule and can represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. Gaseous radon-222 will escape from the ampoule when it is opened. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard: The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 1.0 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling: The SRM should be stored and used at a temperature between 5 °C and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least September 2013. The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of both the radioactivity and the strong acid.

Preparation: This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, M.P. Unterwieser, Acting Group Leader. The overall technical direction and physical measurements leading to certification were provided by R. Collé and P. Volkovitsky of the Radioactivity Group. Statistical consultation was provided by S.D. Leigh of the NIST Statistical Engineering Division. The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program.

Lisa R. Karam, Acting Chief
Ionizing Radiation Division

Gaithersburg, Maryland 20899
December 2004

Robert L. Watters, Jr., Chief
Measurement Services Division

Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution usually contains strong acid or base and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle. NEVER PIPETTE BY MOUTH.
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]*.

PROPERTIES OF SRM 4967A

Certified values

Radionuclide	Radium-226
Reference time	1200 EST, 01 September 2003
Massic activity of the solution [b]*	2482 Bq·g ⁻¹
Relative expanded uncertainty (k=2)	1.20% [c] [d]
Solution mass	(5.086 ± 0.003) g [e]
Solution density	(1.017 ± 0.002) g·mL ⁻¹ at 21 °C [e]

Uncertified values

Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L ⁻¹)	Mass Fraction (g·g ⁻¹)
	H ₂ O	54	0.96
	HCl	1.0	0.04
	BaCl ₂	4 × 10 ⁻⁴	8 × 10 ⁻⁵
	²²⁶ RaCl ₂	3 × 10 ⁻⁷	9 × 10 ⁻⁸
Radiological Properties:			
Photon-ermitting impurities	None detected [f]		
Half lives used	Radium-226: (1600 ± 7) a [g] [5] Radon-222: (3.8235 ± 0.0003) d [g] [5]		
Calibration method and measuring instrument(s)	Gravimetric dilution of SRM 4963, confirmed by comparison with solution standards, and derivatives thereof, from the NBS/NIST "1947 (1967 recalibrated) series" of radium-226 solution standards. The mass of radium-226 in these solution standards had previously been determined by comparison with the U.S. National Standards for radium-226. Conversion from mass of radium-226 to activity of radium-226 was done using the half life of radium-226 shown above. [h]		

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ACTIVITY [c] [d]*

Input Quantity x_i , the source of uncertainty (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$, the standard uncertainty of x_i (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$, (%) [i]	Relative Sensitivity Factor, $|\partial y/\partial x_i| \cdot$ (x_i/y) [j]	Relative Uncertainty Of Output Quantity, $u_c(y)/y$, (%) [k]
Calibration of the "1947 (1967 recalibrated) series" of radium-226 solution standards in terms of mass of radium- 226 [h]	Estimated (B)	0.34	1.0	0.34
Ratio of the mass of radium-226 in SRM 4967A to the mass of radium-226 in the "1947 (1967 recalibrated) series" of radium-226 solution standards	Weighted mean of the ratios obtained using seven different comparisons (B)	0.15	1.0	0.15
Corrections for the decay of radium-226	Standard uncertainty of the radium-226 half-life (A) [m]	0.44	0.016 [n]	0.007
Gravimetric measurements	Estimated (B)	0.10	1.0	0.10
Conversion of radium- 226 mass to activity [p]	Standard uncertainty of the radium-226 half-life (A) [q]	0.44	1.0	0.44
Photon-emitting impurities	Limit of detection (B) [r]	100.	0.0001	0.01
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$, (%)				0.6
Coverage Factor, k				<u>2</u>
Relative Expanded Uncertainty of the Output Quantity, U/y , (%)				1.2

NOTES

- [a] The Sievert is the SI unit for dose equivalent. See reference [1]. One μSv is equal to 0.1 mrem.
 Distance from Ampoule (cm): 1 10 100
 Approximate Dose Rate ($\mu\text{Sv/h}$): 5 0.4
- [b] **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [c] The reported value, y , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \dots, x_n)$, where f is a mathematical function derived from the assumed model of the measurement process. The value, x_i , used for each input quantity i has a **standard uncertainty**, $u(x_i)$, that generates a corresponding uncertainty in y , $u_i(y) = |\partial y / \partial x_i| \cdot u(x_i)$, called a **component of combined standard uncertainty** of y . The **combined standard uncertainty** of y , $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty. The combined standard uncertainty is multiplied by a **coverage factor** of $k=2$ to obtain U , the **expanded uncertainty** of y .
- Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ with a level of confidence of approximately 95 percent.
- For further information on the expression of uncertainties, see references [2] and [3].
- [d] The value of each component of combined standard uncertainty, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic response is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval $U/2$ to $2U$ (i.e., within a factor of 2 of the estimated value).
- [e] The stated uncertainty is two times the standard uncertainty.
- [f] Estimated limits of detection for photon-emitting impurities, as of the reference time, expressed as massic photon emission rates, are:
 $6 \times 10^0 \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 22 and 182 keV,
 $3 \times 10^0 \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 190 and 347 keV,
 $8 \times 10^{-1} \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 356 and 1455 keV, and
 $3 \times 10^{-1} \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 1465 and 2750 keV,
 provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of radium-226 and progeny.
- [g] The stated uncertainty is the standard uncertainty.

- [h] For further details on NBS/NIST radium series calibrations refer to reference [6]. The 1967 recalibrations of the "1947 series" and of the "1957 series" were made using pressurized "4 π " γ ionization chamber (PIC) "A".

The master solution for SRM 4967A was directly compared with the "1947 (1967 recalibrated) series" of radium-226 solution standards using PIC "A", and was compared with solutions of the "1992 series" of radium solution standards (SRM 4967) using PIC "A", pulse-ionization-chamber radon analyses (see references [7] and [8]), and germanium photon spectrometry.

The radium-226 in SRM 4967A was chemically purified approximately 55 years ago. The lead-210 and its daughter radionuclides are not in equilibrium.

- [f] Relative standard uncertainty of the input quantity x_i .
- [j] The relative change in the output quantity y divided by the relative change in the input quantity x_i . If $|\partial y/\partial x_i| \cdot (x_i/y) = 1.0$, then a 1% change in x_i results in a 1% change in y . If $|\partial y/\partial x_i| \cdot (x_i/y) = 0.05$, then a 1% change in x_i results in a 0.05% change in y .
- k] Relative component of combined standard uncertainty of output quantity y , rounded to two significant figures or less. The relative component of combined standard uncertainty of y is given by $u_i(y)/y = |\partial y/\partial x_i| \cdot u(x_i)/y = |\partial y/\partial x_i| \cdot (x_i/y) \cdot u(x_i)/x_i$. The numerical values of $u(x_i)/x_i$, $|\partial y/\partial x_i| \cdot (x_i/y)$, and $u_i(y)/y$, all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.
- [m] The relative standard uncertainty of $\lambda \cdot t$ is determined by the relative standard uncertainty of λ (i.e., of the half life). The relative standard uncertainty of t is negligible.
- [n] $|\partial y/\partial x_i| \cdot (x_i/y) = |\lambda \cdot t|$
- [p] The U.S. National Standards for radium-226 are certified in terms of mass of radium-226, as were all radium-226 SRMs prior to the "1992 series". Beginning with the "1992 series", radium-226 solution SRMs are now certified in terms of the massic activity of radium-226.
- [q] The relative standard uncertainty of the activity of radium-226 per unit mass of radium-226 is determined by the relative standard uncertainty of λ (i.e., of the half life). The relative standard uncertainties of the atomic weight of radium-226 and of Avogadro's number are negligible.
- [r] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e. $u(x_i)/x_i = 100\%$. $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Ra-226})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Ra-226})\}$. Thus $u_i(y)/y$ is the relative change in y if the impurity were present with a massic activity equal to the estimated limit of detection.

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- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993 (corrected and reprinted, 1995). Available from Global Engineering Documents, 12 Inverness Way East, Englewood, CO 80112, U.S.A. Telephone 1-800-854-7179.
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- [8] J.M.R. Hutchinson, J. Cessna, R. Collé and P. Hodge, An International Radon-In-Air Measurement Intercomparison Using a New Transfer Standard, *Applied Radiation and Isotopes* 43 (1992) 175-189.



Section 9

ADDITIONAL SUPPORTING DOCUMENTATION

^{226}Ra by Rn Emanation
Calibration Package for
Detectors E, B, C, D, F, and
A

1/24
1/22/09  1/21/09

Voltage Plateau Data

125
1/22/09

83 of 263

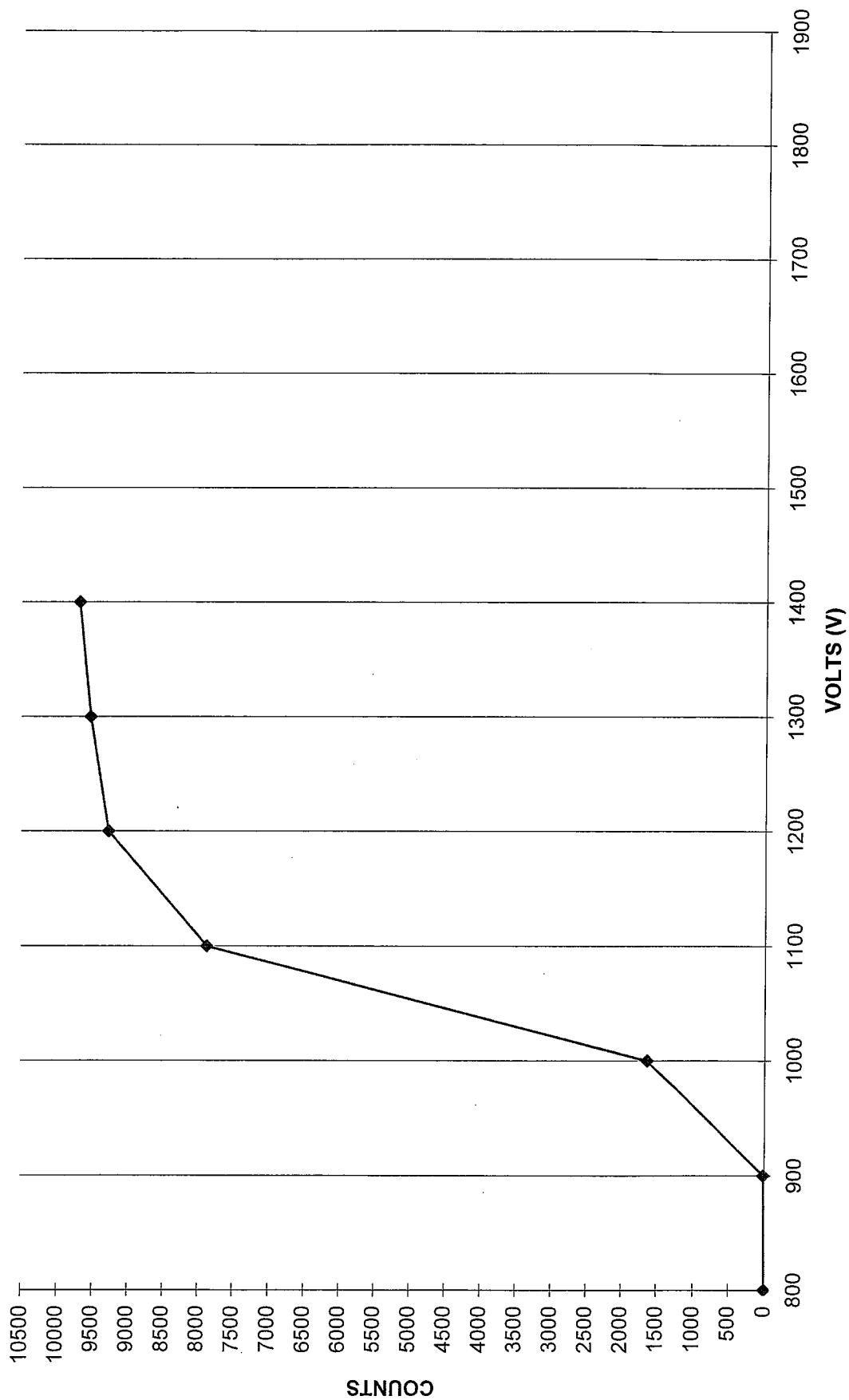
COUNTS

PHOTOMULTIPLIER/SCALAR OPERATING VOLTAGE					
²³⁰ Th SOURCE (18000 dpm) COUNTED FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES					
DATE:	1/14/2008	ANALYST:	LJF		
DETECTOR/SCALAR:	3E				
VOLTS	COUNTS				
600	0				
700	0				
800	0				
900	13				
1000	1632				
1100	7871				
1200	9275				
1300	9529				
1400	9687				
BACKGROUND (NO SOURCE) COUNTED MULTIPLE TIMES FOR 1 MINUTE AT SPECIFIED OPERATING VOLTAGES.					
VOLTS	COUNTS (1)	COUNTS (2)	COUNTS (3)	COUNTS (4)	COUNTS (5)
1200	0	0	0	0	0
1300	3	1	1	1	2
The operating voltage chosen should be the point on the plateau that also gives the lowest possible background counts. Therefore, it is the analyst's opinion that the operating voltage for scalar/detector 3E be set at 1200 V.					
REVIEWED BY: Jay Fielding					

8
1/18/09

PLATEAU

OPERATING VOLTAGE FOR DETECTOR/SCALAR 3E



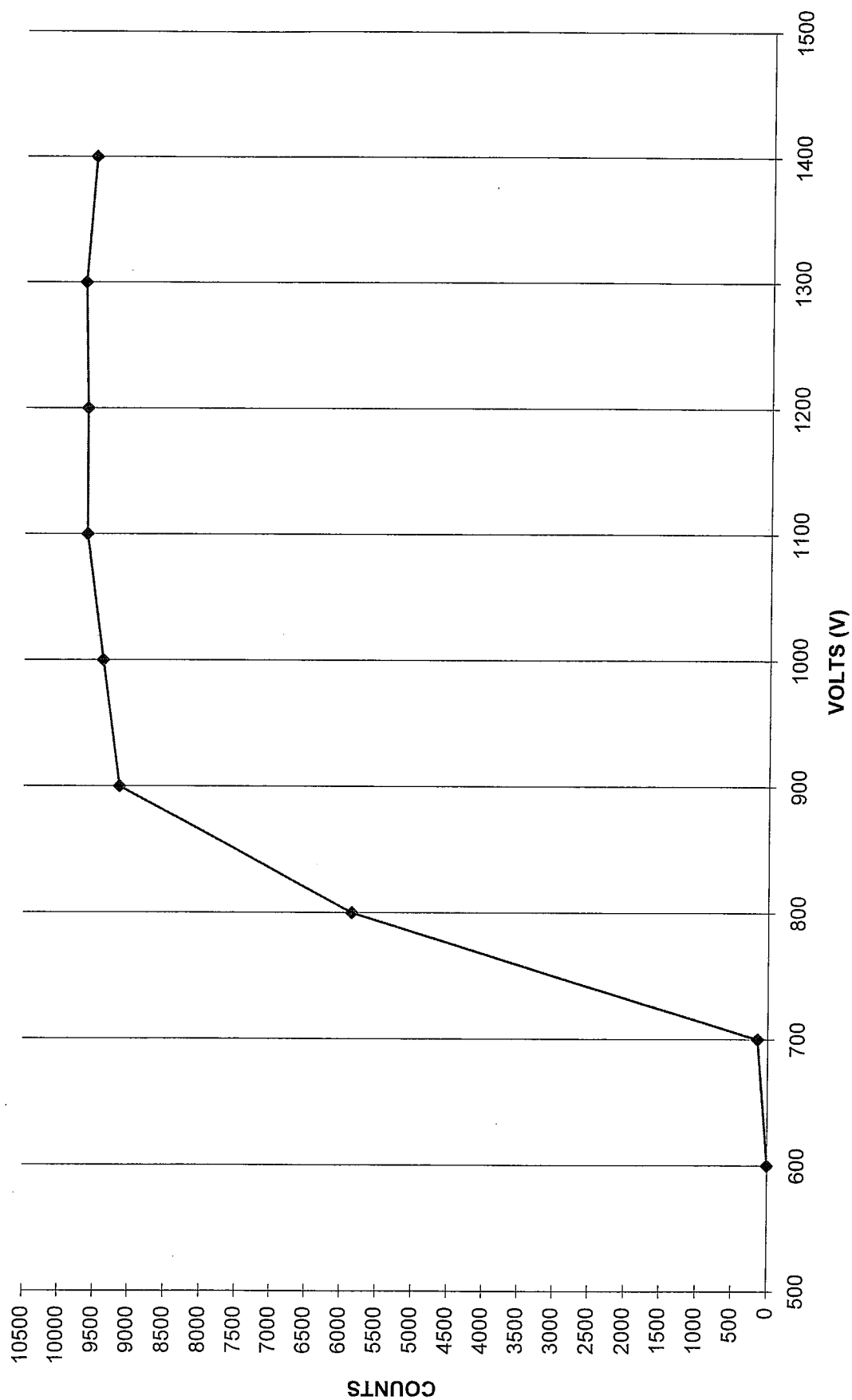
COUNTS

PHOTOMULTIPLIER/SCALAR OPERATING VOLTAGE					
²³⁰ Th SOURCE (18000 dpm) COUNTED FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES					
DATE:	1/14/2009	ANALYST:	LJF		
DETECTOR/SCALAR:	2B				
VOLTS	COUNTS				
600	0				
700	144				
800	5850				
900	9143				
1000	9387				
1100	9620				
1200	9619				
1300	9655				
1400	9515				
BACKGROUND (NO SOURCE) COUNTED MULTIPLE TIMES FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES.					
VOLTS	COUNTS (1)	COUNTS (2)	COUNTS (3)	COUNTS (4)	COUNTS (5)
900	0	0	0	0	0
1000	0	0	0	0	0
1100	0	0	0	0	0
1200	0	0	1	0	0
1300	4	1	3	2	1
The operating voltage chosen should be the point on the plateau that also gives the lowest possible background counts. Therefore, it is the analyst's opinion that the operating voltage for scalar/detector 2B be set at 1100 V.					
REVIEWED BY: Jay Fielding					

8/1/13/09

PLATEAU

OPERATING VOLTAGE FOR DETECTOR/SCALAR 2B



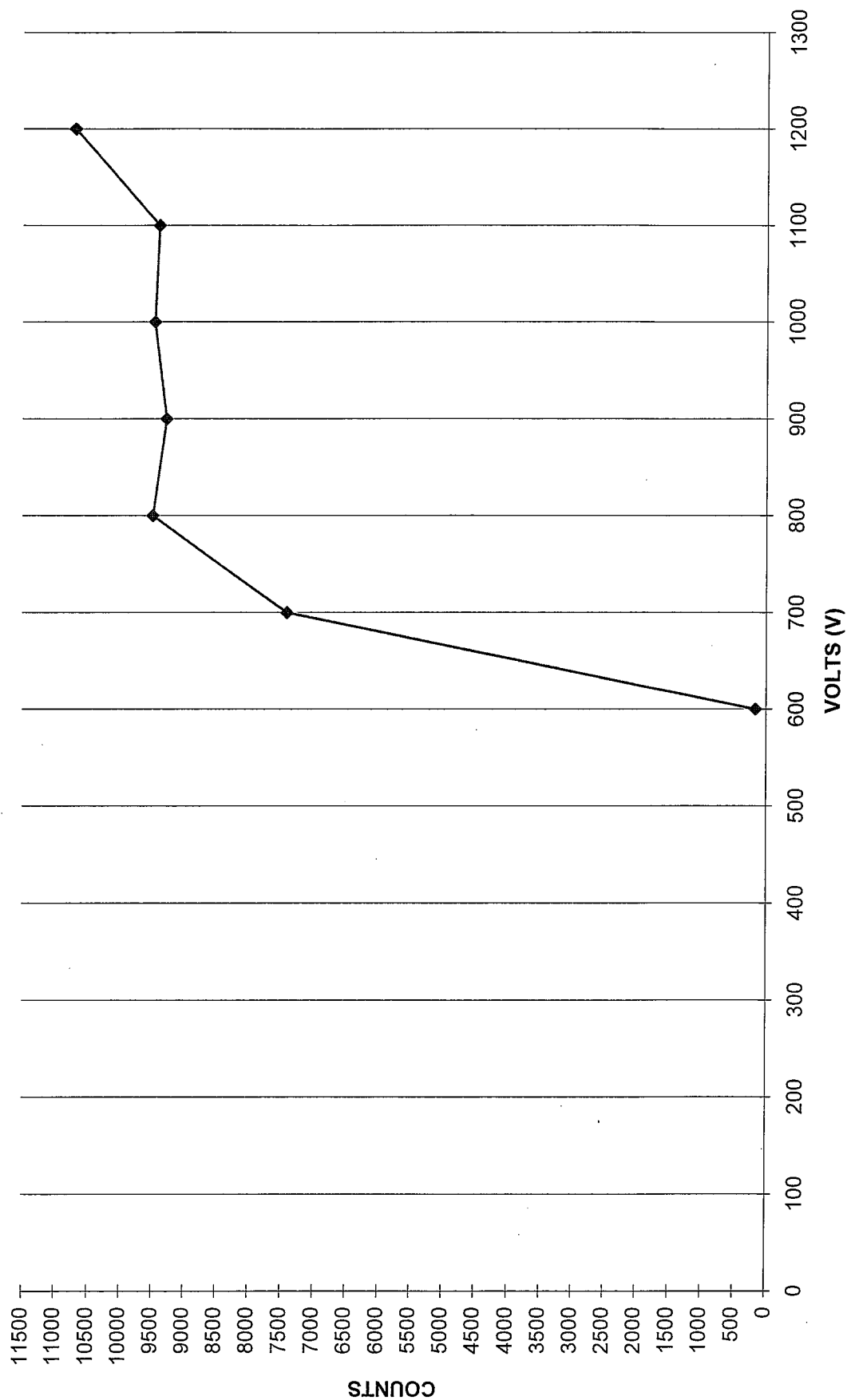
COUNTS

PHOTOMULTIPLIER/SCALAR OPERATING VOLTAGE					
²³⁰ Th SOURCE (18000 dpm) COUNTED FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES					
DATE:	1/14/2009	ANALYST:	LJF		
DETECTOR/SCALAR:	6C				
VOLTS	COUNTS				
600	162				
700	7408				
800	9488				
900	9275				
1000	9460				
1100	9396				
1200	10702				
BACKGROUND (NO SOURCE) COUNTED MULTIPLE TIMES FOR 1 MINUTE AT SPECIFIED OPERATING VOLTAGES					
VOLTS	COUNTS (1)	COUNTS (2)	COUNTS (3)	COUNTS (4)	COUNTS (5)
800	0	0	0	0	0
900	0	0	0	0	0
1000	0	0	0	0	0
1100	3	4	4	6	2
The operating voltage chosen should be the point on the plateau that also gives the lowest possible background counts. Therefore, it is the analyst's opinion that the operating voltage for scalar/detector 6C be set at 900 V.					
REVIEWED BY: Jay Fielding					

8 1/18/09

PLATEAU

OPERATING VOLTAGE FOR DETECTOR/SCALAR



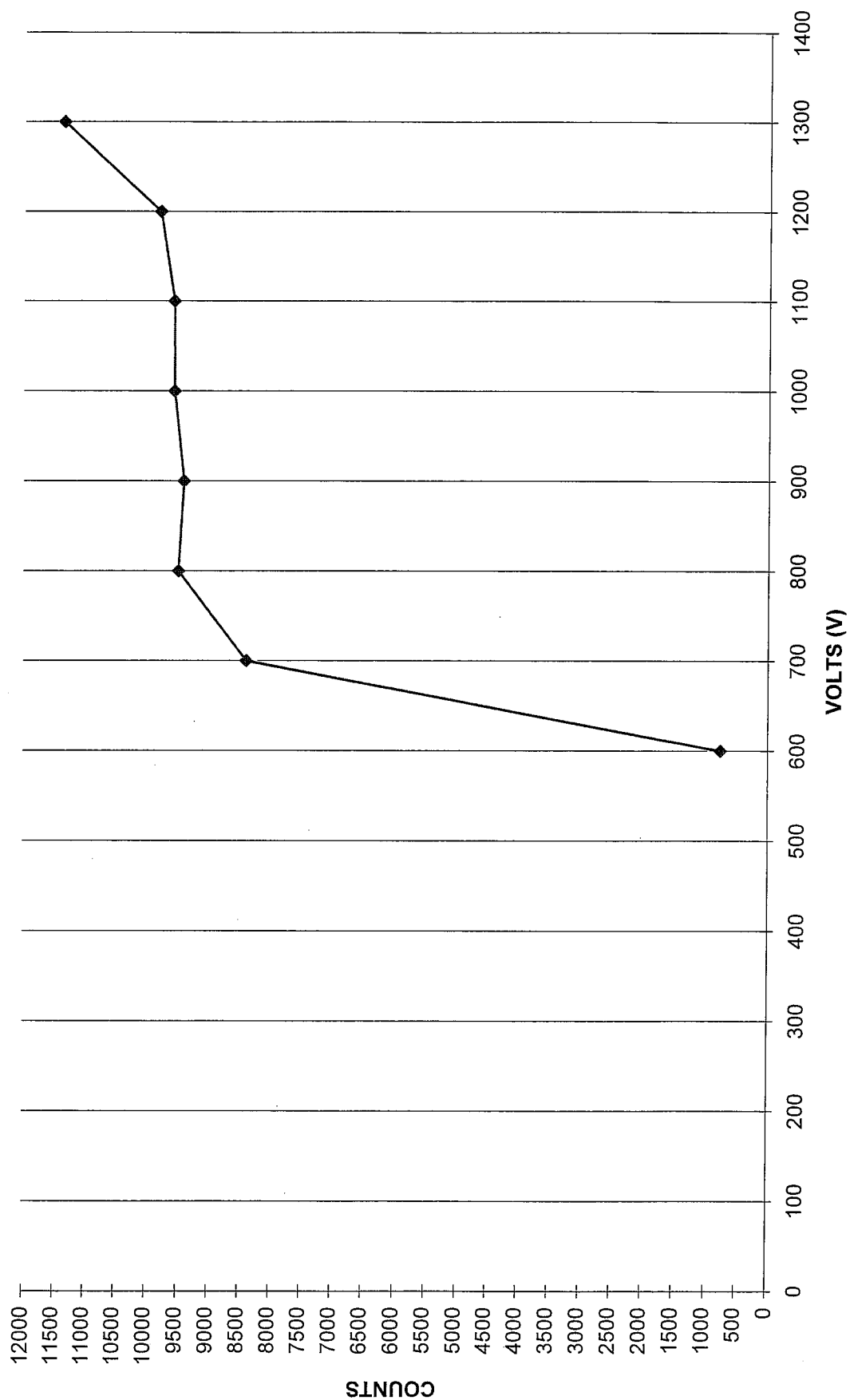
COUNTS

PHOTOMULTIPLIER/SCALAR OPERATING VOLTAGE					
²³⁰ Th SOURCE (18000 dpm) COUNTED FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES					
DATE:	1/14/2009	ANALYST:	LJF		
DETECTOR/SCALAR:	5D				
VOLTS	COUNTS				
600	754				
700	8389				
800	9491				
900	9404				
1000	9562				
1100	9569				
1200	9792				
1300	11354				
BACKGROUND (NO SOURCE) COUNTED MULTIPLE TIMES FOR 1 MINUTE AT SPECIFIED OPERATING VOLTAGES					
VOLTS	COUNTS (1)	COUNTS (2)	COUNTS (3)	COUNTS (4)	COUNTS (5)
800	0	0	0	0	0
900	0	0	0	0	0
1000	2	1	1	3	3
The operating voltage chosen should be the point on the plateau that also gives the lowest possible background counts. Therefore, it is the analyst's opinion that the operating voltage for scalar/detector 5D be set at 900 V.					
REVIEWED BY: Jay Fielding					

8 1/19/09

PLATEAU

OPERATING VOLTAGE FOR DETECTOR/SCALAR



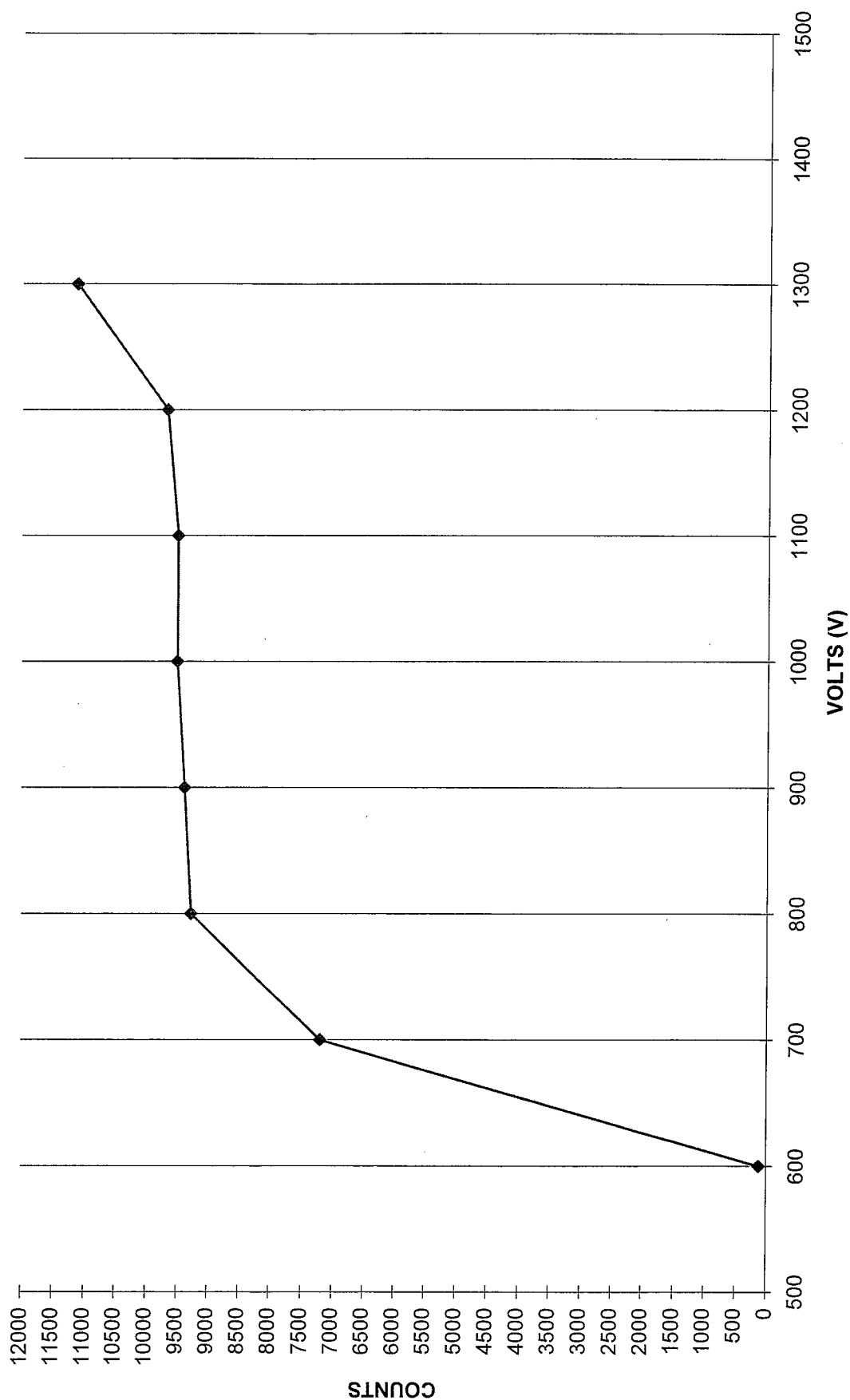
COUNTS

PHOTOMULTIPLIER/SCALAR OPERATING VOLTAGE					
²³⁰ Th SOURCE (18000 dpm) COUNTED FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES					
DATE:	1/14/2009	ANALYST:	LJF		
DETECTOR/SCALAR:	1F				
VOLTS	COUNTS				
600	119				
700	7196				
800	9270				
900	9376				
1000	9505				
1100	9496				
1200	9672				
1300	11128				
BACKGROUND (NO SOURCE) COUNTED MULTIPLE TIMES FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES.					
VOLTS	COUNTS (1)	COUNTS (2)	COUNTS (3)	COUNTS (4)	COUNTS (5)
800	0	0	0	0	0
900	0	0	0	0	0
1000	0	1	1	0	0
1100	3	4	3	2	1
The operating voltage chosen should be the point on the plateau that also gives the lowest possible background counts. Therefore, it is the analyst's opinion that the operating voltage for scalar/detector 1F be set at 900 V.					
REVIEWED BY: Jay Fielding					

8 1/18/09


PLATEAU

OPERATING VOLTAGE FOR DETECTOR/SCALAR 1F



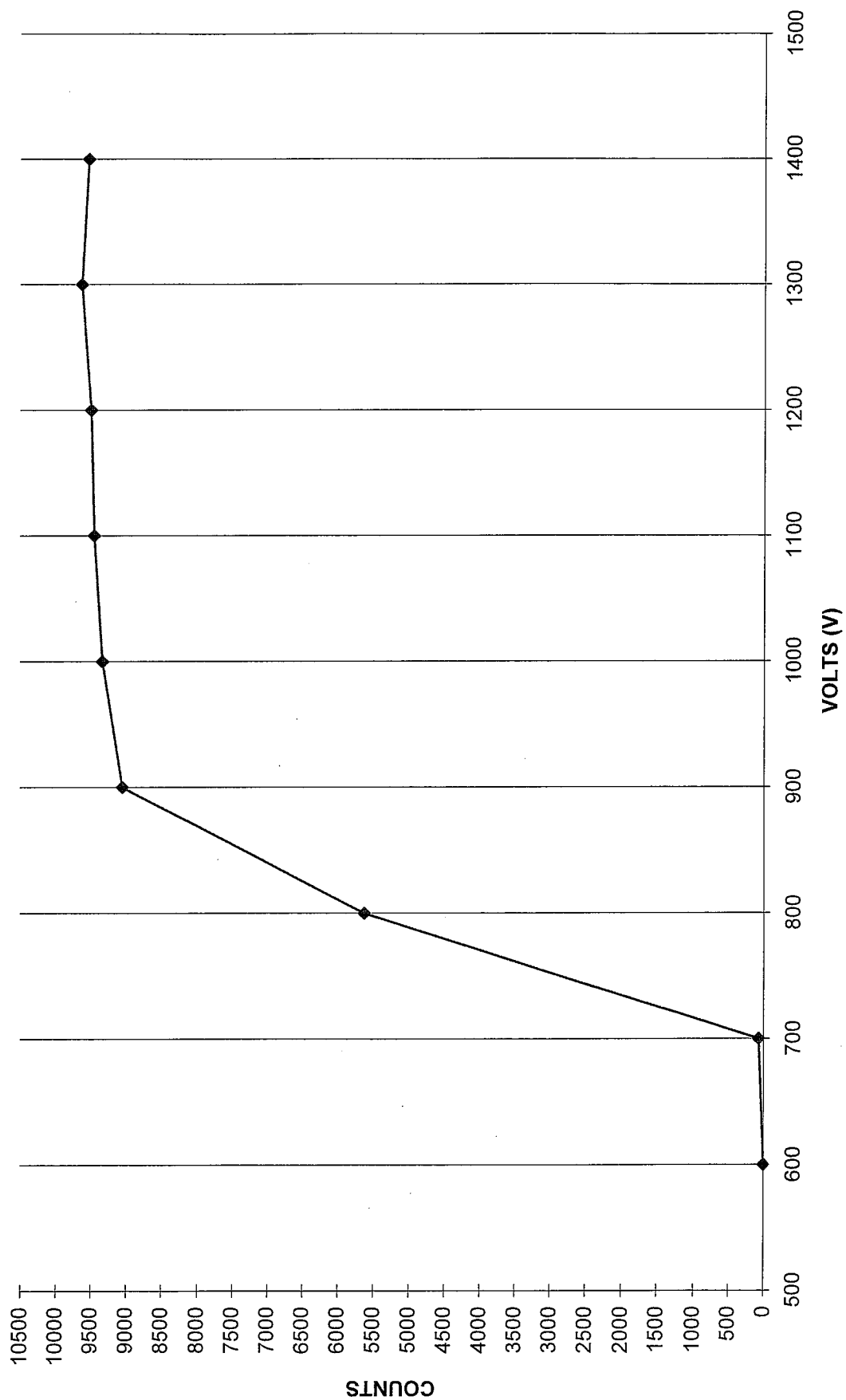
COUNTS

PHOTOMULTIPLIER/SCALAR OPERATING VOLTAGE					
²³⁰ Th SOURCE (18000 dpm) COUNTED FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES					
DATE:	1/14/2009	ANALYST:	LJF		
DETECTOR/SCALAR:	7A				
VOLTS	COUNTS				
600	0				
700	69				
800	5621				
900	9044				
1000	9331				
1100	9446				
1200	9490				
1300	9624				
1400	9528				
BACKGROUND (NO SOURCE) COUNTED MULTIPLE TIMES FOR 1 MINUTE AT SPECIFIED OPERATING VOLATGES.					
VOLTS	COUNTS (1)	COUNTS (2)	COUNTS (3)	COUNTS (4)	COUNTS (5)
900	0	0	0	0	0
1000	0	0	0	0	0
1100	0	0	0	0	0
1200	0	0	0	0	0
1300	2	0	0	3	1
The operating voltage chosen should be the point on the plateau that also gives the lowest possible background counts. Therefore, it is the analyst's opinion that the operating voltage for scalar/detector 7A be set at 1100 V.					
REVIEWED BY: Jay Fielding					


1/18/09

PLATEAU

OPERATING VOLTAGE FOR DETECTOR/SCALAR 7A



Voltage Plateaus for counters 3E, 2B, 6C, 5D, 1F, & 7A
(Th source for one minute @ each voltage)

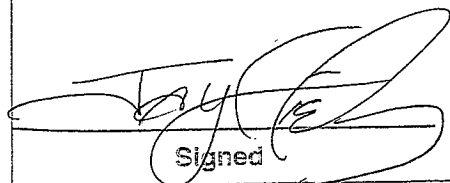
Volt (kv)	3E	2B	6C	5D	1F	7A
0.6	Ø	Ø	162	754	119	Ø
0.7	Ø	144	7408	8389	7196	69
0.8	Ø	5850	9488	9491	9270	5621
0.9	13	9143	9275	9404	9376	9044
1.0	1632	9387	9460	9562	9505	9331
1.1	7871	9620	9396	9569	9496	9446
1.2	9275	9619	10702	9792	9672	9490
1.3	9529	9655	—	11354	11128	9624
1.4	9687	9515	—	—	—	9528

Background counts (no source) at Plateau energies

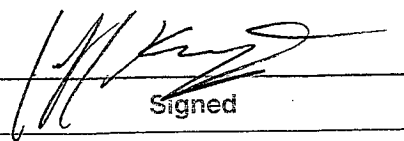
Volt (kv)	3E	2B	6C	5D	1F	7A
0.8	N/A	N/A	Ø,Ø,Ø,Ø	Ø,Ø,Ø,Ø	Ø,Ø,Ø,Ø	N/A
0.9	↓	Ø,Ø,Ø,Ø	Ø,Ø,Ø,Ø	Ø,Ø,Ø,Ø	Ø,Ø,Ø,Ø	Ø,Ø,Ø,Ø
1.0	↓	Ø,Ø,Ø,Ø	Ø,Ø,Ø,Ø	2,1,1,3,3	Ø,1,1,Ø,Ø	Ø,Ø,Ø,Ø,Ø
1.1	↓	Ø,Ø,Ø,Ø	3,4,4,6,2	N/A	3,4,3,2,1	Ø,Ø,Ø,Ø,Ø
1.2	Ø,Ø,Ø,Ø,Ø	Ø,Ø,1,Ø,Ø	N/A	↓	N/A	Ø,Ø,Ø,Ø,Ø
1.3	3,1,1,1,2	4,1,3,2,1	↓	↓	↓	2,Ø,Ø,3,1
1.4	N/A	N/A	↓	↓	↓	N/A

Continued on Page

Read and Understood By


Signed

1/19/09
Date


Signed

1/19/09
Date
96 of 263

Efficiency Data

11/21/09
97 of 263

Lucas Cell + PMT Calibration Control Summary

r:\inst\alphascnt\cell_cal.xls

Acceptance criteria: Passing ICV (control limits = 67-120%)

Detector + Flask ID	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14
Dates run 1/15/09 thru 1/27/09	DNU	DNU	0.7576	DNU	0.7570	0.7590	DNU	0.7886	DNU	DNU	DNU	DNU	Out of Service	0.7308
	FAIL	FAIL	FAIL	PASS	FAIL	FAIL	PASS	PASS	PASS	PASS	FAIL	FAIL	FAIL	PASS

DNU = DO NOT USE

LJF 1/28/2009

Reviewed By/Date

S 1/28/09

Lucas Cell + PMT Calibration Control Summary

r:\instalphscntcell_cal.xls

Acceptance criteria: Passing ICV (control limits = 67-120%)

Detector + Flask ID	B1	B2	B3	B4	B6	B7	B8	B9	B10	B12	B13	B14
Dates run 1/15/09 thru 1/27/09	DNU FAIL	DNU FAIL	1.8401 FAIL	DNU PASS	1.6760 FAIL	PASS	DNU FAIL	0.7866 PASS	1.5166 FAIL	1.0066 PASS	Out of Service	1.6973 PASS

DNU = DO NOT USE

LJF 1/28/2009

Reviewed By/Date

S 1/28/09

Lucas Cell + PMT Calibration Control Summary

r:\inst\alphsont\cell_cal.xls

Acceptance criteria: Passing ICV (control limits = 67-120%)

Detector + Flask ID	C20	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30	C31
Dates run 1/15/09 thru 1/27/09	DNU FAIL	DNU FAIL	1.3486 FAIL	PASS	DNU FAIL	1.9359 PASS	2.1968 PASS	DNU FAIL	1.6470 FAIL	DNU PASS	1.5056 PASS	DNU FAIL

DNU = DO NOT USE

LJF 1/28/2009

Reviewed By/Date

8/1/2009

Lucas Cell + PMT Calibration Control Summary

r:\inst\alphascnt\cell_cal.xls

Acceptance criteria: Passing ICV (control limits = 67-120%)

Detector + Flask ID	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31
Dates run 1/15/09 thru. 1/27/09	DNU	DNU	1.3192	DNU	1.9252	DNU	DNU	DNU	1.5280	DNU	1.4618	1.3444
	FAIL	FAIL	FAIL	PASS	FAIL	PASS	FAIL	FAIL	FAIL	PASS	FAIL	PASS

DNU = DO NOT USE

LJF 1/28/2009

Reviewed By/Date

8/12/2009

Lucas Cell + PMT Calibration Control Summary

r:\inst\alphscnt\cell_cal.xls

Acceptance criteria: Passing ICV (control limits = 67-120%)

Detector + Flask ID	F40		F41		F42		F43		F44		F45		F46		F47		F48		F49		F50		F51	
	DNU	FAIL	DNU	FAIL	1.3483	FAIL	DNU	PASS	0.9785	PASS	DNU	FAIL	0.9772	PASS	1.0751	PASS		Out of Service	1.4451	PASS	0.8737	PASS	DNU	FAIL
Dates run 1/15/09 thru: 1/27/09																								

DNU = DO NOT USE

LJF 1/28/2009

Reviewed By/Date

8/12/09

Lucas Cell + PMT Calibration Control Summary

r:\inst\alphscntcell_cal.xls

Acceptance criteria: Passing ICV (control limits = 67-120%)

Detector + Flask ID	A40	A41	A42	A43	A44	A45	A46	A47	A48	A49	A50	A51
Dates run 1/15/09 thru 1/27/09	DNU FAIL	DNU FAIL	1.4715 FAIL	DNU PASS	1.0369 FAIL	DNU PASS	1.0845 FAIL	1.2229 PASS	Out of Service PASS	1.5450 PASS	0.9484 PASS	DNU FAIL

DNU = DO NOT USE

LJF 1/28/2009

Reviewed By/Date

8 1/28/09

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Calibration results

Analyst: LJF

Prep. Date S: 06/14/06

Prep. Date C: 06/14/06

SOP Used: 783R8

Count Date: 1/15/2009

1/14/09
122124

W.O.#	S	Flask	Counter	Scaler	Ra-226	Efficiency
ID	No.	No.	No.	No.	Standard (dpm)	
07-18-511	S41	1	E	3	207.7580976	0.4227
07-18-511	S42	2	E	3	207.7580976	0.8902
07-18-511	S43	20	C	6	207.7580976	1.3454
07-18-511	S44	21	C	6	207.7580976	1.3742
07-18-511	S45	40	F	1	207.7580976	0.5691
07-18-511	S46	41	F	1	207.7580976	0.9725
07-18-511	S47	3	E	3	207.7580976	0.7576
07-18-511	S48	4	E	3	207.7580976	0.6649
07-18-511	S49	22	C	6	207.7580976	1.3486
07-18-511	S50	23	C	6	207.7580976	1.7894
07-18-511	S51	42	F	1	207.7580976	1.3483
07-18-511	S52	43	F	1	207.7580976	1.6143
07-18-511	S53	6	E	3	207.7580976	0.7570
07-18-511	S54	7	E	3	207.7580976	0.1856
07-18-511	S55	24	C	6	207.7580976	1.9359
07-18-511	S56	25	C	6	207.7580976	2.1968
07-18-511	S57	44	F	1	207.7580976	0.9785
07-18-511	S58	45	F	1	207.7580976	1.4937
07-18-511	S59	8	E	3	207.7580976	0.7590
07-18-511	S60	9	E	3	207.7580976	0.7866
07-18-511	S61	26	C	6	207.7580976	1.8531
07-18-511	S62	27	C	6	207.7580976	1.9009
07-18-511	S63	46	F	1	207.7580976	0.9772
07-18-511	S64	47	F	1	207.7580976	1.0751
07-18-511	S65	10	E	3	207.7580976	0.7099
07-18-511	S66	12	E	3	207.7580976	0.8036
07-18-511	S67	28	C	6	207.7580976	1.5470
07-18-511	S68	29	C	6	207.7580976	1.8558
07-18-511	S69	49	F	1	207.7580976	1.4451
07-18-511	S70	50	F	1	207.7580976	0.8737
07-18-511	S71	14	E	3	207.7580976	0.7308
07-18-511	S72	30	C	3	207.7580976	1.5056
07-18-511	S25	31	C	6	207.7580976	1.3109
07-18-511	S26	51	F	1	207.7580976	1.6593

' Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst:

LJF

Prep. Date S:

10/5/2007

Prep. Date C:

10/5/2007

SOP Used:

783R8

W.O.#	S	V	Purge (end)		Flask	Counter	Scaler	CBKG	CBKG (CORR.)	Deeman (end)		Count Start		Count		REMARKS
			Date	Time	No.	No.	No.	#		Date	Time	Date	Time	Duration	Count	
07-18-511	S41	1	10/5/2007	16:15	1	E	3	20	20	1/15/2009	11:05	1/15/2009	15:10	30	2570	
07-18-511	S42	1	10/5/2007	16:15	2	E	3	14	28	1/15/2009	11:05	1/15/2009	16:03	60	10676	
07-18-511	S43	1	10/5/2007	16:15	20	C	6	7	9	1/15/2009	11:05	1/15/2009	15:10	40	10823	
07-18-511	S44	1	10/5/2007	16:15	21	C	6	6	8	1/15/2009	11:05	1/15/2009	16:03	40	10980	
07-18-511	S45	1	10/5/2007	16:15	40	F	1	1	1	1/15/2009	11:05	1/15/2009	15:10	30	3434	
07-18-511	S46	1	10/5/2007	16:15	41	F	1	3	6	1/15/2009	11:05	1/15/2009	16:03	60	11638	
07-18-511	S47	1	10/5/2007	16:15	3	E	3	16	16	1/15/2009	11:30	1/15/2009	17:13	30	4530	
07-18-511	S48	1	10/5/2007	16:15	4	E	3	12	12	1/15/2009	11:30	1/15/2009	17:56	30	3952	
07-18-511	S49	1	10/5/2007	16:15	22	C	6	11	15	1/15/2009	11:30	1/15/2009	17:13	40	10721	
07-18-511	S50	1	10/5/2007	16:15	23	C	6	13	13	1/15/2009	11:30	1/15/2009	17:56	30	10617	
07-18-511	S51	1	10/5/2007	16:15	42	F	1	2	3	1/15/2009	11:30	1/15/2009	17:13	40	10707	
07-18-511	S52	1	10/5/2007	16:15	43	F	1	0	0	1/15/2009	11:30	1/15/2009	17:56	40	12747	
07-18-511	S53	1	10/5/2007	16:15	6	E	3	14	14	1/15/2009	12:38	1/15/2009	18:30	30	4519	
07-18-511	S54	1	10/5/2007	16:15	7	E	3	18	18	1/15/2009	12:38	1/15/2009	19:09	30	1117	
07-18-511	S55	1	10/5/2007	16:15	24	C	6	15	15	1/15/2009	12:38	1/15/2009	18:37	30	11526	
07-18-511	S56	1	10/5/2007	16:15	25	C	6	10	10	1/15/2009	12:38	1/15/2009	19:12	30	13015	
07-18-511	S57	1	10/5/2007	16:15	44	F	1	4	8	1/15/2009	12:38	1/15/2009	18:37	60	11623	
07-18-511	S58	1	10/5/2007	16:15	45	F	1	2	3	1/15/2009	12:38	1/15/2009	19:38	40	11747	
07-18-511	S59	1	10/5/2007	16:15	8	E	3	14	14	1/15/2009	13:44	1/15/2009	19:50	30	4523	
07-18-511	S60	1	10/5/2007	16:15	9	E	3	18	18	1/15/2009	13:44	1/15/2009	20:21	30	4673	
07-18-511	S61	1	10/5/2007	16:15	26	C	6	21	21	1/15/2009	13:44	1/15/2009	19:50	30	11030	
07-18-511	S62	1	10/5/2007	16:15	27	C	6	11	11	1/15/2009	13:44	1/15/2009	20:21	30	11260	
07-18-511	S63	1	10/5/2007	16:15	46	F	1	1	2	1/15/2009	13:44	1/15/2009	20:30	60	11533	
07-18-511	S64	1	10/5/2007	16:15	47	F	1	5	8	1/15/2009	13:44	1/15/2009	21:36	50	10499	
07-18-511	S65	1	10/5/2007	16:15	10	E	3	24	24	1/16/2009	10:06	1/16/2009	14:06	30	4309	
07-18-511	S66	1	10/5/2007	16:15	12	E	3	16	16	1/16/2009	10:06	1/16/2009	14:58	30	4835	
07-18-511	S67	1	10/5/2007	16:15	28	C	6	15	20	1/16/2009	10:06	1/16/2009	14:06	40	12462	
07-18-511	S68	1	10/5/2007	16:15	29	C	6	17	17	1/16/2009	10:06	1/16/2009	14:58	30	11145	
07-18-511	S69	1	10/5/2007	16:15	49	F	1	1	1	1/16/2009	10:06	1/16/2009	15:07	60	10459	
07-18-511	S70	1	10/5/2007	16:15	50	F	1	6	12	1/16/2009	10:56	1/16/2009	15:54	30	4399	
07-18-511	S71	1	10/5/2007	16:15	14	E	3	20	20	1/16/2009	10:56	1/16/2009	15:54	40	12036	
07-18-511	S72	1	10/5/2007	16:15	30	C	3	11	15	1/16/2009	10:56	1/16/2009	15:54	40	10750	
07-18-511	S25	1	6/29/2007	12:00	31	D	5	12	16	1/16/2009	10:56	1/16/2009	15:54	40	10750	
07-18-511	S26	1	6/29/2007	12:00	51	A	7	1	1	1/16/2009	10:56	1/16/2009	16:00	30	10808	

Spiked by: DBC on 10/5/2007
Spike Witness: EMF
Reviewed by:

Std./Ba Carrier ID	'Std./Carrier Type	Spike Vol. (ml)	p pipet No.	Activity added (dpm)	Ref. date
783R8 020.77	Ra 226	2.0	rs015	208	1/28/2005

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Calibration results

Analyst: LJF

Prep. Date S: 06/14/06

Prep. Date C: 06/14/06

SOP Used: 783R8

Count Date: 1/15/2009 - 1/14/2009

1/16/09
1/15
1/12/09

W.O.#	S ID	Flask No.	Counter No.	Scaler No.	Ra-226 Standard (dpm)	Efficiency
07-18-511	S41	1	B	2	207.7580976	1.2242
07-18-511	S42	2	B	2	207.7580976	1.8997
07-18-511	S43	20	D	5	207.7580976	1.3936
07-18-511	S44	21	D	5	207.7580976	1.3828
07-18-511	S45	40	A	7	207.7580976	0.6188
07-18-511	S46	41	A	7	207.7580976	1.0674
07-18-511	S47	3	B	2	207.7580976	1.8401
07-18-511	S48	4	B	2	207.7580976	1.5979
07-18-511	S49	22	D	5	207.7580976	1.3192
07-18-511	S50	23	D	5	207.7580976	1.8378
07-18-511	S51	42	A	7	207.7580976	1.4715
07-18-511	S52	43	A	7	207.7580976	1.7679
07-18-511	S53	6	B	2	207.7580976	1.6760
07-18-511	S54	7	B	2	207.7580976	0.5018
07-18-511	S55	24	D	5	207.7580976	1.9252
07-18-511	S56	25	D	5	207.7580976	2.1979
07-18-511	S57	44	A	7	207.7580976	1.0369
07-18-511	S58	45	A	7	207.7580976	1.6456
07-18-511	S59	8	B	2	207.7580976	1.6492
07-18-511	S60	9	B	2	207.7580976	1.9837
07-18-511	S61	26	D	5	207.7580976	1.8717
07-18-511	S62	27	D	5	207.7580976	1.9258
07-18-511	S63	46	A	7	207.7580976	1.0845
07-18-511	S64	47	A	7	207.7580976	1.2229
07-18-511	S65	10	B	2	207.7580976	1.5166
07-18-511	S66	12	B	2	207.7580976	1.0066
07-18-511	S67	28	D	5	207.7580976	1.5280
07-18-511	S68	29	D	5	207.7580976	1.9122
07-18-511	S69	49	A	7	207.7580976	1.5450
07-18-511	S70	50	A	7	207.7580976	0.9484
07-18-511	S71	14	B	2	207.7580976	1.6973
07-18-511	S72	30	D	5	207.7580976	1.4618
07-18-511	S25	31	D	5	207.7580976	1.3444
07-18-511	S26	51	A	7	207.7580976	1.8050

' Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: LJF
 Prep. Date S: 10/5/2007
 Prep. Date C: 10/5/2007
 SOP Used: 783R8

W.O.#	S	V	Purge (end)		Flask No.	Counter No.	Scaler No.	CBKG #	CBKG (CORR.)	Deeman. (end)		Count Start		Count Duration (min.)	REMARKS
			Date	Time						Date	Time	Date	Time		
			D1	T1						D2	T2	D3	T3		
07-18-511	S41	1	6/29/2007	12:00	1	B	2	9	15	1/15/2009	11:05	1/15/2009	16:03	50	12225
07-18-511	S42	1	6/29/2007	12:00	2	B	2	25	25	1/15/2009	11:05	1/15/2009	15:10	30	11484
07-18-511	S43	1	6/29/2007	12:00	20	D	5	18	24	1/15/2009	11:05	1/15/2009	16:03	40	11151
07-18-511	S44	1	6/29/2007	12:00	21	D	5	14	19	1/15/2009	11:05	1/15/2009	15:10	40	11133
07-18-511	S45	1	6/29/2007	12:00	40	A	7	3	3	1/15/2009	11:05	1/15/2009	16:03	30	3711
07-18-511	S46	1	6/29/2007	12:00	41	A	7	6	10	1/15/2009	11:05	1/15/2009	15:10	50	10728
07-18-511	S47	1	6/29/2007	12:00	3	B	2	24	24	1/15/2009	11:30	1/15/2009	17:56	30	10928
07-18-511	S48	1	6/29/2007	12:00	4	B	2	13	17	1/15/2009	11:30	1/15/2009	17:13	40	12703
07-18-511	S49	1	6/29/2007	12:00	22	D	5	16	21	1/15/2009	11:30	1/15/2009	17:56	40	10438
07-18-511	S50	1	6/29/2007	12:00	23	D	5	13	13	1/15/2009	11:30	1/15/2009	17:13	30	10963
07-18-511	S51	1	6/29/2007	12:00	42	A	7	2	3	1/15/2009	11:30	1/15/2009	17:56	40	11622
07-18-511	S52	1	6/29/2007	12:00	43	A	7	1	1	1/15/2009	11:30	1/15/2009	17:13	30	10534
07-18-511	S53	1	6/29/2007	12:00	6	B	2	16	21	1/15/2009	12:38	1/15/2009	19:09	40	13247
07-18-511	S54	1	6/29/2007	12:00	7	B	2	16	16	1/15/2009	12:38	1/15/2009	18:37	30	3000
07-18-511	S55	1	6/29/2007	12:00	24	D	5	22	22	1/15/2009	12:38	1/15/2009	19:12	30	11419
07-18-511	S56	1	6/29/2007	12:00	25	D	5	12	12	1/15/2009	12:38	1/15/2009	18:37	30	13081
07-18-511	S57	1	6/29/2007	12:00	44	A	7	5	8	1/15/2009	12:38	1/15/2009	19:38	50	10193
07-18-511	S58	1	6/29/2007	12:00	45	A	7	2	3	1/15/2009	12:38	1/15/2009	18:37	40	13041
07-18-511	S59	1	6/29/2007	12:00	8	B	2	14	19	1/15/2009	13:44	1/15/2009	20:21	40	13023
07-18-511	S60	1	6/29/2007	12:00	9	B	2	17	17	1/15/2009	13:44	1/15/2009	19:50	30	11802
07-18-511	S61	1	6/29/2007	12:00	26	D	5	24	24	1/15/2009	13:44	1/15/2009	20:21	30	11100
07-18-511	S62	1	6/29/2007	12:00	27	D	5	9	9	1/15/2009	13:44	1/15/2009	19:50	30	11450
07-18-511	S63	1	6/29/2007	12:00	46	A	7	1	2	1/15/2009	13:44	1/15/2009	21:36	50	10584
07-18-511	S64	1	6/29/2007	12:00	47	A	7	0	0	1/15/2009	13:44	1/15/2009	20:30	50	12032
07-18-511	S65	1	6/29/2007	12:00	10	B	2	17	23	1/16/2009	10:06	1/16/2009	14:58	40	12141
07-18-511	S66	1	6/29/2007	12:00	12	B	2	3310	4413	1/16/2009	10:06	1/16/2009	14:06	40	12509
07-18-511	S67	1	6/29/2007	12:00	28	D	5	9	12	1/16/2009	10:06	1/16/2009	14:58	40	12221
07-18-511	S68	1	6/29/2007	12:00	29	D	5	15	15	1/16/2009	10:06	1/16/2009	14:06	40	12509
07-18-511	S69	1	6/29/2007	12:00	49	A	7	2	3	1/16/2009	10:06	1/16/2009	15:07	30	11557
07-18-511	S70	1	6/29/2007	12:00	50	A	7	13	26	1/16/2009	10:56	1/16/2009	14:06	60	12334
07-18-511	S71	1	6/29/2007	12:00	14	B	2	12	12	1/16/2009	10:56	1/16/2009	16:26	30	10141
07-18-511	S72	1	6/29/2007	12:00	30	D	5	17	20	1/16/2009	10:56	1/16/2009	16:37	35	10180
07-18-511	S25	1	6/29/2007	12:00	31	D	5	12	16	1/16/2009	10:56	1/16/2009	15:54	40	10750
07-18-511	S26	1	6/29/2007	12:00	51	A	7	1	1	1/16/2009	10:56	1/16/2009	16:00	30	10808

Spiked by: DBC on 10/5/2007
 Spike Witness: EMF
 Reviewed by:

Std./Ba Carrier ID	'Std./Carrier Type	Spike Vol. (ml)	Activity added (dpm)	Ref. date
783R8 020-77	Ra 226	2.0	208	1/28/2005

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: BBC Silly LSF
 Prep. Date S: 6/28/2007 10/5/07
 Prep. Date C: 6/29/2007 10/5/07
 SOP Used: 783R8

W.O.#	S	V	S	Purge (end)	Time	Flask No.	Counter No.	Scaler No.	CBKG #	CBKG (CORR.)	Deeman. (end)		Count Start		Count Duration (min.)	COUNT #	REMARKS
											Date	Time	Date	Time			
07-18-511	S1	1	1	10/5/07 11:15	12:00					0							
07-18-511	S2	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S3	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S4	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S5	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S6	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S7	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S8	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S9	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S10	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S11	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S12	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S13	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S14	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S15	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S16	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S17	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S18	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S19	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S20	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S21	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S22	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S23	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S24	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S25	1	1	6/29/2007 12:00	12:00	31	C	6	15	0	11/6/09	1056	11/6/09	1637	40	10430	
07-18-511	S26	1	1	6/29/2007 12:00	12:00	50	F	1	8	0	↓	1056	↓	1634	31	10230	
07-18-511	S27	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S28	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S29	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S30	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S31	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S32	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S33	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S34	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S35	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S36	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S37	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S38	1	1	6/29/2007 12:00	12:00					0							
07-18-511	S39	1	1	6/29/2007 12:00	12:00					0							

10/5/07 16:15

07-18-511	S40	1	42:00	1	E	3	20	0	115109	115109	1510	30	2570	
07-18-511	S41	1	12:00	2	E	3	14	0			1603	60	10676	
07-18-511	S42	1	12:00	2	C	6	7	0			1510	40	10823	
07-18-511	S43	1	12:00	21	C	6	1186	0			1603	40	10980	
07-18-511	S44	1	12:00	40	F	1	1	0			1510	30	3434	
07-18-511	S45	1	12:00	41	F	1	3	0			1103	60	11638	
07-18-511	S46	1	12:00	3	E	3	16	0	115109	115109	1713	30	4530	
07-18-511	S47	1	12:00	4	E	3	12	0			1756	30	3952	
07-18-511	S48	1	12:00	22	C	6	11	0			1713	40	10721	
07-18-511	S49	1	12:00	23	C	6	13	0			1756	30	10617	
07-18-511	S50	1	12:00	42	F	1	2	0			1713	40	10707	
07-18-511	S51	1	12:00	43	F	1	0	0			1756	40	12747	
07-18-511	S52	1	12:00	586	E	3	14	0	115109	115109	1830	30	4519	
07-18-511	S53	1	12:00	11067	E	3	18	0			1830	30	1117	Valve broke, cell open
07-18-511	S54	1	12:00	24	C	6	15	0			1830	30	11576	
07-18-511	S55	1	12:00	25	C	6	10	0			1830	30	13015	
07-18-511	S56	1	12:00	44	F	1	4	0			1830	60	11623	
07-18-511	S57	1	12:00	45	F	1	2	0			1830	40	11747	
07-18-511	S58	1	12:00	48	E	3	14	0	115109	115109	1930	30	4523	
07-18-511	S59	1	12:00	1189	E	3	18	0			1930	30	4623	
07-18-511	S60	1	12:00	26	C	6	21	0			1930	40	4930	
07-18-511	S61	1	12:00	27	C	6	11	0			1930	30	11210	
07-18-511	S62	1	12:00	46	F	1	5	0			2030	60	11533	
07-18-511	S63	1	12:00	47	F	1	24	0			2130	60	10449	
07-18-511	S64	1	12:00	10	E	3	16	0	115109	115109	1406	30	51144	
07-18-511	S65	1	12:00	17	E	3	15	0			1458	30	4835	
07-18-511	S66	1	12:00	28	C	6	17	0			1406	40	17462	
07-18-511	S67	1	12:00	29	C	6	1	0			1458	30	11145	
07-18-511	S68	1	12:00	49	F	1	6	0			1406	40	11624	
07-18-511	S69	1	12:00	50	F	1	70	0			1507	60	10459	
07-18-511	S70	1	12:00	14	E	3	11	0	10:56		1554	30	4399	
07-18-511	S71	1	12:00	30	C	6	11	0			1554	40	12036	
07-18-511	S72	1	12:00	30	C	6	11	0			1554	40	12036	

Sid./Carrier ID	Carrier Type	Spike Vol. (ml)	Pipet No.	Activity added (dpm)	Ref. date
783.3020.77	Ra 226	2.0	rs015	208	1/28/2005

Spiked by: DBC on 10/5/2007
 Spike Witness: EMF 10/5/2007
 Reviewed by:

STANDARD NEEDS REVERIFICATION!!!

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: BBB 8/1/19 LJF

Prep. Date: 8/29/2007 10/5/07

Prep. Date: 8/29/2007 10/5/07

SOP Used: 783R8

W.O.#	S	ID	V	S	Purge (end)		Flask No.	Counter No.	Scaler No.	CBKG #	CBKG (CORR.)	Deeman (end)		Count Start		Count		REMARKS
					Date	Time						Date	Time	Date	Time	Duration (min.)	COUNT #	
07-18-511	1	S1	1	1	6/29/2007	12:00					0							
07-18-511	1	S2	1	1	6/29/2007	12:00					0							
07-18-511	1	S3	1	1	6/29/2007	12:00					0							
07-18-511	1	S4	1	1	6/29/2007	12:00					0							
07-18-511	1	S5	1	1	6/29/2007	12:00					0							
07-18-511	1	S6	1	1	6/29/2007	12:00					0							
07-18-511	1	S7	1	1	6/29/2007	12:00					0							
07-18-511	1	S8	1	1	6/29/2007	12:00					0							
07-18-511	1	S9	1	1	6/29/2007	12:00					0							
07-18-511	1	S10	1	1	6/29/2007	12:00					0							
07-18-511	1	S11	1	1	6/29/2007	12:00					0							
07-18-511	1	S12	1	1	6/29/2007	12:00					0							
07-18-511	1	S13	1	1	6/29/2007	12:00					0							
07-18-511	1	S14	1	1	6/29/2007	12:00					0							
07-18-511	1	S15	1	1	6/29/2007	12:00					0							
07-18-511	1	S16	1	1	6/29/2007	12:00					0							
07-18-511	1	S17	1	1	6/29/2007	12:00					0							
07-18-511	1	S18	1	1	6/29/2007	12:00					0							
07-18-511	1	S19	1	1	6/29/2007	12:00					0							
07-18-511	1	S20	1	1	6/29/2007	12:00					0							
07-18-511	1	S21	1	1	6/29/2007	12:00					0							
07-18-511	1	S22	1	1	6/29/2007	12:00					0							
07-18-511	1	S23	1	1	6/29/2007	12:00					0							
07-18-511	1	S24	1	1	6/29/2007	12:00					0							
07-18-511	1	S25	1	1	6/29/2007	12:00					0							
07-18-511	1	S26	1	1	6/29/2007	12:00					0							
07-18-511	1	S27	1	1	6/29/2007	12:00					0							
07-18-511	1	S28	1	1	6/29/2007	12:00					0							
07-18-511	1	S29	1	1	6/29/2007	12:00					0							
07-18-511	1	S30	1	1	6/29/2007	12:00					0							
07-18-511	1	S31	1	1	6/29/2007	12:00					0							
07-18-511	1	S32	1	1	6/29/2007	12:00					0							
07-18-511	1	S33	1	1	6/29/2007	12:00					0							
07-18-511	1	S34	1	1	6/29/2007	12:00					0							
07-18-511	1	S35	1	1	6/29/2007	12:00					0							
07-18-511	1	S36	1	1	6/29/2007	12:00					0							
07-18-511	1	S37	1	1	6/29/2007	12:00					0							
07-18-511	1	S38	1	1	6/29/2007	12:00					0							
07-18-511	1	S39	1	1	6/29/2007	12:00					0							
07-18-511	1	S40	1	1	6/29/2007	12:00					0							
07-18-511	1	S41	1	1	6/29/2007	12:00					0							
07-18-511	1	S42	1	1	6/29/2007	12:00					0							
07-18-511	1	S43	1	1	6/29/2007	12:00					0							
07-18-511	1	S44	1	1	6/29/2007	12:00					0							
07-18-511	1	S45	1	1	6/29/2007	12:00					0							
07-18-511	1	S46	1	1	6/29/2007	12:00					0							
07-18-511	1	S47	1	1	6/29/2007	12:00					0							
07-18-511	1	S48	1	1	6/29/2007	12:00					0							
07-18-511	1	S49	1	1	6/29/2007	12:00					0							
07-18-511	1	S50	1	1	6/29/2007	12:00					0							
07-18-511	1	S51	1	1	6/29/2007	12:00					0							
07-18-511	1	S52	1	1	6/29/2007	12:00					0							
07-18-511	1	S53	1	1	6/29/2007	12:00					0							
07-18-511	1	S54	1	1	6/29/2007	12:00					0							
07-18-511	1	S55	1	1	6/29/2007	12:00					0							
07-18-511	1	S56	1	1	6/29/2007	12:00					0							
07-18-511	1	S57	1	1	6/29/2007	12:00					0							
07-18-511	1	S58	1	1	6/29/2007	12:00					0							
07-18-511	1	S59	1	1	6/29/2007	12:00					0							
07-18-511	1	S60	1	1	6/29/2007	12:00					0							
07-18-511	1	S61	1	1	6/29/2007	12:00					0							
07-18-511	1	S62	1	1	6/29/2007	12:00					0							
07-18-511	1	S63	1	1	6/29/2007	12:00					0							
07-18-511	1	S64	1	1	6/29/2007	12:00					0							
07-18-511	1	S65	1	1	6/29/2007	12:00					0							
07-18-511	1	S66	1	1	6/29/2007	12:00					0							
07-18-511	1	S67	1	1	6/29/2007	12:00					0							
07-18-511	1	S68	1	1	6/29/2007	12:00					0							
07-18-511	1	S69	1	1	6/29/2007	12:00					0							
07-18-511	1	S70	1	1	6/29/2007	12:00					0							
07-18-511	1	S71	1	1	6/29/2007	12:00					0							
07-18-511	1	S72	1	1	6/29/2007	12:00					0							
07-18-511	1	S73	1	1	6/29/2007	12:00					0							
07-18-511	1	S74	1	1	6/29/2007	12:00					0							
07-18-511	1	S75	1	1	6/29/2007	12:00					0							
07-18-511	1	S76	1	1	6/29/2007	12:00					0							
07-18-511	1	S77	1	1	6/29/2007	12:00					0							
07-18-511	1	S78	1	1	6/29/2007	12:00					0							
07-18-511	1	S79	1	1	6/29/2007	12:00					0							
07-18-511	1	S80	1	1	6/29/2007	12:00					0							
07-18-511	1	S81	1	1	6/29/2007	12:00					0							
07-18-511	1	S82	1	1	6/29/2007	12:00					0							
07-18-511	1	S83	1	1	6/29/2007	12:00					0							
07-18-511	1	S84	1	1	6/29/2007	12:00					0							
07-18-511	1	S85	1	1	6/29/2007	12:00					0							
07-18-511	1	S86	1	1	6/29/2007	12:00					0							
07-18-511	1	S87	1	1	6/29/2007	12:00					0							
07-18-511	1	S88	1	1	6/29/2007	12:00					0							
07-18-511	1	S89	1	1	6/29/2007	12:00					0							
07-18-511	1	S90	1	1	6/29/2007	12:00					0							
07-18-511	1	S91	1	1	6/29/2007	12:00					0							
07-18-511	1	S92	1	1	6/29/2007	12:00					0							
07-18-511	1	S93	1	1	6/29/2007	12:00					0							
07-18-511	1	S94	1	1	6/29/2007	12:00					0							
07-18-511	1	S95	1	1	6/29/2007	12:00					0							
07-18-511	1	S96	1	1	6/29/2007	12:00					0							
07-18-511	1	S97	1	1	6/29/2007	12:00					0							
07-18-511	1	S98	1	1	6/29/2007	12:00												

10/15/07 16:15

07-18-511	S43	1	6/29/2007	12:00	20	D	5	18	0	11/5/09	11:05	11/5/09	16:03	40	11/5/	
07-18-511	S44	1	6/29/2007	12:00	21	D	5	14	0				15:10	40	11/33	
07-18-511	S45	1	6/29/2007	12:00	40	A	7	3	0				16:03	30	3711	
07-18-511	S46	1	6/29/2007	12:00	41	A	7	6	0				15:10	50	10728	
07-18-511	S47	1	6/29/2007	12:00	3	B	2	24	0		11:30		17:56	30	3711 10728	
07-18-511	S48	1	6/29/2007	12:00	4	B	2	13	0				17:13	40	12703	
07-18-511	S49	1	6/29/2007	12:00	22	D	5	16	0				17:13	30	10963	
07-18-511	S50	1	6/29/2007	12:00	23	D	5	13	0				17:56	40	11622	
07-18-511	S51	1	6/29/2007	12:00	42	A	7	2	0				17:13	30	10534	
07-18-511	S52	1	6/29/2007	12:00	43	A	7	1	0				19:09	40	13747	
07-18-511	S53	1	6/29/2007	12:00	6	B	2	16	0	11/5/09	10:38	11/5/09	18:37	30	3690	
07-18-511	S54	1	6/29/2007	12:00	7	B	2	22	0				19:12	30	11419	
07-18-511	S55	1	6/29/2007	12:00	24	D	5	12	0				18:37	30	13081	
07-18-511	S56	1	6/29/2007	12:00	25	D	5	5	0				19:38	30	10193	
07-18-511	S57	1	6/29/2007	12:00	44	A	7	5	0				18:37	40	13041	
07-18-511	S58	1	6/29/2007	12:00	45	A	7	2	0				20:21	30	11100	
07-18-511	S59	1	6/29/2007	12:00	8	B	2	14	0		13:44		19:50	30	11450	
07-18-511	S60	1	6/29/2007	12:00	9	B	2	17	0				21:36	50	10584	
07-18-511	S61	1	6/29/2007	12:00	26	D	5	9	0				20:30	50	12632	
07-18-511	S62	1	6/29/2007	12:00	27	D	5	1	0				14:58	40	12141	
07-18-511	S63	1	6/29/2007	12:00	46	A	7	0	0				14:06	40	12589	
07-18-511	S64	1	6/29/2007	12:00	47	A	7	17	0	11/6/09	10:06	11/6/09	14:58	40	12221	
07-18-511	S65	1	6/29/2007	12:00	10	B	2	3310	0				14:06	40	11557	
07-18-511	S66	1	6/29/2007	12:00	12	B	2	9	0				15:07	40	12324	
07-18-511	S67	1	6/29/2007	12:00	28	D	5	15	0				14:06	60	11525	
07-18-511	S68	1	6/29/2007	12:00	29	D	5	2	0				16:26	30	10141	
07-18-511	S69	1	6/29/2007	12:00	49	A	7	13	0				16:37	35	10180	
07-18-511	S70	1	6/29/2007	12:00	50	A	7	12	0							
07-18-511	S71	1	6/29/2007	12:00	14	B	2	12	0		10:56					
07-18-511	S72	1	6/29/2007	12:00	30	D	5	17	0							

2119

Sid./Ba	Carrier ID	Sid./Carrier Type	Spike Vol. (ml)	Pipet No.	Activity added (dpm)	Ref. date
783.3020.77		Ra 226	2.0	rs015	208	1/28/2005

Spiked by: DBC on 10/5/2007
Spike Witness: EMF 10/5/2007
Reviewed by:

370032

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
Check source	N/A	SD	th	N/A					1/12/09	922	9521	1	b	
↓	↓	IF	↓	↓					↓	927	9342	↓	b	
		7A							↓	929	9606	↓	b	
REG01229-1115 REOV1229-1		2B	14	20	1/12/09	925	15	8	1/12/09	1609	10823	15	b	
Check Source	N/A	3E	th	N/A					1/12/09	1634	9612	1	b	
↓	↓	2B	↓	↓					↓	1635	9653	↓	b	
		6C							↓	1639	9600	↓	b	
		SD							↓	1640	9514	↓	b	
↓	↓	IF	↓	↓					↓	1642	9434	↓	b	
		7A							↓	1643	9500	↓	b	
Check Source	N/A	3E	th	N/A					1/15/09	833	9239	1	b	
↓	↓	2B	↓	↓					↓	835	9536	↓	b	
		6C							↓	836	9582	↓	b	
		SD							↓	839	9556	↓	b	
↓	↓	IF	↓	↓					↓	841	9451	↓	b	
		7A							↓	843	9344	↓	b	
0716511-341	N/A	3E	1	N/A	1/15/09	852	20	30		15:10	2570	30	b	
-342		2B	2				25			↓	11484	↓	b	
-343		3E	2				14			16:03	10676	60	b	
-344		2B	1				9			↓	12225	50	b	
0716511-343		6C	20				7			15:10	10823	40	b	
0716511-344		SD	21				14			↓	11133	↓	b	
0716511-344		6C	21				6			16:03	10980	40	b	

Comments:

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370032

Reviewed by/date:

S 1/13/09

370033

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Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
07-18511-S43	NA	SD	20	NA	1/15/09	85923	18	30	8	1/15/09	1603	11151	40	8
-S45		IF	40			852	1		8		1610	3434	30	8
-S46		7A	41			↓	6		8		↓	10728	50	8
-S46		IF	41			923	3		8		1603	11630	160	8
-S45		7A	40			↓	3		8		↓	3711	30	8
-S47		3E	3			957	16		8		1713	4530	↓	8
-S48		2B	4			↓	13		8		↓	12703	40	8
-S48		SD3E	4			1030	12		8		1756	3952	30	8
-S47		1153E2B	3			↓	24		8		↓	10928	↓	8
-S49		6C	22			957	11		8		1713	16721	40	8
-S50		SD	23			↓	13		8		↓	10923	30	8
-S50		SD60	23			1030	13		8		1756	10617	↓	8
-S49		1156CSP	22			↓	16		8		↓	10438	40	8
-S51		IF	42			957	2		8		1713	10707	40	8
-S52		7A	43			↓	1		8		↓	10534	30	8
-S52		SD3E	43			1030	0		8		1756	12947	40	8
-S51		1151P7A	42			↓	2		8		↓	11622	↓	8
-S53		3E	6			1103	14		8		1830	4519	30	8
-S51		2B	7			↓	16		8		1857	300	↓	8
-S54		SD3E	7			1137	18		8		1909	1117	30	8
-S53		1162E2A	6			↓	16		8		↓	13247	40	8
-S55		6C	24			1103	15		8		1857	11526	30	8
-S56		SD	25			↓	12		8		↓	13081	↓	8

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370033

Reviewed by/date:

S 1/18/09

370034

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Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
0718511-356	N/A	5586	25	N/A	01/15/09	1137	10	30	1/15/09	1912	1305	30	6	
-355		5586	24			↓	22			↓	11419	↓	6	
-357		IF	44			1103	4			1837	11623	60	6	
-358		7A	45			↓	2			↓	13041	40	6	
-358		IF	45			1137	2			1938	11747	40	6	
-357		7A	44			↓	5			↓	10993	50	6	
-359		3E	8			1209	14			1950	4523	30	6	
-360		2B	9			↓	17			↓	11862	↓	6	
-360		3E	9			1242	18			2021	4673	30	6	
-359		2B	8			↓	14			↓	13023	40	6	
-361		6C	26			1209	21			1950	11030	30	6	
-362		5D	27			↓	9			↓	11450	↓	6	
-362		6C	27			1242	11			2021	11260	30	6	
-361		5D	26			↓	24			↓	11100	30	6	
-363		IF	46			1209	1			2030	11533	60	6	
-364		7A	47			↓	0			↓	12032	50	6	
-364		IF	47			1242	5			21360	10499	50	6	
-363		7A	46			↓	1			↓	10584	50	6	
check source	N/A	3E	Th	N/A						2226	9394	1	6	
		2B	1	N/A						2231	9436	1	6	
		6C	↓							2232	9562	↓	6	
		5D	↓							2233	9524	↓	6	
		IF	↓							2235	9455	↓	6	

Comments:

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Form 795-3.xls (11/14/05)

370034

Reviewed by/date: 8/1/09

370035

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Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
Check Source	N/A	7A	TH	N/A						1/15/09	2236	9338	1	8
Check Source	N/A	3E	TH	N/A						1/16/09	744	9272	1	8
↓		2B									745	9403		8
		6C									746	9634		8
		SD									748	9323		8
		IF									749	9413		8
		7A		↓	✓						750	9409	✓	8
07 13 511-565	N/A	3E	10	N/A	1/16/09	753	24	30			1400	4309	30	8
↓	-566	2B	12			↓	14					12509	40	8
	-566	3E	12			828	14				1458	4635	30	8
	-565	2B	10			↓	17				↓	1241	40	8
	-567	6C	28			753	15				1406	12462	40	8
	-568	SD	29			↓	15				↓	11557	30	8
	-568	6C	29			828	17				1458	11145	↓	8
	-567	SD	28			↓	9				↓	1221	40	8
	-569	IF	49			753	1				1406	11624	40	8
	-570	7A	50			↓	13				↓	11525	60	8
	-570	IF	50			828	6				1507	10459	60	0AC
	-569	7A	49			↓	2				1507	12334	40	0AC
	-571	3E	28B14			919	20				1554	9399	30	0AC
	-571	2B	14			955	12				16:20	10141	30	0AC
	-57245	6C	30			919	11				1554	12036	40	0AC
	-573	SD	31		↓	✓	↓	12			↓	10750	40	0AC

Comments:

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Form 7953.xls (11/14/05)

370035

Reviewed by/Date

0AC 1/16/09

370036

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start Date	Time	Counts	Dur. (min.)	Pos. Chk.
					Date	Time								
0718511-37325	N/A	6C	31	N/A	11/16/09	9:55	15	30	10430	16:37	11/16/09	40	S	
↓	↓	5D	30	↓	↓	↓	17	↓	10180	↓	↓	35	S	
↓	↓	1F	51	↓	↓	9:19	8	↓	6230	16:34	↓	31	ABC	
↓	↓	7A	51	↓	↓	9:55	1	↓	10808	16:00	↓	30	ABC	
Check Source	N/A	3E	Th	N/A	↓	↓	↓	↓	9372	17:00	11/16/09	1	ABC	
↓	↓	2B	↓	↓	↓	↓	↓	↓	9510	17:01	↓	↓	ABC	
↓	↓	6C	↓	↓	↓	↓	↓	↓	9437	18:33	↓	↓	6	
↓	↓	5D	↓	↓	↓	↓	↓	↓	9396	18:36	↓	↓	6	
↓	↓	1F	↓	↓	↓	↓	↓	↓	9378	17:06	↓	↓	ABC	
↓	↓	7A	↓	↓	↓	↓	↓	↓	9595	17:02	↓	↓	ABC	
Check Source	N/A	3E	Th	N/A	↓	↓	↓	↓	9215	11:11	11/18/09	1	6	
↓	↓	2B	↓	↓	↓	↓	↓	↓	9399	11:12	↓	↓	6	
↓	↓	6C	↓	↓	↓	↓	↓	↓	9381	11:14	↓	↓	6	
↓	↓	5D	↓	↓	↓	↓	↓	↓	9515	11:16	↓	↓	6	
↓	↓	1F	↓	↓	↓	↓	↓	↓	9516	11:17	↓	↓	6	
↓	↓	7A	↓	↓	↓	↓	↓	↓	9437	11:18	↓	↓	6	
08116503-ICV1	N/A	3E	1	N/A	11/18/09	11:20	12	15	363	17:26	↓	15	6	
↓	↓	2B	2	↓	↓	↓	23	↓	1625	↓	↓	↓	6	
↓	↓	3E	2	↓	↓	11:37	18	↓	773	17:44	↓	↓	6	
↓	↓	2B	1	↓	↓	↓	25	↓	1184	↓	↓	↓	6	
↓	↓	6C	20	↓	↓	11:20	36	↓	1246	17:28	↓	↓	6	
↓	↓	5D	21	↓	↓	↓	50	↓	598	↓	↓	↓	6	
↓	↓	6C	21	↓	↓	11:37	53	↓	1130	17:44	↓	↓	6	

Comments: 6/1/05

370036

Form 795-3.xls (11/14/05)

Reviewed by/date: 8/1/09

Prepare a working level dilution of 783.2613.72 to a final concentration of ~100 dpm/mL using 0.1M HCl

① Determine the density of 0.1M HCl

Mass of empty 100mL glass flask: 62.4616g lot # 061842

Mass of flask + 100mL 0.1M HCl: 162.3412g

Net mass of 0.1M HCl: 99.8716g

$\rho = 0.9987 \text{ g/mL}$

Bel
12



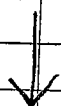
② Transfer std to 1L Nalgene

Mass of bottle w/o lid: 74.1318g

Mass of bottle + std: 77.9055g

Net mass of std transferred: 3.8232g

12



③ Dilute w/ 0.1M HCl

Mass of bottle + std + 0.1M HCl: 1097.0g

Mass of bottle (from above): 74.1318g

Net mass of standard: 1022.8682g

26



④ Final Activity Calculation

$$\frac{(27768.35 \text{ dpm/mL})(3.8232 \text{ g})(0.9987 \text{ g/mL})}{(0.9982 \text{ g/mL})(1022.8682 \text{ g})} = 103.84 \text{ dpm/mL}$$

* Note the density of 783.2613.72 is 0.9982 g/mL

Std ID: 783.3020.77

Description: Ra-226

Expiration: 6/15/08

Activity: 103.84 dpm/ml

sig. Uncert: 3.43 dpm/ml

Ref. Date: 1/28/05

Ref Time: n/a

Prep Date: 3/9/07 Prep by: ALB

Matrix/Comp. 0.1 M HCl

Half Life (y): 1.60E+03

Continued on Page

Read and Understood By

ALB
Signed

3/9/07
Date

ALB
Signed

10/5/07
Date

PREPARE A PRIMARY DILUTION OF RSO# 783 BY DILUTING TO 40 ml WITH 0.1 M HCl.

1. DETERMINE DENSITY OF 0.1 M HCl

MASS OF CLASS A VOLUMETRIC FLASK (100 ml): 68.6008 g Bal 12

MASS OF FLASK + 100 ml 0.1 M HCl: 168.4208 g

NET MASS OF 0.1 M HCl: 99.82 g

LOT# 44042

$\rho = 0.9982 \text{ g/ml}$

2. TRANSFER CONTENTS OF AMPULE - RSO# 783 TO A 40 ml VOA VIAL

MASS OF EMPTY 40 ml VOA VIAL w/o LID: 21.4763 g Bal 12

MASS OF OPEN AMPULE + 50 ml BEAKER: 37.8692 g

MASS OF EMPTY AMPULE + 50 ml BEAKER: 32.9096 g

NET MASS OF STD. TRANSFERRED: 4.9596 g

3. FINAL DILUTION WITH 0.1 M HCl

MASS OF EMPTY 40 ml VOA VIAL w/o LID (FROM ABOVE): 21.4763 g Bal 12

MASS OF VIAL + STD + 0.1 M HCl: 61.4738 g

NET MASS OF STD + 0.1 M HCl: 39.9975 g

4. FINAL ACTIVITY CALCULATION

$$\frac{(1.877 \times 10^4 \text{ dps}) (60 \text{ dpm/dps}) (4.9596 \text{ g}) (0.9982 \text{ g/ml})}{(5.01992 \text{ g}) (39.9975 \text{ g})} = 27,768.3514 \text{ dpm/ml}$$

ANALYTICS

1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677

Ra-226

SRS 70034-307

Qty 5.07E-1

ICI QA

Date 01/28/05

12:00 EST

Exp. XXXXXX

PO # 71239, Item 1

5.01992 grams 0.1M HCl solution



CAUTION RADIOACTIVE MATERIAL

Continued on Page

Read and Understood By

[Signature]

Signed

2/15/05

Date

[Signature]

Signed

3/14/05

118 of 263

ANALYTICS

RSO# 783
Rec'd 2/2/05
JOS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 • U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

70034-307

Ra-226 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked with a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

Analytics maintains traceability to the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

ISOTOPE:	Ra-226
ACTIVITY (dps):	1.877 E4
HALF-LIFE:	1.600 E3 years
CALIBRATION DATE:	January 28, 2005 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities: γ -impurities (other than decay products) <0.1%

5.01992 grams 0.1M HCl solution with 50 μ g/g Ba carrier.

P O NUMBER 71239, Item 1

SOURCE PREPARED BY: M. Dimitrova
M. Dimitrova, Radiochemist

Q A APPROVED:

hmmty 2/2/05

Ra-226 Standard Verification: For Use In Ra-Sr Lab

Std: 783.3020.77
Date 6/15/2007

Known Act:	103.84	dpm/mL	46774.8	pCi/L
Volume:	1000	mL		

	Det	Act. (pCi/L)	Act. (pCi/mL)	Ave Act	2 Std Dev	% Recovery	Ave Rec w/in 5% (PAI)	2 Std Dev w/in 10% Ave (ICPT)
Count 1	2	44200	44.2			94.5%	96.6%	0.094
Count 2	6	43200	43.2			92.4%	Pass	Pass
Count 3	4	48100	48.1	45166.7	4227.9	102.8%		

r:\inst\gamma\783.3020.77-Ra226

OK
JDS
10/15/07

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0718001-1 RA-226 VER 783.3020.77

 Sampling Start: 01/28/2005 10:00:00 | Counting Start: 06/13/2007 09:02:14
 Sampling Stop: 01/28/2005 10:00:00 | Decay Time. 2.08E+004 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 7200 Sec
 Sample Size 1.00E+000 L | Real Time 7417 Sec
 Collection Efficiency 1.0000 | Spc. File 070887D02.SPC

Detector #: 2 (Detector 2)

Energy(keV) = -0.67 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 06/13/2007
 FWHM(keV) = 0.69 + 0.005*En + 9.43E-04*En^2 + 0.00E+00*En^3 05/07/2007

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.58	94.42	631	150	116	2980	0.65	a
2	53.22	107.68	347	193	156	4468	0.93	a
3	74.76	150.72	5286	242	159	5096	0.80	a HiResid Wide Pk
4	75.21	151.62	309	354	290	10941	1.83	b HiResid
5	77.04	155.27	10220	273	151	4593	0.80	c HiResid
6	81.10	163.39	99	124	100	2483	0.42	d NET< CL HiResid
7	83.79	168.75	485	152	120	3173	0.68	e HiResid
8	87.14	175.45	4247	230	155	4465	1.03	f HiResid
9	89.80	180.78	1826	222	168	4833	1.08	g HiResid
10	94.61	190.38	520	264	214	6326	1.59	h HiResid
11	186.16	373.30	11993	275	137	3786	0.88	a
12	196.17	393.29	153	138	112	2781	0.62	a
13	221.18	443.27	95	141	115	2666	0.79	a NET< CL
14	241.98	484.83	11240	260	123	2807	0.97	a
15	258.86	518.56	694	149	115	2441	0.93	a
16	274.55	549.91	561	171	136	2909	1.31	a
17	295.22	591.20	25096	340	102	1939	1.04	a
18	314.52	629.77	59	73	59	847	0.53	a NET< CL
19	349.34	699.34	488	224	181	3626	2.22	a Wide Pk
20	351.87	704.39	41400	426	103	1813	1.10	b
21	386.82	774.23	300	120	95	1535	1.16	a
22	388.89	778.37	387	134	105	1755	1.37	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
23	405.67	811.89	139	148	120	2127	1.52	a
24	428.53	857.57	64	72	58	833	0.60	a
25	439.80	880.07	58	77	62	872	0.86	a NET< CL
26	454.83	910.11	233	93	73	1038	1.17	a
27	461.70	923.83	193	110	88	1334	1.44	b
28	474.64	949.69	37	60	48	569	0.62	a NET< CL
29	480.47	961.34	305	102	78	1138	1.27	b
30	487.05	974.50	231	83	64	854	1.04	c
31	510.73	1021.80	466	148	117	1748	2.38	a Wide Pk
32	533.64	1067.57	143	79	62	761	1.11	a
33	536.88	1074.05	112	86	69	870	1.35	b
34	543.36	1087.01	104	94	76	995	1.48	a
35	580.23	1160.66	216	79	60	716	1.12	a
36	609.33	1218.80	31676	366	70	853	1.41	a
37	665.59	1331.22	939	94	59	606	1.43	a
38	683.30	1366.60	55	54	43	392	1.02	a
39	703.22	1406.40	304	93	71	789	1.75	a
40	719.89	1439.72	201	77	59	610	1.40	a
41	742.13	1484.14	100	71	56	608	1.44	a
42	768.49	1536.82	2715	128	61	679	1.58	a
43	786.03	1571.87	626	84	56	608	1.47	a
44	806.37	1612.50	696	84	54	566	1.52	a
45	821.25	1642.23	96	48	36	322	0.86	a
46	826.36	1652.45	63	58	46	451	1.08	b
47	839.18	1678.06	337	81	59	650	1.69	a
48	934.24	1867.99	1511	101	53	556	1.53	a
49	964.33	1928.10	174	67	51	504	1.50	a
50	1051.82	2102.93	79	63	50	458	1.68	a
51	1070.09	2139.42	110	45	33	271	1.05	a
52	1104.70	2208.59	51	52	41	370	1.39	a
53	1120.36	2239.87	6409	172	51	486	1.98	a
54	1133.46	2266.04	135	66	51	484	1.96	a
55	1155.45	2309.98	673	81	51	490	1.88	a
56	1182.55	2364.13	82	63	50	463	1.97	a
57	1207.82	2414.61	185	57	41	342	1.70	a
58	1238.27	2475.45	2480	114	45	379	2.01	a
59	1253.60	2506.08	116	69	54	495	2.36	a
60	1281.08	2560.99	493	69	43	365	1.78	a
61	1303.64	2606.06	68	43	33	243	1.37	a
62	1377.69	2754.01	1556	96	45	382	2.01	a
63	1385.32	2769.27	231	57	40	318	1.56	b
64	1401.68	2801.95	531	80	54	455	2.57	a
65	1408.17	2814.93	853	81	46	369	2.15	b
66	1509.29	3016.97	751	85	53	470	2.51	a
67	1538.70	3075.74	118	58	44	359	1.95	a
68	1543.81	3085.94	150	62	47	389	2.18	b
69	1583.20	3164.65	180	61	45	361	2.05	a
70	1594.86	3187.94	36	47	37	278	1.71	b NET< CL
71	1661.65	3321.38	329	57	36	226	2.25	a

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PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
72	1684.20	3366.45	47	29	21	99	1.27	a
73	1692.83	3383.68	62	40	30	161	2.16	b
74	1729.65	3457.26	979	74	32	167	2.59	a
75	1764.58	3527.04	5035	146	30	139	2.57	a
76	1838.22	3674.18	88	37	26	119	2.36	a
77	1847.40	3692.52	630	61	28	128	2.44	b
78	1872.88	3743.44	70	39	29	126	2.93	a
79	1936.25	3870.05	39	43	34	168	3.08	a

070887D02.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET020608.BKG (WEEKLY BKG 070608-2)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.58	631	150	116	618	151	117	
3	74.76	5286	242	159	5267	242	160	
5	77.04	10220	273	151	10198	274	152	
8	87.14	4247	230	155	4244	230	156	
10	94.61	520	264	214	469	265	215	
11	186.16	11993	275	137	11958	276	138	
17	295.22	25096	340	102	25086	341	103	
20	351.87	41400	426	103	41381	426	104	
31	510.73	466	148	117	274	151	121	
36	609.33	31676	366	70	31660	366	71	
49	964.33	174	67	51	168	68	52	
53	1120.36	6409	172	51	6406	172	52	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0718001-1 RA-226 VER 783.3020.77

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Sampling Start:   01/28/2005 10:00:00 | Counting Start:   06/13/2007 09:02:14
Sampling Stop:    01/28/2005 10:00:00 | Decay Time. . . . . 2.08e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 7200 Sec
Sample Size . . . . . 1.00e+000 L | Real Time . . . . . 7417 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 070887D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 2 (Detector 2)

Efficiency File: (D02) (Sh01).EFF (Geo 1 Eff Cal)

Eff=10[^][-2.48E+01 +2.17E+01*L +-5.07E+00*L[^]2 +0.00E+00*L[^]3] 05/07/2007

Eff.=10[^][-2.65E+00 +2.22E+00*L +-1.03E+00*L[^]2 +1.15E-01*L[^]3] Above 180.00 keV

Library File: . RA-226(186 KEV).LIB (Ra-226 std ver. (186 keV))

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/L)	MDA	Critical Level	Half-life (hrs)
Ra-226	186.21	4.42E+04 +- 1.02E+03	1.03E+03	5.11E+02	1.40E+07

MEASURED TOTAL: 4.42E+04 +- 1.02E+03 pCi/L

=====

UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.58	94.42	618	151	117	2980	0.65	1070DEsc
2	53.22	107.68	347	193	156	4468	0.93	Unknown
3	74.76	150.72	5267	242	160	5096	0.80	Unknown
4	75.21	151.62	309	354	290	10941	1.83	Unknown
5	77.04	155.27	10198	274	152	4593	0.80	Unknown
6	81.10	163.39	99	124	100	2483	0.42	Deleted
7	83.79	168.75	485	152	120	3173	0.68	Unknown
8	87.14	175.45	4244	230	156	4465	1.03	Unknown
9	89.80	180.78	1826	222	168	4833	1.08	Unknown
10	94.61	190.38	469	265	215	6326	1.59	Unknown
12	196.17	393.29	153	138	112	2781	0.62	Unknown
13	221.18	443.27	95	141	115	2666	0.79	Deleted
14	241.98	484.83	11240	260	123	2807	0.97	Unknown
15	258.86	518.56	694	149	115	2441	0.93	1281DEsc

=====
 UNKNOWN, SUM or ESCAPE PEAKS
 =====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
16	274.55	549.91	561	171	136	2909	1.31	Unknown
17	295.22	591.20	25086	341	103	1939	1.04	Unknown
18	314.52	629.77	59	73	59	847	0.53	Deleted
19	349.34	699.34	488	224	181	3626	2.22	Unknown
20	351.87	704.39	41381	426	104	1813	1.10	Unknown
21	386.82	774.23	300	120	95	1535	1.16	1408DEsc
22	388.89	778.37	387	134	105	1755	1.37	Unknown
23	405.67	811.89	139	148	120	2127	1.52	Unknown
24	428.53	857.57	64	72	58	833	0.60	Unknown
25	439.80	880.07	58	77	62	872	0.86	Deleted
26	454.83	910.11	233	93	73	1038	1.17	Unknown
27	461.70	923.83	193	110	88	1334	1.44	Unknown
28	474.64	949.69	37	60	48	569	0.62	Deleted
29	480.47	961.34	305	102	78	1138	1.27	Unknown
30	487.05	974.50	231	83	64	854	1.04	1509DEsc
31	510.73	1021.80	274	151	121	1748	2.38	Unknown
32	533.64	1067.57	143	79	62	761	1.11	Unknown
33	536.88	1074.05	112	86	69	870	1.35	Unknown
34	543.36	1087.01	104	94	76	995	1.48	Unknown
35	580.23	1160.66	216	79	60	716	1.12	Unknown
36	609.33	1218.80	31660	366	71	853	1.41	1120SEsc
37	665.59	1331.22	939	94	59	606	1.43	Unknown
38	683.30	1366.60	55	54	43	392	1.02	Unknown
39	703.22	1406.40	304	93	71	789	1.75	Unknown
40	719.89	1439.72	201	77	59	610	1.40	Unknown
41	742.13	1484.14	100	71	56	608	1.44	1765DEsc
42	768.49	1536.82	2715	128	61	679	1.58	1281SEsc
43	786.03	1571.87	626	84	56	608	1.47	Unknown
44	806.37	1612.50	696	84	54	566	1.52	Unknown
45	821.25	1642.23	96	48	36	322	0.86	Unknown
46	826.36	1652.45	63	58	46	451	1.08	1847DEsc
47	839.18	1678.06	337	81	59	650	1.69	Unknown
48	934.24	1867.99	1511	101	53	556	1.53	Unknown
49	964.33	1928.10	168	68	52	504	1.50	Unknown
50	1051.82	2102.93	79	63	50	458	1.68	Unknown
51	1070.09	2139.42	110	45	33	271	1.05	Unknown
52	1104.70	2208.59	51	52	41	370	1.39	Unknown
53	1120.36	2239.87	6406	172	52	486	1.98	Unknown
54	1133.46	2266.04	135	66	51	484	1.96	Unknown
55	1155.45	2309.98	673	81	52	490	1.88	Unknown
56	1182.55	2364.13	82	63	50	463	1.97	Unknown
57	1207.82	2414.61	185	57	41	342	1.70	Unknown
58	1238.27	2475.45	2480	114	45	379	2.01	Unknown
59	1253.60	2506.08	116	69	54	495	2.36	1765SEsc
60	1281.08	2560.99	493	69	44	365	1.78	Unknown
61	1303.64	2606.06	68	43	33	243	1.37	Unknown
62	1377.69	2754.01	1556	96	45	382	2.01	Unknown
63	1385.32	2769.27	231	57	40	318	1.56	Unknown
64	1401.68	2801.95	531	80	54	455	2.57	Unknown

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UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
65	1408.17	2814.93	853	81	46	369	2.15	Unknown
66	1509.29	3016.97	751	85	53	470	2.51	Unknown
67	1538.70	3075.74	118	58	44	359	1.95	Unknown
68	1543.81	3085.94	150	62	47	389	2.18	Unknown
69	1583.20	3164.65	180	61	45	361	2.05	Unknown
70	1594.86	3187.94	36	47	37	278	1.71	Deleted
71	1661.65	3321.38	329	57	36	226	2.25	Unknown
72	1684.20	3366.45	47	29	21	99	1.27	Unknown
73	1692.83	3383.68	62	40	30	161	2.16	Unknown
74	1729.65	3457.26	979	74	32	167	2.59	Unknown
75	1764.58	3527.04	5035	146	30	139	2.57	Unknown
76	1838.22	3674.18	88	37	26	119	2.36	Unknown
77	1847.40	3692.52	630	61	28	128	2.44	Unknown
78	1872.88	3743.44	70	39	29	126	2.93	Unknown
79	1936.25	3870.05	39	43	34	168	3.08	Unknown

c:\SEEKER\BIN\070887d02.res Analysis Results Saved.

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0718001-2 RA-226 VER 783.3020.77

 Sampling Start: 01/28/2005 10:00:00 | Counting Start: 06/13/2007 16:28:18
 Sampling Stop: 01/28/2005 10:00:00 | Decay Time. 2.08E+004 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 10800 Sec
 Sample Size 1.00E+000 L | Real Time 10872 Sec
 Collection Efficiency 1.0000 | Spc. File 070872D06.SPC

Detector #: 6 (Detector 6)

Energy(keV) = -0.65 + 0.501*Ch + -2.21E-10*Ch^2 + 0.00E+00*Ch^3 06/13/2007

FWHM(keV) = 1.19 + -0.002*En + 7.29E-04*En^2 + 0.00E+00*En^3 07/24/2006

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.43	94.04	407	193	155	5451	0.76	a
2	52.96	107.09	243	191	155	5451	0.83	b
3	74.77	150.65	6384	270	179	6765	0.98	a HiResid
4	76.34	153.78	353	169	135	4510	0.66	b HiResid
5	77.06	155.21	11240	286	157	5638	0.86	c HiResid
6	83.81	168.70	488	170	135	4510	0.62	d HiResid
7	87.12	175.32	5050	260	179	6765	1.05	e HiResid
8	89.79	180.64	1895	234	179	6765	0.93	f HiResid
9	186.20	373.21	15852	329	174	6372	0.97	a
10	195.84	392.45	261	205	167	5882	0.93	a
11	242.02	484.69	15279	297	136	3893	1.02	a
12	258.89	518.39	912	184	143	4034	1.10	a
13	274.74	550.05	619	175	138	3739	1.11	a
14	295.22	590.96	33822	400	130	3321	1.07	a
15	314.47	629.39	222	149	120	2826	1.12	a
16	333.36	667.14	145	275	225	6260	2.59	a NET< CL Wide Pk
17	349.47	699.31	837	302	244	6496	3.05	a Wide Pk
18	351.92	704.20	56013	492	110	2393	1.12	b
19	386.67	773.60	456	146	115	2439	1.34	a
20	388.92	778.10	547	135	104	2134	1.13	b
21	405.63	811.47	185	133	107	2267	1.06	a
22	454.81	909.71	422	123	95	1685	1.38	a
23	461.91	923.88	189	87	68	1053	0.90	b

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
24	469.86	939.75	113	84	67	1026	0.75	a
25	480.59	961.18	404	107	81	1301	1.10	a
26	487.12	974.23	506	118	90	1487	1.24	b
27	510.67	1021.27	686	172	135	2587	2.59	a Wide Pk
28	533.46	1066.78	240	98	77	1212	1.26	a
29	543.41	1086.65	75	78	62	896	1.04	a
30	580.07	1159.89	369	95	71	1038	1.38	a
31	609.28	1218.22	40591	412	71	1028	1.36	a
32	639.82	1279.22	70	90	73	989	1.65	a NET< CL
33	665.44	1330.39	1190	101	61	766	1.31	a
34	683.44	1366.34	77	68	54	640	1.22	a
35	703.10	1405.62	286	85	64	854	1.27	a
36	719.79	1438.94	274	75	55	657	1.18	a
37	742.11	1483.52	149	91	72	963	1.63	a
38	752.96	1505.20	65	61	48	532	0.91	a
39	768.40	1536.04	3655	144	64	796	1.45	a
40	785.95	1571.08	920	106	71	894	1.76	a
41	806.22	1611.58	837	92	59	720	1.35	a
42	821.16	1641.43	137	70	54	641	1.09	a
43	825.91	1650.90	97	100	81	1099	1.93	b
44	839.08	1677.21	439	89	64	801	1.49	a
45	904.34	1807.56	64	82	66	857	1.44	a NET< CL
46	934.14	1867.08	1997	116	61	733	1.52	a
47	964.06	1926.84	180	72	55	614	1.38	a
48	1052.09	2102.66	132	68	53	587	1.51	a
49	1070.01	2138.44	108	70	55	603	1.59	a
50	1104.72	2207.77	76	63	49	515	1.49	a
51	1120.28	2238.85	8179	192	53	565	1.71	a
52	1134.19	2266.64	106	58	45	443	1.34	a
53	1155.29	2308.78	917	94	59	637	1.93	a
54	1181.29	2360.71	31	126	103	1279	4.02	a NET< CL Wide Pk
55	1207.69	2413.44	244	74	55	562	1.90	a
56	1238.14	2474.26	3001	124	48	458	1.71	a
57	1253.71	2505.35	233	97	76	798	3.25	a Wide Pk
58	1281.13	2560.13	721	82	51	497	1.81	a
59	1303.40	2604.59	42	52	42	365	1.40	a
60	1377.68	2752.95	1998	107	49	437	1.90	a
61	1385.34	2768.27	372	68	46	401	1.73	b
62	1401.55	2800.63	553	72	45	410	1.63	a
63	1408.00	2813.52	1044	87	48	451	1.80	b
64	1460.63	2918.64	63	62	49	462	1.76	a
65	1509.21	3015.66	936	91	55	567	1.97	a
66	1538.56	3074.29	145	73	56	540	2.36	a
67	1543.31	3083.78	155	55	41	347	1.51	b
68	1583.19	3163.43	239	56	38	296	1.63	a
69	1594.59	3186.19	74	50	38	296	1.60	b
70	1599.36	3195.73	63	49	38	296	1.66	c
71	1661.20	3319.24	419	60	36	231	2.12	a

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
72	1683.86	3364.50	85	48	36	222	2.31	a
73	1693.20	3383.15	97	55	42	269	2.83	b
74	1729.53	3455.72	1364	82	29	147	2.27	a
75	1764.41	3525.38	6242	162	28	141	2.20	a
76	1838.21	3672.77	147	41	27	133	2.11	a
77	1847.31	3690.96	874	68	27	133	2.09	b
78	1873.01	3742.29	88	35	24	113	1.73	a
79	1896.34	3788.89	29	29	22	110	1.25	a

070872D06.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET060608.BKG (WEEKLY BKG 070608-6)

Bkg.File Detector #: 6

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
9	186.20	15852	329	174	15825	329	175	
14	295.22	33822	400	130	33808	401	131	
18	351.92	56013	492	110	56000	492	111	
27	510.67	686	172	135	444	177	141	
31	609.28	40591	412	71	40577	413	74	
64	1460.63	63	62	49	1	64	52	NET<CL
75	1764.41	6242	162	28	6236	162	29	

 SEEKER FINAL ACTIVITY REPORT Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0718001-2 RA-226 VER 783.3020.77

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Sampling Start: 01/28/2005 10:00:00 | Counting Start: 06/13/2007 16:28:18
Sampling Stop: 01/28/2005 10:00:00 | Decay Time. . . . . 2.08e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 10800 Sec
Sample Size . . . . . 1.00e+000 L | Real Time . . . . . 10872 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 070872D06.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 6 (Detector 6)

Efficiency File: (D06) (Sh01).eff (Geo 1 Eff Cal)

*Eff=10[^][-2.87E+01 +2.52E+01*L + -5.85E+00*L[^]2 +0.00E+00*L[^]3] 09/11/2006

Eff.=10[^][-1.40E+00 +1.00E+00*L + -6.55E-01*L[^]2 +7.72E-02*L[^]3] Above 180.00 keV

Library File: . RA-226(186 KEV).LIB (Ra-226 std ver. (186 keV))

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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/L)	MDA	Critical Level	Halflife (hrs)
Ra-226	186.21	4.32E+04 +- 9.00E+02	9.63E+02	4.78E+02	1.40E+07

MEASURED TOTAL: 4.32E+04 +- 9.00E+02 pCi/L

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UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.43	94.04	407	193	155	5451	0.76	1070DEsc
2	52.96	107.09	243	191	155	5451	0.83	Unknown
3	74.77	150.65	6384	270	179	6765	0.98	Unknown
4	76.34	153.78	353	169	135	4510	0.66	Unknown
5	77.06	155.21	11240	286	157	5638	0.86	Unknown
6	83.81	168.70	488	170	135	4510	0.62	Unknown
7	87.12	175.32	5050	260	179	6765	1.05	Unknown
8	89.79	180.64	1895	234	179	6765	0.93	Unknown
10	195.84	392.45	261	205	167	5882	0.93	Unknown
11	242.02	484.69	15279	297	136	3893	1.02	Unknown
12	258.89	518.39	912	184	143	4034	1.10	1281DEsc
13	274.74	550.05	619	175	138	3739	1.11	Unknown
14	295.22	590.96	33808	401	131	3321	1.07	Unknown
15	314.47	629.39	222	149	120	2826	1.12	Unknown

=====
 UNKNOWN, SUM or ESCAPE PEAKS
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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
16	333.36	667.14	145	275	225	6260	2.59	Deleted
17	349.47	699.31	837	302	244	6496	3.05	Unknown
18	351.92	704.20	56000	492	111	2393	1.12	Unknown
19	386.67	773.60	456	146	115	2439	1.34	1408DEsc
20	388.92	778.10	547	135	104	2134	1.13	Unknown
21	405.63	811.47	185	133	107	2267	1.06	Unknown
22	454.81	909.71	422	123	96	1685	1.38	Unknown
23	461.91	923.88	189	87	68	1053	0.90	Unknown
24	469.86	939.75	113	84	67	1026	0.75	Unknown
25	480.59	961.18	404	107	81	1301	1.10	Unknown
26	487.12	974.23	506	118	90	1487	1.24	1509DEsc
27	510.67	1021.27	444	177	141	2587	2.59	Unknown
28	533.46	1066.78	240	98	77	1212	1.26	Unknown
29	543.41	1086.65	75	78	62	896	1.04	Unknown
30	580.07	1159.89	369	95	71	1038	1.38	Unknown
31	609.28	1218.22	40577	413	74	1028	1.36	1120SEsc
32	639.82	1279.22	70	90	73	989	1.65	Deleted
33	665.44	1330.39	1190	101	61	766	1.31	Unknown
34	683.44	1366.34	77	68	54	640	1.22	Unknown
35	703.10	1405.62	286	85	64	854	1.27	Unknown
36	719.79	1438.94	274	75	55	657	1.18	Unknown
37	742.11	1483.52	149	91	72	963	1.63	1764DEsc
38	752.96	1505.20	65	61	48	532	0.91	Unknown
39	768.40	1536.04	3655	144	64	796	1.45	1281SEsc
40	785.95	1571.08	920	106	71	894	1.76	Unknown
41	806.22	1611.58	837	92	59	720	1.35	Unknown
42	821.16	1641.43	137	70	54	641	1.09	Unknown
43	825.91	1650.90	97	100	81	1099	1.93	1847DEsc
44	839.08	1677.21	439	89	64	801	1.49	Unknown
45	904.34	1807.56	64	82	66	857	1.44	Deleted
46	934.14	1867.08	1997	116	61	733	1.52	Unknown
47	964.06	1926.84	180	72	55	614	1.38	Unknown
48	1052.09	2102.66	132	68	53	587	1.51	Unknown
49	1070.01	2138.44	108	70	55	603	1.59	Unknown
50	1104.72	2207.77	76	63	49	515	1.49	Unknown
51	1120.28	2238.85	8179	192	53	565	1.71	Unknown
52	1134.19	2266.64	106	58	45	443	1.34	Unknown
53	1155.29	2308.78	917	94	59	637	1.93	Unknown
54	1181.29	2360.71	31	126	103	1279	4.02	Deleted
55	1207.69	2413.44	244	74	55	562	1.90	Unknown
56	1238.14	2474.26	3001	124	48	458	1.71	Unknown
57	1253.71	2505.35	233	97	76	798	3.25	1764SEsc
58	1281.13	2560.13	721	82	51	497	1.81	Unknown
59	1303.40	2604.59	42	52	42	365	1.40	Unknown
60	1377.68	2752.95	1998	107	49	437	1.90	Unknown
61	1385.34	2768.27	372	68	46	401	1.73	Unknown
62	1401.55	2800.63	553	72	45	410	1.63	Unknown
63	1408.00	2813.52	1044	87	48	451	1.80	Unknown
64	1460.63	2918.64	1	64	52	462	1.76	Deleted

070872D06.SPC Analyzed by

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UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
65	1509.21	3015.66	936	91	55	567	1.97	Unknown
66	1538.56	3074.29	145	73	56	540	2.36	Unknown
67	1543.31	3083.78	155	55	41	347	1.51	Unknown
68	1583.19	3163.43	239	56	38	296	1.63	Unknown
69	1594.59	3186.19	74	50	38	296	1.60	Unknown
70	1599.36	3195.73	63	49	38	296	1.66	Unknown
71	1661.20	3319.24	419	60	36	231	2.12	Unknown
72	1683.86	3364.50	85	48	36	222	2.31	Unknown
73	1693.20	3383.15	97	55	42	269	2.83	Unknown
74	1729.53	3455.72	1364	82	29	147	2.27	Unknown
75	1764.41	3525.38	6236	162	29	141	2.20	Unknown
76	1838.21	3672.77	147	41	27	133	2.11	Unknown
77	1847.31	3690.96	874	68	27	133	2.09	Unknown
78	1873.01	3742.29	88	35	24	113	1.73	Unknown
79	1896.34	3788.89	29	29	22	110	1.25	Unknown

c:\SEEKER\BIN\070872d06.res Analysis Results Saved.

070763D04.SPC Analyzed by *MR*

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0718001-3 RA-226 VER 783.3020.77

Sampling Start: 01/28/2005 10:00:00 | Counting Start: 06/15/2007 13:14:28
Sampling Stop: 01/28/2005 10:00:00 | Decay Time. 2.08E+004 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 7200 Sec
Sample Size 1.00E+000 L | Real Time 7258 Sec
Collection Efficiency 1.0000 | Spc. File 070763D04.SPC

Detector #: 4 (Detector 4)

Energy(keV) = -0.88 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 06/15/2007

FWHM(keV) = 0.61 + 0.012*En + 6.19E-04*En^2 + 0.00E+00*En^3 01/11/2007

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.53	94.73	479	129	100	2464	0.54	a
2	53.22	108.08	338	175	141	3996	0.81	a
3	74.88	151.36	6135	257	168	5691	0.82	a HiResid
4	77.06	155.72	10586	284	161	5200	0.74	b HiResid
5	79.35	160.30	264	134	107	2838	0.56	c HiResid
6	81.20	164.00	15	99	81	1837	0.38	d NET< CL HiResid
7	83.89	169.38	348	131	104	2641	0.53	e HiResid
8	87.17	175.92	4410	219	143	4117	0.86	f HiResid
9	89.88	181.35	1783	187	137	3781	0.86	g HiResid
10	92.48	186.53	79	139	114	2868	0.64	h NET< CL HiResid
11	94.96	191.49	128	138	112	2776	0.62	i HiResid
12	111.23	224.00	32	90	73	1493	0.40	a NET< CL
13	186.28	373.94	10638	262	133	3545	0.86	a
14	242.08	485.44	10498	252	120	2664	0.92	a
15	259.05	519.34	623	127	96	1858	0.81	a
16	274.13	549.47	293	162	130	2685	1.37	a
17	275.09	551.40	336	86	64	1007	0.50	b
18	295.31	591.80	22992	327	101	1878	0.96	a
19	314.57	630.28	60	86	69	1069	0.64	a NET< CL
20	333.25	667.59	54	127	104	1832	1.22	a NET< CL
21	351.96	704.99	37691	404	93	1597	1.02	a HiResid
22	386.96	774.92	171	93	74	1097	0.82	a

Page 001

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
23	389.04	779.08	305	108	84	1316	1.00	b
24	406.16	813.28	57	91	74	1107	0.80	a NET< CL
25	454.96	910.78	193	113	90	1209	1.45	a
26	461.76	924.37	129	74	58	678	0.87	a
27	469.72	940.28	97	72	57	652	0.75	a
28	474.11	949.05	53	80	65	782	0.99	b NET< CL
29	480.47	961.75	248	85	65	833	1.15	a
30	487.22	975.25	266	85	64	818	1.17	a
31	494.27	989.33	36	52	42	433	0.59	a NET< CL
32	509.65	1020.05	195	99	78	1010	1.65	a Wide Pk
33	511.48	1023.72	322	116	91	1212	1.90	b
34	533.81	1068.33	104	62	48	519	0.84	a
35	573.13	1146.90	79	95	77	974	1.56	a
36	580.32	1161.26	224	68	50	539	1.05	a
37	584.43	1169.47	64	77	62	718	1.27	b
38	609.41	1219.39	27360	340	66	805	1.30	a HiResid Wide Pk
39	616.85	1234.24	130	95	76	771	2.34	b HiResid
40	665.60	1331.65	744	84	53	515	1.36	a
41	703.17	1406.71	223	71	53	524	1.27	a
42	720.19	1440.72	143	68	53	511	1.29	a
43	741.55	1483.41	58	41	32	248	0.70	a
44	742.95	1486.21	54	65	52	496	1.31	b
45	752.52	1505.33	57	69	55	529	1.39	a
46	768.58	1537.42	2396	120	57	573	1.49	a
47	786.12	1572.45	622	84	55	505	1.63	a
48	806.40	1612.98	487	77	52	496	1.25	a
49	821.25	1642.65	104	64	50	468	1.27	a
50	826.40	1652.93	65	52	41	351	0.95	b
51	839.07	1678.25	276	74	54	513	1.47	a
52	934.24	1868.41	1255	97	54	539	1.57	a
53	964.19	1928.25	87	49	38	328	0.93	a
54	1052.20	2104.11	83	40	29	210	0.88	a
55	1070.06	2139.78	65	47	36	286	1.18	a
56	1084.09	2167.81	57	67	54	462	2.17	a
57	1120.45	2240.46	5315	158	50	432	1.76	a
58	1133.82	2267.18	45	42	33	250	1.06	a
59	1155.54	2310.58	636	77	48	388	1.96	a
60	1182.01	2363.47	75	47	36	264	1.23	a
61	1208.13	2415.66	131	59	44	347	1.73	a
62	1238.33	2476.01	1950	103	44	338	1.79	a
63	1253.62	2506.55	87	55	42	317	1.84	a
64	1281.29	2561.83	469	66	41	319	1.72	a
65	1304.25	2607.71	61	50	39	301	1.81	a
66	1377.85	2754.77	1289	88	42	322	2.01	a
67	1385.41	2769.87	216	59	42	322	1.90	b
68	1401.79	2802.61	436	67	44	336	2.15	a
69	1408.23	2815.47	669	72	41	310	2.03	b
70	1479.85	2958.57	56	63	50	415	2.43	a

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
71	1509.29	3017.39	546	72	45	367	2.00	a
72	1538.98	3076.70	105	47	34	251	1.53	a
73	1543.72	3086.19	94	61	48	391	2.24	b
74	1583.34	3165.35	164	49	34	226	1.84	a
75	1661.70	3321.92	264	45	26	127	1.81	a
76	1684.16	3366.78	40	31	23	106	1.85	a
77	1693.50	3385.45	61	35	25	115	2.07	a
78	1729.77	3457.92	859	67	26	121	2.18	a
79	1764.70	3527.71	3984	130	24	104	2.20	a HiResid
80	1838.62	3675.41	82	33	22	88	2.05	a
81	1847.52	3693.20	554	55	24	95	2.30	b
82	1873.44	3744.98	40	31	24	103	2.05	a
83	1896.03	3790.12	39	21	14	43	1.22	a
84	1936.73	3871.44	58	43	33	138	3.70	a Wide Pk

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070763D04.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET040608.BKG (WEEKLY BKG 070608-4)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.53	479	129	100	472	130	101	
2	53.22	338	175	141	332	176	141	
3	74.88	6135	257	168	6112	258	168	
4	77.06	10586	284	161	10565	284	161	
7	83.89	348	131	104	336	134	106	
8	87.17	4410	219	143	4400	219	144	
10	92.48	79	139	114	15	141	116	NET<CL
13	186.28	10638	262	133	10587	262	134	
16	274.13	293	162	130	290	162	130	
18	295.31	22992	327	101	22975	327	102	
21	351.96	37691	404	93	37681	405	94	
32	509.65	195	99	78	42	103	84	NET<CL
37	584.43	64	77	62	45	78	64	NET<CL
38	609.41	27360	340	66	27344	341	67	
53	964.19	87	49	38	82	50	38	

 SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0718001-3 RA-226 VER 783.3020.77

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Sampling Start: 01/28/2005 10:00:00 | Counting Start: 06/15/2007 13:14:28
Sampling Stop: 01/28/2005 10:00:00 | Decay Time. . . . . 2.08e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 7200 Sec
Sample Size . . . . . 1.00e+000 L | Real Time . . . . . 7258 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 070763D04.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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```

Detector #: 4 (Detector 4)

Efficiency File: (D04) (Sh01).EFF (Geo 1 Eff Cal)

Eff.=1/[9.03E-03*En^-3.44E+00 + 1.73E+02*En^8.64E-01] 01/12/2007

Library File: . RA-226(186 KEV).LIB (Ra-226 std ver. (186 keV))

=====

MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	Concentration (pCi/L)	MDA	Critical Level	Halflife (hrs)
Ra-226	186.21	4.81E+04 +- 1.19E+03	1.23E+03	6.08E+02	1.40E+07

MEASURED TOTAL: 4.81E+04 +- 1.19E+03 pCi/L

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.53	94.73	472	130	101	2464	0.54	Unknown
2	53.22	108.08	332	176	141	3996	0.81	Unknown
3	74.88	151.36	6112	258	168	5691	0.82	Unknown
4	77.06	155.72	10565	284	161	5200	0.74	Unknown
5	79.35	160.30	264	134	107	2838	0.56	Unknown
6	81.20	164.00	15	99	81	1837	0.38	Deleted
7	83.89	169.38	336	134	106	2641	0.53	Unknown
8	87.17	175.92	4400	219	144	4117	0.86	Unknown
9	89.88	181.35	1783	187	137	3781	0.86	Unknown
10	92.48	186.53	15	141	116	2868	0.64	Deleted
11	94.96	191.49	128	138	112	2776	0.62	Unknown
12	111.23	224.00	32	90	73	1493	0.40	Deleted
14	242.08	485.44	10498	252	120	2664	0.92	Unknown
15	259.05	519.34	623	127	96	1858	0.81	1281DEsc
16	274.13	549.47	290	162	130	2685	1.37	Unknown

=====
 UNKNOWN, SUM or ESCAPE PEAKS
 =====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
17	275.09	551.40	336	86	64	1007	0.50	Unknown
18	295.31	591.80	22975	327	102	1878	0.96	Unknown
19	314.57	630.28	60	86	69	1069	0.64	Deleted
20	333.25	667.59	54	127	104	1832	1.22	Deleted
21	351.96	704.99	37681	405	94	1597	1.02	Unknown
22	386.96	774.92	171	93	74	1097	0.82	1408DEsc
23	389.04	779.08	305	108	84	1316	1.00	Unknown
24	406.16	813.28	57	91	74	1107	0.80	Deleted
25	454.96	910.78	193	113	90	1209	1.45	Unknown
26	461.76	924.37	129	74	58	678	0.87	Unknown
27	469.72	940.28	97	72	57	652	0.75	Unknown
28	474.11	949.05	53	80	65	782	0.99	Deleted
29	480.47	961.75	248	85	65	833	1.15	Unknown
30	487.22	975.25	266	85	64	818	1.17	1509DEsc
31	494.27	989.33	36	52	42	433	0.59	Deleted
32	509.65	1020.05	42	103	84	1010	1.65	Deleted
33	511.48	1023.72	322	116	91	1212	1.90	Unknown
34	533.81	1068.33	104	62	48	519	0.84	Unknown
35	573.13	1146.90	79	95	77	974	1.56	Unknown
36	580.32	1161.26	224	68	51	539	1.05	Unknown
37	584.43	1169.47	45	78	64	718	1.27	Deleted
38	609.41	1219.39	27344	341	67	805	1.30	1120SEsc
39	616.85	1234.24	130	95	76	771	2.34	Unknown
40	665.60	1331.65	744	84	53	515	1.36	Unknown
41	703.17	1406.71	223	71	53	524	1.27	Unknown
42	720.19	1440.72	143	68	53	511	1.29	Unknown
43	741.55	1483.41	58	41	32	248	0.70	1765DEsc
44	742.95	1486.21	54	65	52	496	1.31	1765DEsc
45	752.52	1505.33	57	69	55	529	1.39	Unknown
46	768.58	1537.42	2396	120	57	573	1.49	1281SEsc
47	786.12	1572.45	622	84	55	505	1.63	Unknown
48	806.40	1612.98	487	77	52	496	1.25	Unknown
49	821.25	1642.65	104	65	50	468	1.27	Unknown
50	826.40	1652.93	65	52	41	351	0.95	1848DEsc
51	839.07	1678.25	276	74	54	513	1.47	Unknown
52	934.24	1868.41	1255	97	54	539	1.57	Unknown
53	964.19	1928.25	82	50	38	328	0.93	Unknown
54	1052.20	2104.11	83	40	29	210	0.88	Unknown
55	1070.06	2139.78	65	47	36	286	1.18	Unknown
56	1084.09	2167.81	57	67	54	462	2.17	Unknown
57	1120.45	2240.46	5315	158	50	432	1.76	Unknown
58	1133.82	2267.18	45	42	33	250	1.06	Unknown
59	1155.54	2310.58	636	77	48	388	1.96	Unknown
60	1182.01	2363.47	75	47	36	264	1.23	Unknown
61	1208.13	2415.66	131	59	44	347	1.73	Unknown
62	1238.33	2476.01	1950	103	44	338	1.79	Unknown
63	1253.62	2506.55	87	55	42	317	1.84	1765SEsc
64	1281.29	2561.83	469	66	41	319	1.72	Unknown
65	1304.25	2607.71	61	50	39	301	1.81	Unknown

=====

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
66	1377.85	2754.77	1289	88	42	322	2.01	Unknown
67	1385.41	2769.87	216	59	42	322	1.90	Unknown
68	1401.79	2802.61	436	67	44	336	2.15	Unknown
69	1408.23	2815.47	669	72	41	310	2.03	Unknown
70	1479.85	2958.57	56	63	50	415	2.43	Unknown
71	1509.29	3017.39	546	72	45	367	2.00	Unknown
72	1538.98	3076.70	105	47	34	251	1.53	Unknown
73	1543.72	3086.19	94	61	48	391	2.24	Unknown
74	1583.34	3165.35	164	49	34	226	1.84	Unknown
75	1661.70	3321.92	264	45	26	127	1.81	Unknown
76	1684.16	3366.78	40	31	23	106	1.85	Unknown
77	1693.50	3385.45	61	35	25	115	2.07	Unknown
78	1729.77	3457.92	859	67	26	121	2.18	Unknown
79	1764.70	3527.71	3984	130	24	104	2.20	Unknown
80	1838.62	3675.41	82	33	22	88	2.05	Unknown
81	1847.52	3693.20	554	55	24	95	2.30	Unknown
82	1873.44	3744.98	40	31	24	103	2.05	Unknown
83	1896.04	3790.12	39	21	14	43	1.22	Unknown
84	1936.73	3871.44	58	43	33	138	3.70	Unknown

c:\SEEKER\BIN\070763d04.res Analysis Results Saved.

Gamma Spectrometer Run Log

Date: 6/13/07Reviewed By/Date: JK 6/13/07

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
65070612-1 LGS	JK	1	13	30	9:02	JK	070855 d01.SPC	JK
0706050-5D	JK	4	↓	↓	↓	↓	070747 d04.SPC	JK
↓ - 10	JK	6	↓	↓	↓	↓	070866 d06.SPC	JK
65070612-2 LGS	JK	3	6	30	↓	↓	070766 d03.SPC	JK
0719001-1	JK	2	1	120	↓	↓	070857 d02.SPC	JK
0713011-4 (144)	JK	4	24	60	9:53	JK	070749 d04.SPC	JK
0713011-6 (435)	JK	6	↓	↓	↓	↓	070867 d06.SPC	JK
0706070-1	JK	1	97	60	11:04	JK	070856 d01.SPC	JK
-2	JK	3	↓	↓	↓	↓	070767 d03.SPC	JK
0706071-1	JK	4	↓	↓	↓	↓	070750 d04.SPC	JK
↓ - 2	JK	6	↓	↓	↓	↓	070865 d06.SPC	JK
0706071-3	JK	2	97	60	11:35	JK	070855 d02.SPC	JK
0706070-2D	JK	1	97	60	12:15	JK	070857 d01.SPC	JK
0706071-2D	JK	3	↓	↓	↓	↓	070765 d03.SPC	JK
↓ - 4	JK	4	↓	↓	↓	↓	070751 d04.SPC	JK
↓ - 5	JK	6	↓	↓	↓	↓	070869 d06.SPC	JK
65070613-3 MB	JK	2	97	60	12:46	JK	070859 d02.SPC	JK
65070613-3 LGS	JK	1	97	30	13:28	JK	070858 d01.SPC	JK
0706069-1	JK	3	7*	60	↓	↓	070769 d03.SPC	JK
↓ - 2	JK	4	↓	↓	↓	↓	070752 d04.SPC	JK
65070613-2 MB	JK	6	↓	↓	↓	↓	070870 d06.SPC	JK
0713001-8 (529)	JK	1	13	30	14:29	JK	070755 d05.SPC	JK
0706069-2D	JK	3	7*	60	14:35	JK	070770 d03.SPC	JK
65070613-2 LGS	JK	4	↓	30	↓	↓	070753 d04.SPC	JK

¹ Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

² Calibration geometry.

³ Count duration.

KEY:

* sample was counted on a puck

↑ sample was counted with air flow arrow pointing up

↓ sample was counted with air flow arrow pointing down

356744 B

Form 754r12b.doc (3/7/2007)

Gamma Spectrometer Run Log

Date: 6/15/07Reviewed By/Date: JAK 6/18/07

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
0706088-1	JAK	2	7*	60	10:49	JAK	070887D02.SPC	JAK
↓ -9	JAK	3	↓	↓	↓	↓	070780D03.SPC	JAK
↓ -17	JAK	4	↓	↓	↓	↓	070760D04.SPC	JAK
↓ -26	JAK	6	↓	↓	↓	↓	070879D06.SPC	JAK
0706088-9D	JAK	2	7*	60	12:09	JAK	070898D02.SPC	JAK
↓ -27	JAK	3	↓	↓	↓	↓	070781D03.SPC	JAK
↓ -28	JAK	4	↓	↓	↓	↓	070761D04.SPC	JAK
↓ -29	JAK	6	↓	↓	↓	↓	070880D06.SPC	JAK
65070615-1 MB	JAK	2	7*	60	13:14	JAK	070899D02.SPC	JAK
65070615-1 CB	JAK	3	↓	30	↓	↓	070782D03.SPC	JAK
0718001-3	JAK	4	↓	120	↓	↓	070763D04.SPC	JAK
070615-1	JAK	1	W8K6	1000	15:32	JAK	070887D01.SPC	JAK
↓ -2	JAK	2	↓	↓	↓	↓	070900D02.SPC	JAK
↓ -3	JAK	3	↓	↓	↓	↓	070783D03.SPC	JAK
↓ -4	JAK	4	↓	↓	↓	↓	070765D04.SPC	JAK
↓ -6	JAK	6	↓	↓	↓	↓	070881D06.SPC	JAK
↓ -8	JAK	8	↓	↓	↓	↓	070745D08.SPC	JAK
↓ -9	JAK	9	↓	↓	↓	↓	070899D09.SPC	JAK
JAK 6/15/07								

¹ Analyst will verify the position, detector, and geometry when the sample is removed from the detector.

² Calibration geometry.

³ Count duration.

KEY:

* sample was counted on a puck

↑ sample was counted with air flow arrow pointing up

↓ sample was counted with air flow arrow pointing down

356748B

Form 754r12b.doc (3/7/2007)

Paragon Analytics

315030 A

WORKSHEET FOR IN-HOUSE OR RUSH SAMPLES / Ra/Sr Lab

[illegible]

Isotope	No	Act / mL	Vol	P	Total Act (dpm)	Decay Corrected	Relinquished by / Date	Received by / Date
Spike 1	783.3220.774	103.84 dpm/mL	1 L		103840 dpm		1	
Spike 2								
Spike 3							2	
Spike 4								

WORKSHEET FOR IN-HOUSE OR RUSH SAMPLES / Ra/Sr Lab

315030 B

Matrix _____

Method (SOP / Rev) _____

Initials RLS Date 6/12/07

COMMENTS

226Ra Standard Verification

① 1 L of 783.3020.77 added to
Geo 1 Marinelli for analysis

Reviewed by / Date _____

CERTIFICATE OF CALIBRATION Standard Radionuclide Source

73487-307

RSO# 824 Rec'd 8/29/06
JUB

1.0 Solid in 138G GA-MA Beaker

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytisc maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

US Patent 4,430,258; UK Patent GB2,149,194B; CA Patent 1,196,776.
Density of solid matrix 1.15 g/cc.

Calibration date: July 1, 2006 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 Y	1323	3.0
Cd-109	88	462.6 d	1872	3.3
Co-57	122	271.79 d	984.9	3.0
Ce-139	166	137.6 d	1391	2.8
Hg-203	279	46.61 d	3088	2.7
Sn-113	392	115.1 d	1971	2.6
Cs-137	662	30.07 Y	1256	3.0
Y-88	898	106.6 d	4857	2.6
Co-60	1173	5.2714 Y	2377	2.7
Co-60	1332	5.2714 Y	2374	2.6
Y-88	1836	106.6 d	5084	2.6

P O NUMBER 71239, Rel. 7/31/06, Item 1

SOURCE PREPARED BY: M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: UM [Signature] 8-24-06

This standard will expire one year after the calibration date.

070691D02.SPC Analyzed by *1/2*

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0713002-2 GEO1 EFF CAL (824)

Sampling Start: 07/01/2006 10:00:00 Counting Start: 05/07/2007 12:25:18
Sampling Stop: 07/01/2006 10:00:00 Decay Time. 7.44E+003 Hrs
Buildup Time. 0.00E+000 Hrs Live Time 3600 Sec
Sample Size 1.00E+000 L Real Time 3747 Sec
Collection Efficiency 1.0000 Spc. File 070691D02.SPC

Detector #: 2 (Detector 2)

Energy(keV) = -0.50 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2007

FWHM(keV) = 0.69 + 0.005*En + 9.43E-04*En^2 + 0.00E+00*En^3 05/07/2007

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.58	120.02	28367	424	212	9076	0.80 a	
2	88.05	176.90	82181	638	229	10600	0.82 a	
3	122.15	245.01	44237	473	178	6394	0.85 a	
4	136.58	273.85	5676	250	164	5413	0.81 a	
5	165.93	332.48	29820	394	155	4864	0.88 a	
6	179.01	358.62	115	126	102	2574	0.46 a	
7	255.36	511.13	975	223	176	5280	1.22 a	
8	279.32	559.00	2350	203	147	3999	1.00 a	
9	391.88	783.86	18150	318	139	3294	1.17 a	
10	511.70	1023.23	364	175	140	3422	1.48 a	
11	536.98	1073.73	60	91	74	1333	0.65 a	NET< CL
12	661.94	1323.37	47490	462	126	2768	1.42 a	
13	814.45	1628.04	214	128	103	2171	1.37 a	
14	898.42	1795.79	19249	319	129	3075	1.70 a	
15	1173.66	2345.65	51039	466	92	1572	1.94 a	HiResid
16	1325.49	2648.96	448	111	84	982	3.32 a	HiResid
17	1332.89	2663.75	46166	436	60	638	2.12 b	HiResid
18	1836.48	3669.77	11168	215	32	165	2.54 a	HiResid

070691D02.SPC Analyzed by

 SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Background File: DET020505.BKG (WEEKLY BKG 070505-2)

Bkg.File Detector #: 2

=====

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	88.05	82181	638	229	82177	638	229	
8	279.32	2350	203	147	2346	204	147	
10	511.70	364	175	140	264	175	142	
11	536.98	60	91	74	58	91	74	NET<CL
14	898.42	19249	319	129	19247	319	129	

070691D02.SPC Analyzed by

SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0713002-2 GEO1 EFF CAL (824)
Stds. Match Tolerance: 2.00 keV

Detector Number: 02 Calibration Date. . . 05/07/2007 12:25:18
Geometry File (D02)(Sh01).EFF ID. Geo 1 Eff Cal
Amount of Std. in Calib. Source: 1.000000 gm

Crossover: 180.00 keV

Below Crossover Efficiency Fit:

$\text{Eff} = 10 \wedge [-2.48\text{e}+01 + 2.17\text{e}+01*\text{En} + -5.07\text{e}+00*\text{En}^2 + 0.00\text{e}+00*\text{En}^3]$
(Where En = LOG(Energy in keV)) (Polynomial)

Above Knee Efficiency Fit:

$\text{Eff} = 10 \wedge [-2.65\text{e}+00 + 2.22\text{e}+00*\text{En} + -1.03\text{e}+00*\text{En}^2 + 1.15\text{e}-01*\text{En}^3]$
(Where En = LOG(Energy in keV)) (Polynomial)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	5.96e-03	1.03	6.03e-03	0.02	6.03e-03
2	88.04	1.94e-02	-3.77	1.87e-02	-2.50	1.82e-02
3	122.06	2.75e-02	4.08	2.87e-02	-1.93	2.81e-02
4	165.85	2.84e-02	-1.52	2.80e-02	1.60	2.84e-02
5	279.00	2.12e-02	0.29	2.13e-02	-3.39	2.06e-02
6	391.68	1.66e-02	-0.69	1.64e-02	-3.58	1.59e-02
7	661.64	1.07e-02	0.32	1.07e-02	-2.42	1.05e-02
8	898.02	8.26e-03	0.79	8.33e-03	-1.12	8.23e-03
9	1173.21	6.67e-03	-0.20	6.66e-03	0.07	6.66e-03
10	1332.48	6.04e-03	-0.91	5.99e-03	0.58	6.02e-03
11	1836.01	4.58e-03	0.39	4.60e-03	1.48	4.67e-03

Calibration Results Saved.

OK

MC
5/18/07

Calibration verification

Geometry 1 Calibration Verification: Gamma Mixed Nuclide Source: Geometry 1													
Detector	2												
NEW SOURCE : 718													
FROM CALIBRATION CERTIFICATE													
Isotope	KeV	Half Life(Y)	Gamma/Sec.	Gamma Fraction:	Mass of Standard	EXPECTED ACTIVITY							
Am-241	59.9	432.0000	1304	0.3590	1	L	Am-241	DPS	pCi/L	Activity	Recovery	Pass/Fail	# of Half Lives Expired
Cd-109	88	1.2666	1862	0.0361			Cd-109	3632.3	98170.6	96100	98%	Pass	0.01
Co-57	122	0.7441	1032	0.8560			Co-57	51578.9	1394025.6	1390000	100%	Pass	3.04
Ce-139	166	0.3768	1419	0.8035			Ce-139	1205.6	32584.0	31500	97%	Pass	5.17
Hg-203	279	0.1276	3194	0.8146			Hg-203	1766.0	47730.4	NR	>5 h-lives	>5 h-lives	10.22
Sn-113	392	0.3151	1960	0.6490			Sn-113	3920.9	105971.4	NR	>5 h-lives	>5 h-lives	30.17
Cs-137	662	30.0000	1260	0.8521			Cs-137	3020.0	81622.5	40100	100%	Pass	12.22
Y-88	898	0.2919	5060	0.9340			Y-88	1478.7	39984.9	NR	>5 h-lives	>5 h-lives	0.13
Co-60	1173	5.2714	2402	0.9997			Co-60	5417.6	146420.5	65600	101%	Pass	13.19
Co-60	1332	5.2714	2427	0.9998			Co-60	2402.7	64938.4	65900	100%	Pass	0.73
Y-88	1836	0.2919	5287	0.9938			Y-88	2427.5	65607.7	NR	>5 h-lives	>5 h-lives	0.73
NR = NOT REPORTED													
R:\INSTGAMMA\CALIBRATION\IEFFIGEO1DEI72STD824.XLS													

OK
MC
5/18/07

070692D02.SPC Analyzed by *gla*

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0713002-2 GEO1 CAL VER (718)

Sampling Start: 07/01/2003 10:00:00 Counting Start: 05/07/2007 13:35:07
Sampling Stop: 07/01/2003 10:00:00 Decay Time. 3.37E+004 Hrs
Buildup Time. 0.00E+000 Hrs Live Time 3600 Sec
Sample Size 1.00E+000 L Real Time 3667 Sec
Collection Efficiency 1.0000 Spc. File 070692D02.SPC

Detector #: 2 (Detector 2)

Energy(keV) = -0.50 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/07/2007

FWHM(keV) = 0.69 + 0.005*En + 9.43E-04*En^2 + 0.00E+00*En^3 05/07/2007

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	57.88	116.63	2039	416	334	13003	2.14	a Wide Pk
2	59.58	120.03	27585	371	136	3727	0.79	b
3	88.02	176.85	15305	292	128	3298	0.76	a HiResid
4	116.82	234.38	100	98	79	1526	0.43	a
5	122.18	245.07	2824	176	115	2684	0.84	a
6	136.62	273.93	458	144	113	2584	0.87	a
7	181.64	363.87	165	153	124	2854	1.03	a
8	429.67	859.36	64	89	72	1271	0.60	a NET< CL
9	509.71	1019.26	79	76	60	901	0.64	a
10	661.96	1323.41	44759	437	91	1433	1.44	a
11	712.28	1423.94	26	88	72	1014	1.14	a NET< CL
12	1173.69	2345.71	35049	384	70	902	1.97	a
13	1332.92	2663.80	31677	358	35	215	2.10	a HiResid

070692D02.SPC Analyzed by

 SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Background File: DET020505.BKG (WEEKLY BKG 070505-2)

Bkg.File Detector #: 2

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
3	88.02	15305	292	128	15301	292	128	
9	509.71	79	76	60	-21	77	64	NET<CL

070692D02.SPC Analyzed by

 SEEKER FINAL ACTIVITY REPORT Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0713002-2 GEO1 CAL VER (718)

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Sampling Start: 07/01/2003 10:00:00 | Counting Start: 05/07/2007 13:35:07
Sampling Stop: 07/01/2003 10:00:00 | Decay Time. . . . . 3.37e+004 Hrs
Buildup Time. . . . . 0.00e+000 Hrs | Live Time . . . . . 3600 Sec
Sample Size . . . . . 1.00e+000 L | Real Time . . . . . 3667 Sec
Collection Efficiency . . . . . 1.0000 | Spectrum File . . . . . 070692D02.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %
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Detector #: 2 (Detector 2)

Efficiency File: (D02) (Sh01).EFF (Geo 1 Eff Cal)

Eff=10[^][-2.48E+01 +2.17E+01*L +-5.07E+00*L[^]2 +0.00E+00*L[^]3] 05/07/2007
 Eff.=10[^][-2.65E+00 +2.22E+00*L +-1.03E+00*L[^]2 +1.15E-01*L[^]3] Above 180.00 keV

Library File:ANALYTICAL.LIB (Analytical)

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/L)	MDA	Critical Level	Half-life (hrs)
Am-241	59.54	9.61E+04 +- 1.29E+03	9.57E+02	4.74E+02	3.79E+06
Cd-109	88.02	1.39E+06 +- 2.66E+04	2.35E+04	1.16E+04	1.11E+04
Co-57	122.07	3.15E+04 +- 1.96E+03	2.61E+03	1.29E+03	6.50E+03
Cs-137	661.62	4.01E+04 +- 3.92E+02	1.65E+02	8.13E+01	2.64E+05
Co-60	Average:x	6.58E+04 +- 5.18E+02	. . . . .	. . . . .	4.62E+04
	1173.21	6.56E+04 +- 7.19E+02	2.67E+02	1.31E+02	4.62E+04
	1332.48	6.59E+04 +- 7.46E+02	1.50E+02	7.24E+01	4.62E+04
Ce-139	165.85	MDA	1.00E+05	4.95E+04	3.30E+03
Hg-203	279.18	MDA	1.24E+11	6.13E+10	1.12E+03
Sn-113	391.68	MDA	7.69E+05	3.80E+05	2.76E+03
Y-88	898.02	MDA	1.86E+06	9.16E+05	2.56E+03

MEASURED TOTAL: 1.62E+06 +- 3.07E+04 pCi/L

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	57.88	116.63	2039	416	334	13003	2.14	Unknown
4	116.82	234.38	100	98	79	1526	0.43	Unknown
6	136.62	273.93	458	144	113	2584	0.87	Unknown
7	181.64	363.87	165	153	124	2854	1.03	Unknown

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070692D02.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
8	429.67	859.36	64	89	72	1271	0.60	Deleted
9	509.71	1019.26	-21	77	64	901	0.64	Deleted
11	712.28	1423.94	26	88	72	1014	1.14	Deleted

c:\SEEKER\BIN\070692d02.res Analysis Results Saved.

070017D04.SPC Analyzed by JP

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab.
GammaScan

Geo 1 / Water

Sample ID: 0713002-4 Geo 1 Eff Cal (824)

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Sampling Start: 07/01/2006 12:00:00 | Counting Start: 01/12/2007 10:25:53
Sampling Stop: 07/01/2006 12:00:00 | Decay Time. . . . . 4.68E+003 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 1800 Sec
Sample Size . . . . . 1.00E+000 L | Real Time . . . . . 1954 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 070017D04.SPC
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Detector #: 4 (Detector 4)

Energy(keV) = -1.08 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2007

FWHM(keV) = 0.61 + 0.012*En + 6.19E-04*En^2 + 0.00E+00*En^3 01/11/2007

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.52	121.04	14533	305	153	5210	0.72 a	HiResid
2	72.98	147.91	278	191	155	5331	0.72 a	
3	87.96	177.83	42859	458	161	5738	0.67 a	HiResid
4	122.10	246.01	26512	370	144	4187	0.81 a	
5	136.50	274.79	3360	195	129	3370	0.77 a	HiResid
6	165.86	333.41	22619	336	124	3078	0.81 a	HiResid
7	198.29	398.18	151	155	126	2944	0.91 a	
8	255.28	511.99	549	133	103	2118	0.79 a	
9	265.32	532.05	45	121	99	1962	0.87 a	NET< CL
10	279.20	559.77	5370	196	107	2109	1.00 a	
11	310.84	622.95	69	121	99	1809	0.98 a	NET< CL
12	391.73	784.52	14317	270	102	1787	1.07 a	
13	465.45	931.73	49	81	66	956	0.58 a	NET< CL
14	511.27	1023.25	271	156	125	2325	1.99 a	Wide Pk
15	624.50	1249.38	39	65	53	683	0.65 a	NET< CL
16	661.70	1323.67	18410	294	92	1571	1.33 a	
17	814.07	1627.99	356	122	95	1415	1.77 a	
18	898.08	1795.77	15272	268	86	1429	1.55 a	
19	1173.28	2345.38	19760	296	77	1038	1.73 a	HiResid
20	1326.16	2650.71	465	138	108	1116	5.61 a	HiResid Wide Pk
21	1332.46	2663.28	18286	276	43	361	1.87 b	HiResid
22	1835.91	3668.75	8825	190	25	115	2.18 a	HiResid

070017D04.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET040111.BKG (071111-4 Weekly Bkg)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
2	72.98	278	191	155	276	191	155	
3	87.96	42859	458	161	42856	458	161	
7	198.29	151	155	126	147	155	126	
14	511.27	271	156	125	233	156	126	

070017D04.SPC Analyzed by

SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0713002-4 Geo 1 Eff Cal (824)

Stds. Match Tolerance: 2.00 keV

Detector Number: 04 Calibration Date. . . 01/12/2007 10:25:53

Geometry File (D04)(Sh01).EFF ID. Geo 1 Eff Cal

Amount of Std. in Calib. Source: 1.000000 gm

Eff = 1 / [9.03e-03*En^-3.44e+00 + 1.73e+02*En^ 8.64e-01]

(Where En = Energy in MeV) (Exponential)

Pk. #	Energy (kev)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	6.11e-03	1.12	6.18e-03	17.32	7.47e-03
2	88.04	1.70e-02	-1.13	1.68e-02	18.55	2.07e-02
3	122.06	2.46e-02	0.38	2.47e-02	13.42	2.85e-02
4	165.85	2.41e-02	1.26	2.44e-02	9.86	2.71e-02
5	279.00	1.76e-02	-2.05	1.72e-02	10.29	1.92e-02
6	391.68	1.31e-02	-0.76	1.30e-02	12.14	1.47e-02
7	661.64	8.24e-03	0.19	8.26e-03	15.34	9.76e-03
8	898.02	6.20e-03	2.20	6.34e-03	17.20	7.66e-03
9	1173.21	4.95e-03	1.62	5.04e-03	18.79	6.20e-03
10	1332.48	4.59e-03	-1.76	4.51e-03	19.54	5.61e-03
11	1836.01	3.43e-03	-0.20	3.42e-03	21.41	4.35e-03

Calibration Results Saved.

Calibration verification

Geometry 01 Calibration Verification: Gamma Mixed Nuclide Source													
Std. #	718	Detector	4										
FROM CALIBRATION CERTIFICATE				REF DATE : 7/1/2003				count date				1/12/2007	
				FROM ANALYTICS.LIB				EXPECTED ACTIVITY					
Isotope	KeV	Half Life(Y)	Gammas/Sec.	Gamma Fraction:	Mass of Standard								# of half-lives expired
Am-241	59.9	432.0000	1304	0.3590	1	L	Am-241	DPS	pCi/L	Activity	Recovery	Pass/Fail	
Cd-109	88	1.2666	1862	0.0361			Cd-109	51578.9	1394025.6	1510000	104%	Pass	0.01
Co-57	122	0.7441	1032	0.8551			Co-57	1206.9	32618.3	31600	108%	Pass	2.79
Ce-139	166	0.3768	1419	0.8035			Ce-139	1766.0	47730.4	>5 h-lives	>5 h-lives	Pass	4.75
Hg-203	279	0.1276	3194	0.7730			Hg-203	4132.0	111674.4	>5 h-lives	>5 h-lives	Pass	9.38
Sn-113	392	0.3151	1960	0.6490			Sn-113	3020.0	81622.5	>5 h-lives	>5 h-lives	Pass	27.71
Cs-137	662	30.0000	1260	0.8512			Cs-137	1480.3	40007.1	40900	102%	Pass	11.22
Y-88	898	0.2919	5060	0.9340			Y-88	5417.6	146420.5	>5 h-lives	>5 h-lives	Pass	0.12
Co-60	1173	5.2714	2402	1.0000			Co-60	2402.0	64918.9	65500	101%	Pass	12.11
Co-60	1332	5.2714	2427	1.0000			Co-60	2427.0	65594.6	65200	99%	Pass	0.67
Y-88	1836	0.2919	5287	0.9938			Y-88	5320.0	143783.3	>5 h-lives	>5 h-lives	Pass	12.11

R:\inst\gammaammals718.xls

070018D04.SPC Analyzed by JP

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0713002-4A Geo 1 Cal Ver (718)

Sampling Start: 07/01/2003 12:00:00 | Counting Start: 01/12/2007 11:03:22
Sampling Stop: 07/01/2003 12:00:00 | Decay Time. 3.10E+004 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 1800 Sec
Sample Size 1.00E+000 L | Real Time 1822 Sec
Collection Efficiency 1.0000 | Spc. File 070018D04.SPC

Detector #: 4 (Detector 4)

Energy(keV) = -1.08 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 01/12/2007

FWHM(keV) = 0.61 + 0.012*En + 6.19E-04*En^2 + 0.00E+00*En^3 01/11/2007

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	49.94	101.90	252	162	130	3420	0.85 a	
2	59.51	121.01	15038	281	112	2551	0.74 a	HiResid
3	87.95	177.81	8875	209	74	1228	0.71 a	HiResid
4	98.84	199.55	84	120	97	1614	1.13 a	NET< CL
5	122.11	246.05	1633	115	67	992	0.73 a	
6	136.51	274.80	279	123	97	1603	1.09 a	
7	165.76	333.22	78	90	73	1063	0.83 a	
8	170.49	342.66	70	64	51	638	0.45 b	
9	175.12	351.90	54	77	62	851	0.66 c	NET< CL
10	185.65	372.94	62	105	86	1360	0.90 a	NET< CL
11	235.25	472.00	20	64	52	678	0.47 a	NET< CL
12	322.12	645.50	29	54	43	461	0.54 a	NET< CL
13	490.86	982.50	40	53	42	435	0.60 a	NET< CL
14	581.35	1163.21	44	50	40	358	0.85 a	
15	661.67	1323.63	17666	275	58	625	1.31 a	HiResid
16	995.47	1990.26	94	83	66	769	1.75 a	
17	1173.25	2345.33	13795	242	47	384	1.75 a	HiResid
18	1332.42	2663.22	12303	224	24	113	1.85 a	HiResid

070018D04.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET040111.BKG (071111-4 Weekly Bkg)

Bkg.File Detector #: 4

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
3	87.95	8875	209	74	8872	209	75	
10	185.65	62	105	86	50	106	86	NET<CL

070018D04.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0713002-4A Geo 1 Cal Ver (718)

Sampling Start: 07/01/2003 12:00:00 Counting Start: 01/12/2007 11:03:22
Sampling Stop: 07/01/2003 12:00:00 Decay Time. 3.10e+004 Hrs
Buildup Time. 0.00e+000 Hrs Live Time 1800 Sec
Sample Size 1.00e+000 L Real Time 1822 Sec
Collection Efficiency 1.0000 Spectrum File 070018D04.SPC
Cr. Level Confidence Interval: 95 % Det. Limit Confidence Interval: 95 %

Detector #: 4 (Detector 4)

Efficiency File: (D04) (Sh01).EFF (Geo 1 Eff Cal)

Eff.=1/[9.03E-03*En³-3.44E+00 + 1.73E+02*En⁸.64E-01] 01/12/2007

Library File:ANALYTICAL.LIB (Analytical)
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MEASURED or MDA CONCENTRATIONS

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Nuclide	ENERGY E (keV)	N T	Concentration (pCi/L)	MDA	Critical Level	Half-life (hrs)
Am-241	59.54		1.02E+05 +- 1.91E+03	1.55E+03	7.64E+02	3.79E+06
Cd-109	88.02		1.51E+06 +- 3.55E+04	2.58E+04	1.27E+04	1.11E+04
Co-57	122.07		3.15E+04 +- 2.21E+03	2.64E+03	1.29E+03	6.50E+03
Cs-137	661.62		4.09E+04 +- 6.37E+02	2.75E+02	1.35E+02	2.64E+05
Co-60	Average:x		6.53E+04 +- 8.24E+02	. . . .	. . . .	4.62E+04
	1173.21		6.55E+04 +- 1.15E+03	4.56E+02	2.22E+02	4.62E+04
	1332.48		6.52E+04 +- 1.19E+03	2.71E+02	1.28E+02	4.62E+04
Ce-139	165.85		MDA	5.27E+04r	2.57E+04	3.30E+03
Hg-203	279.18		MDA	3.61E+10	1.77E+10	1.12E+03
Sn-113	391.68		MDA	6.45E+05	3.17E+05	2.76E+03
Y-88	898.02		MDA	1.45E+06	7.11E+05	2.56E+03

MEASURED TOTAL: 1.75E+06 +- 4.11E+04 pCi/L

UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	49.94	101.90	252	162	130	3420	0.85	Unknown
4	98.84	199.55	84	120	97	1614	1.13	Deleted
6	136.51	274.80	279	123	97	1603	1.09	Unknown
7	165.76	333.22	78	90	73	1063	0.83	Unknown
8	170.49	342.66	70	64	51	638	0.45	Unknown

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070018D04.SPC Analyzed by

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UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
9	175.12	351.90	54	77	62	851	0.66	Deleted
10	185.65	372.94	50	106	86	1360	0.90	Deleted
11	235.25	472.00	20	64	52	678	0.47	Deleted
12	322.12	645.50	29	54	43	461	0.54	Deleted
13	490.86	982.50	40	53	42	435	0.60	Deleted
14	581.35	1163.21	44	50	40	358	0.85	Unknown
16	995.47	1990.26	94	83	66	769	1.75	Unknown

062299D06.SPC Analyzed by *CW*

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0613004-6 GEO 1 EFF CAL (824)

Sampling Start: 07/01/2006 12:00:00 | Counting Start: 09/11/2006 10:06:11
Sampling Stop: 07/01/2006 12:00:00 | Decay Time. 1.73E+003 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 3600 Sec
Sample Size 1.00E+000 L | Real Time 3816 Sec
Collection Efficiency 1.0000 | Spc. File 062299D06.SPC

Detector #: 6 (Detector 6)

Energy(keV) = -0.69 + 0.501*Ch + -1.21E-08*Ch^2 + 0.00E+00*Ch^3 09/11/2006

FWHM(keV) = 1.19 + -0.002*En + 7.29E-04*En^2 + 0.00E+00*En^3 07/24/2006

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.52	120.20	17321	432	282	16764	0.97	a
2	68.57	138.27	869	573	469	34236	1.81	a
3	70.84	142.82	2134	456	367	24899	1.33	b
4	72.87	146.86	2689	335	262	15562	0.90	c
5	82.43	165.95	3002	571	461	33017	1.82	a Wide Pk
6	85.57	172.22	9260	1014	819	66033	3.56	b
7	88.01	177.10	89635	696	292	18009	1.00	c
8	122.08	245.12	67543	624	284	17005	1.04	a
9	136.50	273.92	9248	419	306	18487	1.07	a
10	165.87	332.56	85526	661	253	13482	1.04	a HiResid
								Wide Pk
11	169.73	340.25	7	895	736	51681	3.84	b NET< CL
								HiResid
12	255.20	510.90	3206	298	227	10112	1.21	a
13	279.25	558.93	70487	588	208	8536	1.18	a
14	291.15	582.70	135	161	131	4242	0.68	a
15	391.79	783.63	64255	552	181	6023	1.27	a HiResid
16	486.62	972.99	90	162	132	3675	0.94	a NET< CL
17	511.23	1022.12	1613	274	216	7476	2.15	a
18	661.70	1322.56	40791	452	167	5398	1.50	a
19	814.06	1626.80	1148	160	120	2938	1.38	a
20	898.14	1794.69	74717	574	144	3827	1.67	a HiResid
21	1173.29	2344.11	46124	448	106	2151	1.85	a
22	1325.16	2647.37	1580	178	131	2472	3.03	a

Page 001

062299D06.SPC Analyzed by

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
23	1332.56	2662.15	41933	425	92	1561	1.98	b
24	1835.95	3667.36	43750	422	46	363	2.29	a HiResid

062299D06.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Version 1.8.2

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET060908.BKG (060908-6 WEEKLY BKGD)

Bkg.File Detector #: 6

=====

BACKGROUND SUBTRACT RESULTS

=====

PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
17	511.23	1613	274	216	1535	275	216	

062299D06.SPC Analyzed by

SEEKER CALIBRATION RESULTS Version 2.0.4

Sample ID: 0613004-6 GEO 1 EFF CAL (824)

Stds. Match Tolerance: 2.00 keV

Detector Number: 06 Calibration Date: . . 09/11/2006 10:06:11

Geometry File (D06) (Sh01).EFF ID. Geo 1 Eff Cal

Amount of Std. in Calib. Source: 1.000000 gm

Crossover: 180.00 keV

Below Crossover Efficiency Fit:

Eff = $10^{[-2.87e+01 + 2.52e+01*En + -5.85e+00*En^2 + 0.00e+00*En^3]}$

(Where En = LOG(Energy in keV)) (Polynomial)

Above Knee Efficiency Fit:

Eff = $10^{[-1.40e+00 + 1.00e+00*En + -6.55e-01*En^2 + 7.72e-02*En^3]}$

(Where En = LOG(Energy in keV)) (Polynomial)

Pk. #	Energy (keV)	Measured Efficiency	% Difference	Calculated Efficiency	% Difference	Prev.Calc. Efficiency
1	59.50	3.64e-03	1.22	3.68e-03	-0.85	3.65e-03
2	88.04	1.48e-02	-4.48	1.42e-02	1.50	1.44e-02
3	122.06	2.29e-02	4.81	2.40e-02	2.25	2.46e-02
4	165.85	2.45e-02	-1.80	2.41e-02	1.96	2.46e-02
5	279.00	1.85e-02	0.02	1.85e-02	1.23	1.87e-02
6	391.68	1.40e-02	0.07	1.40e-02	1.78	1.42e-02
7	661.64	9.06e-03	-0.92	8.98e-03	1.35	9.10e-03
8	898.02	6.82e-03	1.55	6.93e-03	1.11	7.01e-03
9	1173.21	5.53e-03	0.06	5.53e-03	1.33	5.61e-03
10	1332.48	5.04e-03	-1.14	4.98e-03	1.66	5.06e-03
11	1836.01	3.82e-03	0.34	3.83e-03	3.40	3.97e-03

Calibration Results Saved.

OK
9/11/06

Callbrallon verification

[illegible]

062302D06.SPC Analyzed by *CW*

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0613004-6A GEO 1 CAL VER (798)

Sampling Start: 07/01/2005 12:00:00 | Counting Start: 09/11/2006 11:24:12
Sampling Stop: 07/01/2005 12:00:00 | Decay Time. 1.05E+004 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 5400 Sec
Sample Size 1.00E+000 L | Real Time 5543 Sec
Collection Efficiency 1.0000 | Spc. File 062302D06.SPC

Detector #: 6 (Detector 6)

Energy(keV)= -0.69 + 0.501*Ch + -1.21E-08*Ch^2 + 0.00E+00*Ch^3 09/11/2006

FWHM(keV) = 1.19 + -0.002*En + 7.29E-04*En^2 + 0.00E+00*En^3 07/24/2006

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000.

=====

PEAK SEARCH RESULTS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.48	120.14	25644	420	224	10565	0.93 a	HiResid
2	86.98	175.03	3233	643	521	33393	2.65 a	Wide Pk
3	88.01	177.10	79514	632	236	11715	1.03 b	
4	122.07	245.11	43091	497	224	9901	1.08 a	
5	136.45	273.81	5438	271	187	7422	1.00 a	
6	165.85	332.52	20801	379	202	8020	1.08 a	
7	255.21	510.93	358	180	145	4784	0.82 a	
8	279.26	558.95	327	168	135	4143	0.77 a	
9	391.77	783.60	11517	287	157	4568	1.31 a	
10	432.05	864.01	65	158	129	3513	1.00 a	NET< CL
11	510.34	1020.35	452	205	165	4781	1.82 a	
12	512.17	1024.00	224	133	106	2608	1.05 b	
13	611.66	1222.65	131	130	105	2407	1.22 a	
14	661.68	1322.53	60926	518	128	3184	1.50 a	
15	813.20	1625.08	362	282	230	6496	3.23 a	Wide Pk
16	815.26	1629.18	-99	97	81	1624	0.86 b	NET< CL
17	836.24	1671.08	248	176	143	3578	1.88 a	
18	898.13	1794.65	11035	274	145	3901	1.63 a	
19	1173.29	2344.11	64793	522	94	1687	1.87 a	HiResid
20	1324.43	2645.91	169	88	69	780	2.54 a	
21	1332.56	2662.14	57861	487	64	749	1.96 a	
22	1460.94	2918.51	46	52	41	325	1.76 a	
23	1835.94	3667.35	6407	163	25	111	2.29 a	

062302D06.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET060908.BKG (060908-6 WEEKLY BKGD)

Bkg.File Detector #: 6

=====

BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
11	510.34	452	205	165	336	206	167	
22	1460.94	46	52	41	21	52	42	NET<CL

062302D06.SPC Analyzed by

SEEKER F I N A L A C T I V I T Y R E P O R T Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0613004-6A GEO 1 CAL VER (798)

Sampling Start: 07/01/2005 12:00:00 Counting Start: 09/11/2006 11:24:12
Sampling Stop: 07/01/2005 12:00:00 Decay Time. 1.05e+004 Hrs
Buildup Time. 0.00e+000 Hrs Live Time 5400 Sec
Sample Size 1.00e+000 L Real Time 5543 Sec
Collection Efficiency 1.0000 Spectrum File 062302D06.SPC
Cr. Level Confidence Interval: 95 % Det. Limit Confidence Interval: 95 %

Detector #: 6 (Detector 6)

Efficiency File: (D06) (Sh01).EFF (Geo 1 Eff Cal)

Eff=10^{-2.87E+01 +2.52E+01*L +-5.85E+00*L² +0.00E+00*L³} 09/11/2006
Eff.=10^{-1.40E+00 +1.00E+00*L +-6.55E-01*L² +7.72E-02*L³} Above 180.00 keV

Library File:ANALYTICAL.LIB (Analytical)

=====

MEASURED or MDA CONCENTRATIONS

=====

Nuclide	ENERGY E (keV)	N T	Concentration (pCi/L)	MDA	Critical Level	Halflife (hrs)
Am-241	59.54	9.70E+04 +- 1.59E+03	1.70E+03	8.46E+02	3.79E+06	
Cd-109	88.02	1.49E+06 +- 1.19E+04	8.90E+03	4.43E+03	1.11E+04	
Co-57	122.07	3.20E+04 +- 3.69E+02	3.35E+02	1.67E+02	6.50E+03	
Ce-139	165.85	4.85E+04 +- 8.83E+02	9.47E+02	4.70E+02	3.30E+03	
Sn-113	391.68	8.82E+04 +- 2.20E+03	2.43E+03	1.20E+03	2.76E+03	
Cs-137	661.62	4.10E+04 +- 3.48E+02	1.74E+02	8.60E+01	2.64E+05	
Y-88	Average:x	1.45E+05 +- 2.58E+03	. . . . .	. . . . .	2.56E+03
	898.02	1.46E+05 +- 3.64E+03	3.89E+03	1.92E+03	2.56E+03	
	1836.01	1.44E+05 +- 3.67E+03	1.21E+03	5.74E+02	2.56E+03	
Co-60	Average:x	6.84E+04 +- 3.98E+02	. . . . .	. . . . .	4.62E+04
	1173.21	6.86E+04 +- 5.52E+02	2.01E+02	9.90E+01	4.62E+04	
	1332.48	6.81E+04 +- 5.73E+02	1.53E+02	7.49E+01	4.62E+04	
Hg-203	279.18	MDA	5.19E+04r	2.57E+04	1.12E+03	

MEASURED TOTAL: 2.01E+06 +- 2.03E+04 pCi/L

=====

UNKNOWN, SUM or ESCAPE PEAKS

=====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
2	86.98	175.03	3233	643	521	33393	2.65	Unknown
5	136.45	273.81	5439	271	187	7422	1.00	Unknown

Page 003

062302D06.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
7	255.21	510.93	358	180	145	4784	0.82	Unknown
8	279.26	558.95	328	168	135	4143	0.77	Unknown
10	432.05	864.01	65	158	129	3513	1.00	Deleted
11	510.34	1020.35	336	206	167	4781	1.82	Unknown
12	512.17	1024.00	224	133	106	2608	1.05	Unknown
13	611.66	1222.65	131	130	105	2407	1.22	Unknown
15	813.20	1625.08	362	282	230	6496	3.23	1836DEsc
16	815.26	1629.18	-99	97	81	1624	0.86	Deleted
17	836.24	1671.08	248	176	143	3578	1.88	Unknown
20	1324.43	2645.91	169	88	69	780	2.54	1836SEsc
22	1460.94	2918.51	21	52	42	325	1.76	Deleted

c:\SEEKER\BIN\062302d06.res Analysis Results Saved.

Paragon Analytics

Gamma Spectrometer Calibration Log

Date: 6/13/07

Reviewed By/Date: JAS 6/14/07

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.				JAS	/	1332 Cent	JAS		Gain Adj.	
2.				JAS	JAS					
3.				JAS	/	1332 ECP	JAS			
4.				JAS	JAS					
5.	JAS			/	/					
6.				JAS	JAS					
7.	JAS			/	/					
8.		JAS	JAS	JAS	JAS		JAS			
9.				JAS	JAS					
10.	JAS			/	/					

** Corrective Action:

- New amp installed. Interium control limits set.
JAS 6/13/07

356744 A

Form 754r12a.doc (3/7/2007)

CPY000

Paragon Analytics

Gamma Spectrometer Calibration Log

Date: 6/14/07

Reviewed By/Date: gmk 6/15/07

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.				gmk	gmk					
2.				gmk	gmk					
3.				gmk	/	1332 LPE	gmk			
4.				gmk	gmk					
5.	gmk			/	/					
6.				gmk	gmk					
7.	gmk			/	/					
8.				gmk	gmk					
9.		gmk	gmk	gmk	/		gmk			
10.	gmk			/	/					

** Corrective Action:

- Amp displaying gain stability issues. Amp replaced.

gmk 6/14/07

Δ New amp installed. Intercom control limits set.

gmk 6/14/07

356747 A

Form 754r12a.doc (3/7/2007)

356747

Paragon Analytics

Gamma Spectrometer Calibration Log

Date: 6/15/07

Reviewed By/Date: JLK 6/15/07

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.		JLK	80	JLK	JLK					
2.		JLK	80	JLK	JLK					
3.		JLK	80	JLK	JLK					
4.		JLK	80	JLK	JLK					
5.	JLK	/	/	/	/					
6.		JLK	80	JLK	JLK					
7.	JLK	/	/	/	/					
8.		JLK	80	JLK	JLK					
9.		JLK	80	JLK	JLK					
10.	JLK	/	/	/	/					

** Corrective Action:

* Peak fit error @ 75 - 87, 134 keV.

Detector cleaned and background rerun.

JLK 6/15/07

356748 A

Form 754r12a.doc (3/7/2007)

356748

Paragon Analytics

Gamma Spectrometer Calibration Log

Date: 12/10/07

Reviewed By/Date: JAL 6/15/10

Det. No.	Out Of Service	Background		Source Check			Repeat Source Check			
		Started	OK	Started	OK	Failed Parameter(s)	OK	Failed Parameter(s)	Corrective Action Taken **	Removed from Service
1.				Y	Y					
2.				Y	Y					
3.				Y	Y					
4.				Y	Y					
5.	Y			/	/					
6.				Y	Y					
7.	Y			/	/					
8.				Y	Y					
9.				Y		1332 keV centroid		1332 keV centroid		Y
10.	Y			/	/					

** Corrective Action:

356749 A

Form 754r12a.doc (3/7/2007)

247022

Radiochemistry Solution Report

Solution ID: 783.3020.77	Name: Ra-226	Lot:	Vendor Name:	Type: IS
--------------------------	--------------	------	--------------	----------

Final Vol: 1024.2	Dept: RD	Prep By: ALB	on 3/9/07	Reviewed By: dcb	on 10/5/07
Units: g	Location: RADSTD	Opened By:	on	Verified By:	on
Matrix: LIQUID	Expire Date: 6/15/08	Received By:	on	Deactivated By:	on

Comment:

Component Name	Component ID	Volume Added	Units
Ra-226	783.2613.72	3.8232	g

Calibrated Primary Calibration Reference

CompName	Act/Conc	Date	Date	1/2 Life (Yrs)	Final Act/Conc	Summed Conc	Units
Ra-222	101056.9	1/28/05	10/5/07	1600 (Pmt)	46.721524757156		pCi/g
Ra-226	101056.9	1/28/05	10/5/07	1600	46.721524757156		pCi/g

Associated Parent IDs

783	783.2613.72
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Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
NE = Not Entered

(Pmt) = Secular equilibrium; parent half life used to calculate concentration.

Date Printed: Friday, October 05, 2007

Paragon Analytics

A Division of Datachem Laboratories

Standards DB Version: 1.081

Page 1 of 1

ICV's

11/21/09 178 of 203

QUALITY ASSURANCE SUMMARY SHEET

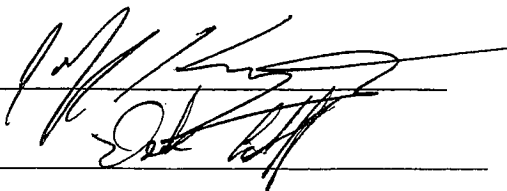
PAR W.O. # / BATCH REM Calibration
TEST REM
METHOD Analysis
SOP/REV (PREP) —
SOP/REV (ANAL) 78328

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

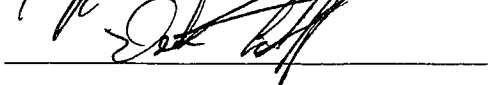
- 92K 2/11/09*
- The radiometric recoveries of the initial calibration verifications for cells 10, 12, and 28 were below the lower control limit of 67%. It was noted that there was an elevated background for these cells and it is believed that this is due to an incomplete purge of the cell after the previous calibration count. The cells were re-purged and the ICV's were re-run. The second analysis is to be used as the initial calibration verification for these cells. *92K 2/11/09*

92K 2/11/09

TECHNICIAN/ANALYST

DATE 2/11/09

DEPARTMENT MANAGER

DATE 2/11/09

369112

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: LJF

Prep. Date S: 5/7/2008

Prep. Date C: 1/18/2009

SOP Used: 783R8

W.O.#	S	V	S	Purge (end)		Flask No.	Counter No.	Scaler No.	CBKG #	Deeman. (end)		Count Start		Count Duration (min.)	COUNT #	REMARKS
				Date	Time					Date	Time	Date	Time			
08-16-503	ICV1	1	1	5/7/2008	12:00	1	E	3	12	1/18/2009	13:16	1/18/2009	17:28	15	363	
08-16-503	ICV2	1	1	5/7/2008	12:00	2	E	3	18	1/18/2009	13:16	1/18/2009	17:44	15	773	
08-16-503	ICV3	1	1	5/7/2008	12:00	20	C	6	36	1/18/2009	13:16	1/18/2009	17:28	15	1246	
08-16-503	ICV4	1	1	5/7/2008	12:00	21	C	6	53	1/18/2009	13:16	1/18/2009	17:44	15	1130	
08-16-503	ICV5	1	1	5/7/2008	12:00	41	F	1	44	1/18/2009	13:16	1/18/2009	17:28	15	875	
08-16-503	ICV6	1	1	5/7/2008	12:00	42	F	1	60	1/18/2009	13:16	1/18/2009	17:44	15	1504	
08-16-503	ICV7	1	1	5/7/2008	12:00	3	E	3	15	1/18/2009	13:48	1/18/2009	18:01	15	804	
08-16-503	ICV8	1	1	5/7/2008	12:00	4	E	3	18	1/18/2009	13:48	1/18/2009	18:18	15	382	
08-16-503	ICV9	1	1	5/7/2008	12:00	22	C	6	57	1/18/2009	13:48	1/18/2009	18:01	15	1518	
08-16-503	ICV10	1	1	5/7/2008	12:00	23	C	6	76	1/18/2009	13:48	1/18/2009	18:18	15	1516	
08-16-503	ICV11	1	1	5/7/2008	12:00	43	F	1	16	1/18/2009	13:48	1/18/2009	18:01	15	1513	
08-16-503	ICV12	1	1	5/7/2008	12:00	44	F	1	25	1/18/2009	13:48	1/18/2009	18:18	15	1360	
08-16-503	ICV13	1	1	5/7/2008	12:00	6	E	3	11	1/18/2009	14:18	1/18/2009	18:40	15	857	
08-16-503	ICV14	1	1	5/7/2008	12:00	8	E	3	18	1/18/2009	14:18	1/18/2009	18:59	15	880	
08-16-503	ICV15	1	1	5/7/2008	12:00	24	C	6	54	1/18/2009	14:18	1/18/2009	18:40	15	2732	
08-16-503	ICV16	1	1	5/7/2008	12:00	25	C	6	96	1/18/2009	14:18	1/18/2009	18:59	15	2282	
08-16-503	ICV17	1	1	5/7/2008	12:00	45	F	1	48	1/18/2009	14:18	1/18/2009	18:40	15	1324	
08-16-503	ICV18	1	1	5/7/2008	12:00	46	F	1	34	1/18/2009	14:18	1/18/2009	18:59	15	1638	
08-16-503	ICV19	1	1	5/7/2008	12:00	9	E	3	13	1/18/2009	14:43	1/18/2009	19:16	15	1345	
08-16-503	ICV20	1	1	5/7/2008	12:00	10	E	3	410	1/18/2009	14:43	1/18/2009	19:38	15	655	
08-16-503	ICV21	1	1	5/7/2008	12:00	26	C	6	67	1/18/2009	14:43	1/18/2009	19:16	15	1598	
08-16-503	ICV22	1	1	5/7/2008	12:00	27	C	6	92	1/18/2009	14:43	1/18/2009	19:38	15	1879	
08-16-503	ICV23	1	1	5/7/2008	12:00	47	F	1	42	1/18/2009	14:43	1/18/2009	19:16	15	1460	
08-16-503	ICV24	1	1	5/7/2008	12:00	49	F	1	25	1/18/2009	14:43	1/18/2009	19:38	15	1724	
08-16-503	ICV25	1	1	5/7/2008	12:00	12	E	3	1672	1/18/2009	14:56	1/18/2009	19:57	15	825	
08-16-503	ICV26	1	1	5/7/2008	12:00	14	E	3	16	1/18/2009	14:56	1/18/2009	20:15	15	849	
08-16-503	ICV27	1	1	5/7/2008	12:00	28	C	6	2991	1/18/2009	14:56	1/18/2009	19:57	15	2282	
08-16-503	ICV28	1	1	5/7/2008	12:00	29	C	6	3804	1/18/2009	14:56	1/18/2009	20:15	15	1469	
08-16-503	ICV29	1	1	5/7/2008	12:00	50	F	1	6	1/18/2009	14:56	1/18/2009	19:57	15	1060	
08-16-503	ICV30	1	1	5/7/2008	12:00	51	F	1	21	1/18/2009	14:56	1/18/2009	20:15	15	1483	
08-16-503	ICV31	1	1	5/7/2008	12:00	30	C	6	43	1/18/2009	15:05	1/18/2009	20:31	15	1504	
08-16-503	ICV32	1	1	5/7/2008	12:00	31	C	6	34	1/18/2009	15:05	1/18/2009	20:47	15	1286	

Initials Date

Spiked by: DBC 5/7/2008

Spike Witness: GDW 5/7/2008

Reviewed by:

Std./Ba Carrier ID	'Std./ Carrier Type	conc dpm/ mL	Spike Vol. (ml)	Activity added (dpm)	Ref. date
18.3020.76	Ra 226	100	1.0	100	9/1/2003

Expiration Date: 4/8/2009

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: LJJ
 Prep. Date S: 5/7/2008
 Prep. Date C: 1/18/2009
 SOP Used: 783R8

W.O.#	S	ID	S	V	Purge (end)		Flask	Counter		Scaler	CBKG		Deeman. (end)		Count Start		Count		REMARKS
					Date	Time	No.	No.	No.	No.	#	#	Date	Time	Date	Time	Duration	COUNT	
08-16-503	ICV1	1	5/7/2008	12:00	1	1	1	B	2	2	25	25	1/18/2009	13:16	1/18/2009	17:44	15	1184	
08-16-503	ICV2	1	5/7/2008	12:00	2	2	2	B	2	2	23	23	1/18/2009	13:16	1/18/2009	17:28	15	1625	
08-16-503	ICV3	1	5/7/2008	12:00	20	20	20	D	5	5	61	61	1/18/2009	13:16	1/18/2009	17:44	15	595	
08-16-503	ICV4	1	5/7/2008	12:00	21	21	21	D	5	5	50	50	1/18/2009	13:16	1/18/2009	17:28	15	598	
08-16-503	ICV5	1	5/7/2008	12:00	41	41	41	A	7	7	41	41	1/18/2009	13:16	1/18/2009	17:44	15	942	
08-16-503	ICV6	1	5/7/2008	12:00	42	42	42	A	7	7	55	55	1/18/2009	13:16	1/18/2009	17:28	15	1634	
08-16-503	ICV7	1	5/7/2008	12:00	3	3	3	B	2	2	16	16	1/18/2009	13:48	1/18/2009	18:18	15	2232	
08-16-503	ICV8	1	5/7/2008	12:00	4	4	4	B	2	2	28	28	1/18/2009	13:48	1/18/2009	18:01	15	1062	
08-16-503	ICV9	1	5/7/2008	12:00	22	22	22	D	5	5	52	52	1/18/2009	13:48	1/18/2009	18:18	15	1488	
08-16-503	ICV10	1	5/7/2008	12:00	23	23	23	D	5	5	74	74	1/18/2009	13:48	1/18/2009	18:01	15	1472	
08-16-503	ICV11	1	5/7/2008	12:00	43	43	43	A	7	7	12	12	1/18/2009	13:48	1/18/2009	18:18	15	1624	
08-16-503	ICV12	1	5/7/2008	12:00	44	44	44	A	7	7	28	28	1/18/2009	13:48	1/18/2009	18:01	15	1497	
08-16-503	ICV13	1	5/7/2008	12:00	6	6	6	B	2	2	27	27	1/18/2009	14:18	1/18/2009	18:59	15	2062	
08-16-503	ICV14	1	5/7/2008	12:00	8	8	8	B	2	2	39	39	1/18/2009	14:18	1/18/2009	18:40	15	2067	
08-16-503	ICV15	1	5/7/2008	12:00	24	24	24	D	5	5	74	74	1/18/2009	14:18	1/18/2009	18:59	15	2722	
08-16-503	ICV16	1	5/7/2008	12:00	25	25	25	D	5	5	79	79	1/18/2009	14:18	1/18/2009	18:40	15	2200	
08-16-503	ICV17	1	5/7/2008	12:00	45	45	45	A	7	7	60	60	1/18/2009	14:18	1/18/2009	18:59	15	1345	
08-16-503	ICV18	1	5/7/2008	12:00	46	46	46	A	7	7	37	37	1/18/2009	14:18	1/18/2009	18:40	15	1677	
08-16-503	ICV19	1	5/7/2008	12:00	9	9	9	B	2	2	37	37	1/18/2009	14:43	1/18/2009	19:38	15	1454	
08-16-503	ICV20	1	5/7/2008	12:00	10	10	10	B	2	2	1185	1185	1/18/2009	14:43	1/18/2009	19:16	15	594	
08-16-503	ICV21	1	5/7/2008	12:00	26	26	26	D	5	5	76	76	1/18/2009	14:43	1/18/2009	19:38	15	1600	
08-16-503	ICV22	1	5/7/2008	12:00	27	27	27	D	5	5	61	61	1/18/2009	14:43	1/18/2009	19:16	15	1859	
08-16-503	ICV23	1	5/7/2008	12:00	47	47	47	A	7	7	34	34	1/18/2009	14:43	1/18/2009	19:38	15	1639	
08-16-503	ICV24	1	5/7/2008	12:00	49	49	49	A	7	7	5	5	1/18/2009	14:43	1/18/2009	19:16	15	1831	
08-16-503	ICV25	1	5/7/2008	12:00	12	12	12	B	2	2	3310	3310	1/18/2009	14:56	1/18/2009	20:15	15	1771	
08-16-503	ICV26	1	5/7/2008	12:00	14	14	14	B	2	2	23	23	1/18/2009	14:56	1/18/2009	19:57	15	1971	
08-16-503	ICV27	1	5/7/2008	12:00	28	28	28	D	5	5	2905	2905	1/18/2009	14:56	1/18/2009	20:15	15	2292	
08-16-503	ICV28	1	5/7/2008	12:00	29	29	29	D	5	5	3865	3865	1/18/2009	14:56	1/18/2009	19:57	15	1469	
08-16-503	ICV29	1	5/7/2008	12:00	50	50	50	A	7	7	5	5	1/18/2009	14:56	1/18/2009	20:15	15	1105	
08-16-503	ICV30	1	5/7/2008	12:00	51	51	51	A	7	7	29	29	1/18/2009	14:56	1/18/2009	19:57	15	1587	
08-16-503	ICV31	1	5/7/2008	12:00	30	30	30	D	5	5	11	11	1/18/2009	15:05	1/18/2009	20:47	15	1460	
08-16-503	ICV32	1	5/7/2008	12:00	31	31	31	D	5	5	34	34	1/18/2009	15:05	1/18/2009	20:31	15	1281	

Initials Date

Spiked by: DBC 5/7/2008
 Spike Witness: GDW 5/7/2008
 Reviewed by:

Std./Ba Carrier ID	'Std./Carrier Type	conc dpm/mL	Spike Vol. (mL)	Activity added (dpm)	Ref. date
18-3020.76	Ra 226	100	1.0	100	9/1/2003

Expiration Date: 4/8/2009

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: L.J.F

Prep. Date S: 5/7/2008

Prep. Date C: 1/18/2009

SOP Used: 783R8

W.O.#	S	V	S	Purge (end)		Flask No.	Counter No.	Scaler No.	CBKG #	Deeman. (end)		Count Start		Count Duration (min.)	COUNT #	REMARKS
				Date	Time					Date	Time	Date	Time			
08-16-503	ICV1	1	1	5/7/2008	12:00	1	E	3	12	1/18/2009	13:16	1/18/2009	17:28	15	363	
08-16-503	ICV2	1	1	5/7/2008	12:00	2	E	3	18	1/18/2009	13:16	1/18/2009	17:44	15	773	
08-16-503	ICV3	1	1	5/7/2008	12:00	20	C	6	36	1/18/2009	13:16	1/18/2009	17:28	15	1246	
08-16-503	ICV4	1	1	5/7/2008	12:00	21	C	6	53	1/18/2009	13:16	1/18/2009	17:44	15	1130	
08-16-503	ICV5	1	1	5/7/2008	12:00	41	F	1	44	1/18/2009	13:16	1/18/2009	17:28	15	875	
08-16-503	ICV6	1	1	5/7/2008	12:00	42	F	1	60	1/18/2009	13:16	1/18/2009	17:44	15	1504	
08-16-503	ICV7	1	1	5/7/2008	12:00	3	E	3	15	1/18/2009	13:48	1/18/2009	18:01	15	804	
08-16-503	ICV8	1	1	5/7/2008	12:00	4	E	3	18	1/18/2009	13:48	1/18/2009	18:18	15	382	
08-16-503	ICV9	1	1	5/7/2008	12:00	22	C	6	57	1/18/2009	13:48	1/18/2009	18:01	15	1518	
08-16-503	ICV10	1	1	5/7/2008	12:00	23	C	6	76	1/18/2009	13:48	1/18/2009	18:18	15	1516	
08-16-503	ICV11	1	1	5/7/2008	12:00	43	F	1	16	1/18/2009	13:48	1/18/2009	18:01	15	1513	
08-16-503	ICV12	1	1	5/7/2008	12:00	44	F	1	25	1/18/2009	13:48	1/18/2009	18:18	15	1360	
08-16-503	ICV13	1	1	5/7/2008	12:00	6	E	3	11	1/18/2009	14:18	1/18/2009	18:40	15	857	
08-16-503	ICV14	1	1	5/7/2008	12:00	8	E	3	18	1/18/2009	14:18	1/18/2009	18:59	15	880	
08-16-503	ICV15	1	1	5/7/2008	12:00	24	C	6	54	1/18/2009	14:18	1/18/2009	18:40	15	2732	
08-16-503	ICV16	1	1	5/7/2008	12:00	25	C	6	96	1/18/2009	14:18	1/18/2009	18:59	15	2282	
08-16-503	ICV17	1	1	5/7/2008	12:00	45	F	1	48	1/18/2009	14:18	1/18/2009	18:40	15	1324	
08-16-503	ICV18	1	1	5/7/2008	12:00	46	F	1	34	1/18/2009	14:18	1/18/2009	18:59	15	1638	
08-16-503	ICV19	1	1	5/7/2008	12:00	9	E	3	13	1/18/2009	14:43	1/18/2009	19:16	15	1345	
08-16-503	ICV20	1	1	5/7/2008	12:00	10	E	3	410	1/18/2009	14:43	1/18/2009	19:38	15	655	
08-16-503	ICV21	1	1	5/7/2008	12:00	26	C	6	67	1/18/2009	14:43	1/18/2009	19:16	15	1598	
08-16-503	ICV22	1	1	5/7/2008	12:00	27	C	6	92	1/18/2009	14:43	1/18/2009	19:38	15	1879	
08-16-503	ICV23	1	1	5/7/2008	12:00	47	F	1	42	1/18/2009	14:43	1/18/2009	19:16	15	1460	
08-16-503	ICV24	1	1	5/7/2008	12:00	49	F	1	25	1/18/2009	14:43	1/18/2009	19:38	15	1724	
08-16-503	ICV25	1	1	5/7/2008	12:00	12	E	3	1672	1/18/2009	14:56	1/18/2009	19:57	15	825	
08-16-503	ICV26	1	1	5/7/2008	12:00	14	E	3	16	1/18/2009	14:56	1/18/2009	20:15	15	849	
08-16-503	ICV27	1	1	5/7/2008	12:00	28	C	6	2991	1/18/2009	14:56	1/18/2009	19:57	15	2282	
08-16-503	ICV28	1	1	5/7/2008	12:00	29	C	6	3804	1/18/2009	14:56	1/18/2009	20:15	15	1469	
08-16-503	ICV29	1	1	5/7/2008	12:00	50	F	1	6	1/18/2009	14:56	1/18/2009	19:57	15	1060	
08-16-503	ICV30	1	1	5/7/2008	12:00	51	F	1	21	1/18/2009	14:56	1/18/2009	20:15	15	1483	
08-16-503	ICV31	1	1	5/7/2008	12:00	30	C	6	43	1/18/2009	15:05	1/18/2009	20:31	15	1504	
08-16-503	ICV32	1	1	5/7/2008	12:00	31	C	6	34	1/18/2009	15:05	1/18/2009	20:47	15	1286	
08-16-503	ICV33	1	1	5/7/2008	12:00	20	C	6	9	1/26/2009	13:18	1/26/2009	17:31	30	1677	
08-16-503	ICV34	1	1	5/7/2008	12:00	21	C	6	11	1/26/2009	13:18	1/26/2009	18:03	30	2378	
08-16-503	ICV35	1	1	5/7/2008	12:00	10	E	3	15	1/26/2009	13:18	1/26/2009	17:31	30	3088	
08-16-503	ICV36	1	1	5/7/2008	12:00	12	E	3	14	1/26/2009	13:18	1/26/2009	18:03	30	2835	
08-16-503	ICV37	1	1	5/7/2008	12:00	28	C	6	9	1/27/2009	11:33	1/27/2009	15:49	15	2512	
08-16-503	ICV38	1	1	5/7/2008	12:00	29	C	6	8	1/27/2009	11:33	1/27/2009	16:19	15	1724	

Std./Ba Carrier ID	'Std./Carrier Type	conc dpm/mL	Spike Vol. (mL)	Activity added (dpm)	Ref. date
818.3020.76	Ra 226	100	1.0	100	9/1/2003

Initials Date
 Spiked by: DBC 5/7/2008
 Spike Witness: GDW 5/7/2008
 Reviewed by:

Expiration Date: 4/8/2009

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: LJF

Prep. Date S: 5/7/2008

Prep. Date C: 1/18/2009

SOP Used: 783R8

W.O.#	S	V	Purge (end)		Flask	Counter		Scaler	CBKG	Deeman. (end)		Count Start		Count		REMARKS
	ID	(L)	Date	Time	No.	No.	No.	No.	#	Date	Time	Date	Time	Duration (min.)	COUNT #	
08-16-503	ICV1	1	5/7/2008	12:00	1	B	2	2	25	1/18/2009	13:16	1/18/2009	17:44	15	1184	
08-16-503	ICV2	1	5/7/2008	12:00	2	B	2	2	23	1/18/2009	13:16	1/18/2009	17:28	15	1625	
08-16-503	ICV3	1	5/7/2008	12:00	20	D	5	5	61	1/18/2009	13:16	1/18/2009	17:44	15	595	
08-16-503	ICV4	1	5/7/2008	12:00	21	D	5	5	50	1/18/2009	13:16	1/18/2009	17:28	15	598	
08-16-503	ICV5	1	5/7/2008	12:00	41	A	7	7	41	1/18/2009	13:16	1/18/2009	17:44	15	942	
08-16-503	ICV6	1	5/7/2008	12:00	42	A	7	7	55	1/18/2009	13:16	1/18/2009	17:28	15	1634	
08-16-503	ICV7	1	5/7/2008	12:00	3	B	2	2	16	1/18/2009	13:48	1/18/2009	18:18	15	2232	
08-16-503	ICV8	1	5/7/2008	12:00	4	B	2	2	28	1/18/2009	13:48	1/18/2009	18:01	15	1062	
08-16-503	ICV9	1	5/7/2008	12:00	22	D	5	5	52	1/18/2009	13:48	1/18/2009	18:18	15	1488	
08-16-503	ICV10	1	5/7/2008	12:00	23	D	5	5	74	1/18/2009	13:48	1/18/2009	18:01	15	1472	
08-16-503	ICV11	1	5/7/2008	12:00	43	A	7	7	12	1/18/2009	13:48	1/18/2009	18:18	15	1624	
08-16-503	ICV12	1	5/7/2008	12:00	44	A	7	7	28	1/18/2009	13:48	1/18/2009	18:01	15	1497	
08-16-503	ICV13	1	5/7/2008	12:00	6	B	2	2	27	1/18/2009	14:18	1/18/2009	18:59	15	2062	
08-16-503	ICV14	1	5/7/2008	12:00	8	B	2	2	39	1/18/2009	14:18	1/18/2009	18:40	15	2067	
08-16-503	ICV15	1	5/7/2008	12:00	24	D	5	5	74	1/18/2009	14:18	1/18/2009	18:59	15	2722	
08-16-503	ICV16	1	5/7/2008	12:00	25	D	5	5	79	1/18/2009	14:18	1/18/2009	18:40	15	2200	
08-16-503	ICV17	1	5/7/2008	12:00	45	A	7	7	60	1/18/2009	14:18	1/18/2009	18:59	15	1345	
08-16-503	ICV18	1	5/7/2008	12:00	46	A	7	7	37	1/18/2009	14:18	1/18/2009	18:40	15	1677	
08-16-503	ICV19	1	5/7/2008	12:00	9	B	2	2	37	1/18/2009	14:43	1/18/2009	19:38	15	1454	
08-16-503	ICV20	1	5/7/2008	12:00	10	B	2	2	185	1/18/2009	14:43	1/18/2009	19:16	15	594	
08-16-503	ICV21	1	5/7/2008	12:00	26	D	5	5	76	1/18/2009	14:43	1/18/2009	19:38	15	1600	
08-16-503	ICV22	1	5/7/2008	12:00	27	D	5	5	61	1/18/2009	14:43	1/18/2009	19:16	15	1859	
08-16-503	ICV23	1	5/7/2008	12:00	47	A	7	7	34	1/18/2009	14:43	1/18/2009	19:38	15	1639	
08-16-503	ICV24	1	5/7/2008	12:00	49	A	7	7	5	1/18/2009	14:43	1/18/2009	19:16	15	1831	
08-16-503	ICV25	1	5/7/2008	12:00	12	B	2	2	3310	1/18/2009	14:56	1/18/2009	20:15	15	1771	
08-16-503	ICV26	1	5/7/2008	12:00	14	B	2	2	23	1/18/2009	14:56	1/18/2009	19:57	15	1971	
08-16-503	ICV27	1	5/7/2008	12:00	28	D	5	5	2905	1/18/2009	14:56	1/18/2009	20:15	15	2292	
08-16-503	ICV28	1	5/7/2008	12:00	29	D	5	5	3865	1/18/2009	14:56	1/18/2009	19:57	15	1469	
08-16-503	ICV29	1	5/7/2008	12:00	50	A	7	7	5	1/18/2009	14:56	1/18/2009	20:15	15	1105	
08-16-503	ICV30	1	5/7/2008	12:00	51	A	7	7	29	1/18/2009	14:56	1/18/2009	19:57	15	1587	
08-16-503	ICV31	1	5/7/2008	12:00	30	D	5	5	11	1/18/2009	15:05	1/18/2009	20:47	15	1460	
08-16-503	ICV32	1	5/7/2008	12:00	31	D	5	5	34	1/18/2009	15:05	1/18/2009	20:31	15	1281	
08-16-503	ICV33	1	5/7/2008	12:00	20	D	6	6	19	1/26/2009	13:18	1/26/2009	18:03	30	4419	
08-16-503	ICV34	1	5/7/2008	12:00	21	D	6	6	11	1/26/2009	13:18	1/26/2009	17:31	30	4529	
08-16-503	ICV35	1	5/7/2008	12:00	10	B	3	3	17	1/26/2009	13:18	1/26/2009	18:03	30	3091	
08-16-503	ICV36	1	5/7/2008	12:00	12	B	3	3	19	1/26/2009	13:18	1/26/2009	17:31	30	2832	
08-16-503	ICV37	1	5/7/2008	12:00	28	D	6	6	7	1/27/2009	11:33	1/27/2009	15:49	15	2578	
08-16-503	ICV38	1	5/7/2008	12:00	29	D	6	6	12	1/27/2009	11:33	1/27/2009	16:19	15	1837	

Initials Date

Spiked by: DBC 5/7/2008

Spike Witness: GDW 5/7/2008

Reviewed by:

Std./Ba Carrier ID	'Std./Carrier Type	conc dpm/mL	Spike Vol. (mL)	Activity added (dpm)	Ref. date
818.3020.76	Ra 226	100	1.0	100	9/1/2003

Expiration Date: 4/8/2009

' Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

ICV Radiometric Recovery Summary for 3E, 6C, and 1F

			S												Ra-226		Ra-226		Ra-226		Ra-226		Radiometric	
W.O.#	ID	V	S	(L)	Flask No.	Counter No.	Scaler No.	Efficiency	Denom	Activity (pCi/l)	Cnt. Unc.	2 sig. TPU	MDC	Sample ID	Recovery (%)									
08-16-503	ICV1	1		1	1	E	3	0.42274271	0.00171528	25.76	2.79	3.42	1.38	816503.00	ICV1	57.31%								
08-16-503	ICV2	1		2	2	E	3	0.89020718	0.00360474	26.37	1.93	2.79	0.78	816503.00	ICV2	58.66%								
08-16-503	ICV3	1		20	20	C	6	1.34537501	0.00545885	27.91	1.62	2.69	0.71	816503.00	ICV3	62.08%								
08-16-503	ICV4	1		21	21	C	6	1.37421263	0.00556464	24.37	1.53	2.41	0.83	816503.00	ICV4	54.20%								
08-16-503	ICV5	1		41	41	F	1	0.97247276	0.0039458	26.51	1.90	2.78	1.07	816503.00	ICV5	58.98%								
08-16-503	ICV6	1		42	42	F	1	1.34830492	0.00545973	33.30	1.79	3.12	0.89	816503.00	ICV6	74.07%								
08-16-503	ICV7	1		3	3	E	3	0.7576273	0.00307368	32.32	2.30	3.38	0.85	816503.00	ICV7	71.89%								
08-16-503	ICV8	1		4	4	E	3	0.66487697	0.00269163	17.03	1.83	2.25	1.05	816503.00	ICV8	37.87%								
08-16-503	ICV9	1		22	22	C	6	1.34855684	0.00547108	33.62	1.79	3.14	0.87	816503.00	ICV9	74.78%								
08-16-503	ICV10	1		23	23	C	6	1.78943031	0.00724417	25.03	1.36	2.35	0.75	816503.00	ICV10	55.67%								
08-16-503	ICV11	1		43	43	F	1	1.61431206	0.00654924	28.78	1.47	2.66	0.41	816503.00	ICV11	64.01%								
08-16-503	ICV12	1		44	44	F	1	0.97853738	0.00396142	42.43	2.32	4.00	0.83	816503.00	ICV12	94.38%								
08-16-503	ICV13	1		6	6	E	3	0.75697394	0.00306755	34.72	2.37	3.57	0.74	816503.00	ICV13	77.23%								
08-16-503	ICV14	1		8	8	E	3	0.75898259	0.00306835	35.37	2.41	3.63	0.92	816503.00	ICV14	78.68%								
08-16-503	ICV15	1		24	24	C	6	1.93589549	0.00784501	42.98	1.66	3.69	0.59	816503.00	ICV15	95.60%								
08-16-503	ICV16	1		25	25	C	6	2.19681166	0.00888107	30.99	1.35	2.74	0.68	816503.00	ICV16	68.93%								
08-16-503	ICV17	1		45	45	F	1	1.49371181	0.0060531	26.54	1.51	2.54	0.73	816503.00	ICV17	59.03%								
08-16-503	ICV18	1		46	46	F	1	0.97722571	0.00395064	51.11	2.55	4.68	0.95	816503.00	ICV18	113.70%								
08-16-503	ICV19	1		9	9	E	3	0.78662216	0.00318329	52.68	2.86	4.95	0.77	816503.00	ICV19	117.18%								
08-16-503	ICV20	1		10	10	E	3	0.70992651	0.00286497	10.77	2.81	2.93	4.26	816503.00	ICV20	23.95%								
08-16-503	ICV21	1		26	26	C	6	1.85310253	0.0074991	25.70	1.34	2.39	0.68	816503.00	ICV21	57.17%								
08-16-503	ICV22	1		27	27	C	6	1.90090498	0.00767127	29.33	1.43	2.67	0.78	816503.00	ICV22	65.24%								
08-16-503	ICV23	1		47	47	F	1	1.07595118	0.00435414	41.00	2.20	3.84	0.95	816503.00	ICV23	91.20%								
08-16-503	ICV24	1		49	49	F	1	1.4451	0.0058319	36.68	1.77	3.33	0.56	816503.00	ICV24	81.59%								
08-16-503	ICV25	1		12	12	E	3	0.8036	0.00324072	-32.90	3.80	4.57	7.49	816503.00	ICV25	-73.19%								
08-16-503	ICV26	1		14	14	E	3	0.7308	0.00294038	35.67	2.47	3.69	0.91	816503.00	ICV26	79.34%								
08-16-503	ICV27	1		28	28	C	6	1.5470	0.0062383	-14.31	2.87	3.08	5.19	816503.00	ICV27	-31.83%								
08-16-503	ICV28	1		29	29	C	6	1.8558	0.00746651	-39.37	2.40	3.86	4.88	816503.00	ICV28	-87.58%								
08-16-503	ICV29	1		50	50	F	1	0.8737	0.00352337	37.66	2.29	3.69	0.50	816503.00	ICV29	83.78%								
08-16-503	ICV30	1		51	51	F	1	1.6593	0.00667616	27.57	1.43	2.56	0.45	816503.00	ICV30	61.33%								
08-16-503	ICV31	1		30	30	C	6	1.5056	0.00605247	30.39	1.60	2.83	0.69	816503.00	ICV31	67.60%								
08-16-503	ICV32	1		31	31	C	6	1.3109	0.00526965	29.91	1.70	2.86	0.71	816503.00	ICV32	66.54%								

ICV Radiometric Recovery Summary for 2B, 5D, and 1F

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ICV Radiometric Recovery Summary for 3E, 6C, and 1F

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Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

ICV Radiometric Recovery Summary for 2B, 5D, and 1F

			S												
	S	V	Flask	Counter	Scaler		Efficiency	Denom	Ra-226	Ra-226	Ra-226	Ra-226	Ra-226		Radiometric
W.O.#	ID	(L)	No.	No.	No.				Activity (pCi/l)	Cnt. Unc.	2 sig. TPU	MDC	Sample ID	Recovery (%)	
08-16-503	ICV1	1	1	B	2		1.22418457	0.00495713	29.43	1.73	2.85	0.66	816503.00	ICV1	65.48%
08-16-503	ICV2	1	2	B	2		1.89968967	0.00770798	26.17	1.30	2.39	0.41	816503.00	ICV2	58.20%
08-16-503	ICV3	1	20	D	5		1.39362595	0.00564325	11.91	1.12	1.45	0.87	816503.00	ICV3	26.50%
08-16-503	ICV4	1	21	D	5		1.38278225	0.00561063	12.30	1.12	1.46	0.80	816503.00	ICV4	27.35%
08-16-503	ICV5	1	41	A	7		1.06744924	0.00432246	26.24	1.79	2.70	0.95	816503.00	ICV5	58.38%
08-16-503	ICV6	1	42	A	7		1.47150153	0.00597061	33.29	1.70	3.07	0.78	816503.00	ICV6	74.06%
08-16-503	ICV7	1	3	B	2		1.84005546	0.00744912	37.45	1.57	3.28	0.36	816503.00	ICV7	83.31%
08-16-503	ICV8	1	4	B	2		1.59787128	0.00648254	20.08	1.26	1.99	0.53	816503.00	ICV8	44.67%
08-16-503	ICV9	1	22	D	5		1.3191928	0.0053405	33.85	1.81	3.17	0.85	816503.00	ICV9	75.30%
08-16-503	ICV10	1	23	D	5		1.83784203	0.0074561	23.60	1.30	2.23	0.72	816503.00	ICV10	52.51%
08-16-503	ICV11	1	43	A	7		1.76785298	0.00715682	28.36	1.39	2.59	0.33	816503.00	ICV11	63.08%
08-16-503	ICV12	1	44	A	7		1.0369	0.0042068	43.96	2.29	4.08	0.82	816503.00	ICV12	97.79%
08-16-503	ICV13	1	6	B	2		1.6760	0.00677553	37.81	1.66	3.35	0.50	816503.00	ICV13	84.11%
08-16-503	ICV14	1	8	B	2		1.6492	0.00668314	38.20	1.69	3.39	0.60	816503.00	ICV14	84.98%
08-16-503	ICV15	1	24	D	5		1.9252	0.00778297	42.83	1.68	3.69	0.69	816503.00	ICV15	95.28%
08-16-503	ICV16	1	25	D	5		2.1979	0.00890682	29.98	1.32	2.66	0.62	816503.00	ICV16	66.69%
08-16-503	ICV17	1	45	A	7		1.6456	0.0066527	24.32	1.39	2.33	0.73	816503.00	ICV17	54.09%
08-16-503	ICV18	1	46	A	7		1.0845	0.00439478	46.98	2.32	4.29	0.89	816503.00	ICV18	104.51%
08-16-503	ICV19	1	9	B	2		1.9837	0.0080055	22.28	1.19	2.08	0.49	816503.00	ICV19	49.57%
08-16-503	ICV20	1	10	B	2		1.51664166	0.00613752	-12.12	1.70	1.93	3.34	816503.00	ICV20	-26.97%
08-16-503	ICV21	1	26	D	5		1.8717	0.0075533	25.40	1.34	2.37	0.72	816503.00	ICV21	56.50%
08-16-503	ICV22	1	27	D	5		1.9258	0.00779337	29.04	1.39	2.63	0.63	816503.00	ICV22	64.61%
08-16-503	ICV23	1	47	A	7		1.2229	0.00493493	40.94	2.05	3.75	0.76	816503.00	ICV23	91.08%
08-16-503	ICV24	1	49	A	7		1.5450	0.00625248	36.77	1.69	3.29	0.26	816503.00	ICV24	81.79%
08-16-503	ICV25	1	12	B	2		1.00658307	0.0040499	-47.84	4.34	5.69	8.40	816503.00	ICV25	-106.42%
08-16-503	ICV26	1	14	B	2		1.6973	0.0068443	35.83	1.61	3.19	0.46	816503.00	ICV26	79.71%
08-16-503	ICV27	1	28	D	5		1.5280	0.00614773	-12.55	2.89	3.05	5.19	816503.00	ICV27	-27.92%
08-16-503	ICV28	1	29	D	5		1.9122	0.00771121	-39.12	2.34	3.81	4.76	816503.00	ICV28	-87.02%
08-16-503	ICV29	1	50	A	7		0.9484	0.00381569	36.29	2.15	3.52	0.43	816503.00	ICV29	80.73%
08-16-503	ICV30	1	51	A	7		1.8050	0.00727857	26.95	1.36	2.48	0.48	816503.00	ICV30	59.95%
08-16-503	ICV31	1	30	D	5		1.4618	0.00586425	31.11	1.61	2.88	0.39	816503.00	ICV31	69.20%
08-16-503	ICV32	1	31	D	5		1.3444	0.00540433	29.05	1.66	2.78	0.69	816503.00	ICV32	64.62%
08-16-503	ICV33	1	20	D	6		1.393626	0.011252	49.23	1.46	4.05	0.26	816503.00	ICV33	109.51%
08-16-503	ICV34	1	21	D	6		1.382782	0.011209	50.74	1.48	4.17	0.20	816503.00	ICV34	112.88%
08-16-503	ICV35	1	10	B	3		1.516642	0.012245	31.60	1.12	2.67	0.22	816503.00	ICV35	70.30%
08-16-503	ICV36	1	12	B	3		1.006583	0.00816	43.40	1.61	3.70	0.35	816503.00	ICV36	96.55%
08-16-503	ICV37	1	28	D	6		1.5280	0.006173	52.43	2.03	4.51	0.31	816503.00	ICV37	116.63%
08-16-503	ICV38	1	29	C	6		1.9122	0.007755	29.63	1.37	2.65	0.31	816503.00	ICV38	65.90%

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: L.JF
 Prep. Date S: 5/7/2008
 Prep. Date C: 5/7/2008
 SOP Used: 783R8

W.O.#	S	V	S	Purge (end)		Flask No.	Counter No.	Scaler No.	CBKG #	BKG DUR (min)	CBKG (CORR)	Deeman (end)		Count Start		Count Duration (min.)	COUNT #		REMARKS
				Date	Time							Date	Time	Date	Time				
08-16-503	ICV1	1	5/7/2008	12:00	T1	1	E	3	12	15	#DIV/0!	11/18/01	13:16	11/18/01	17:28	15	3623		
08-16-503	ICV2	1	5/7/2008	12:00		2	E	3	18		#DIV/0!				17:44		773		
08-16-503	ICV3	1	5/7/2008	12:00		20	C	6	36		#DIV/0!				17:26		1246		
08-16-503	ICV4	1	5/7/2008	12:00		21	C	6	53		#DIV/0!				17:44		1130		
08-16-503	ICV5	1	5/7/2008	12:00		41	F	1	44		#DIV/0!				17:28		875		
08-16-503	ICV6	1	5/7/2008	12:00		42	F	1	60		#DIV/0!				17:44		1504		
08-16-503	ICV7	1	5/7/2008	12:00		3	E	3	15		#DIV/0!	13:48			18:01		804		
08-16-503	ICV8	1	5/7/2008	12:00		4	E	3	18		#DIV/0!				18:18		382		
08-16-503	ICV9	1	5/7/2008	12:00		22	C	6	57		#DIV/0!				18:01		1518		
08-16-503	ICV10	1	5/7/2008	12:00		23	C	6	76		#DIV/0!				18:18		1513		
08-16-503	ICV11	1	5/7/2008	12:00		43	F	1	16		#DIV/0!				18:18		1513		
08-16-503	ICV12	1	5/7/2008	12:00		44	F	1	25		#DIV/0!				18:18		1360		
08-16-503	ICV13	1	5/7/2008	12:00		6	E	3	11		#DIV/0!	14:00			18:40		857		
08-16-503	ICV14	1	5/7/2008	12:00		8	E	3	18		#DIV/0!				18:59		880		
08-16-503	ICV15	1	5/7/2008	12:00		24	C	6	54		#DIV/0!				18:40		2732		
08-16-503	ICV16	1	5/7/2008	12:00		25	C	6	96		#DIV/0!				18:59		2282		
08-16-503	ICV17	1	5/7/2008	12:00		45	F	1	48		#DIV/0!				18:40		1324		
08-16-503	ICV18	1	5/7/2008	12:00		46	F	1	34		#DIV/0!				18:57		11638		
08-16-503	ICV19	1	5/7/2008	12:00		9	E	3	13		#DIV/0!	14:43			19:16		1345		
08-16-503	ICV20	1	5/7/2008	12:00		10	E	3	410		#DIV/0!				19:38		655		
08-16-503	ICV21	1	5/7/2008	12:00		26	C	6	67		#DIV/0!				19:16		1578		
08-16-503	ICV22	1	5/7/2008	12:00		27	C	6	92		#DIV/0!				19:38		1879		
08-16-503	ICV23	1	5/7/2008	12:00		47	F	1	42		#DIV/0!				19:16		1460		
08-16-503	ICV24	1	5/7/2008	12:00		49	F	1	25		#DIV/0!				19:38		1724		
08-16-503	ICV25	1	5/7/2008	12:00		12	E	3	1672		#DIV/0!	14:56			19:57		825		
08-16-503	ICV26	1	5/7/2008	12:00		14	E	3	16		#DIV/0!				20:15		849		
08-16-503	ICV27	1	5/7/2008	12:00		28	C	6	291		#DIV/0!				19:57		2282		
08-16-503	ICV28	1	5/7/2008	12:00		29	C	6	384		#DIV/0!				20:15		1469		
08-16-503	ICV29	1	5/7/2008	12:00		50	F	1	6		#DIV/0!				19:57		1060		
08-16-503	ICV30	1	5/7/2008	12:00		51	F	1	21		#DIV/0!				20:15		1483		
08-16-503	ICV31	1	5/7/2008	12:00		30	C	6	43		#DIV/0!				20:31	✓	1504		
08-16-503	ICV32	1	5/7/2008	12:00		31	C	6	34		#DIV/0!				20:47		1286		

Initials Date

Spiked by: DBC 5/7/2008
 Spike Witness: GDW 5/7/2008
 Reviewed by:

Sid./Carrier ID	Type	Conc dpm/mL	Spike Vol. (mL)	Activity added (dpm)	Pipet No.	Ref. date
818.3020.76	Ra 226	100	1.0	100	RS-005	9/1/2003

Expiration Date: 4/8/2009

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: LJF

Prep. Date S: 5/7/2008

Prep. Date C: 5/7/2008

SOP Used: 783RB

W.O.#	S	V	S	Purge (end)		Flask No.	Counter No.	Scaler No.	CBKG #	BKG DUR (min)	CBKG (CORR.)	Decman. (end)		Count Start		Count	REMARKS
				Date	Time							Date	Time	Date	Time	Duration (min.)	
08-16-503	ICV1	1	5/7/2008	12:00	T1	1	B	2	25	15	#DIV/0!	118109	1316	118109	1744	15	1184
08-16-503	ICV2	1	5/7/2008	12:00	T2	2	B	2	23		#DIV/0!				1720		1625
08-16-503	ICV3	1	5/7/2008	12:00	T3	20	D	5	61		#DIV/0!				1744		595
08-16-503	ICV4	1	5/7/2008	12:00	T4	21	D	5	41		#DIV/0!				1720		548
08-16-503	ICV5	1	5/7/2008	12:00	T5	41	A	7	55		#DIV/0!				1744		542
08-16-503	ICV6	1	5/7/2008	12:00	T6	47	A	7	55		#DIV/0!				1720		1634
08-16-503	ICV7	1	5/7/2008	12:00	T7	3	B	2	16		#DIV/0!				1720		2232
08-16-503	ICV8	1	5/7/2008	12:00	T8	4	B	2	26		#DIV/0!				1720		1062
08-16-503	ICV9	1	5/7/2008	12:00	T9	22	D	5	52		#DIV/0!				1720		1438
08-16-503	ICV10	1	5/7/2008	12:00	T10	23	D	5	74		#DIV/0!				1720		1472
08-16-503	ICV11	1	5/7/2008	12:00	T11	43	A	7	12		#DIV/0!				1720		1624
08-16-503	ICV12	1	5/7/2008	12:00	T12	44	A	7	28		#DIV/0!				1720		1497
08-16-503	ICV13	1	5/7/2008	12:00	T13	6	B	2	27		#DIV/0!				1720		2062
08-16-503	ICV14	1	5/7/2008	12:00	T14	8	B	2	39		#DIV/0!				1720		2067
08-16-503	ICV15	1	5/7/2008	12:00	T15	24	D	5	74		#DIV/0!				1720		2722
08-16-503	ICV16	1	5/7/2008	12:00	T16	25	D	5	74		#DIV/0!				1720		2200
08-16-503	ICV17	1	5/7/2008	12:00	T17	45	A	7	60		#DIV/0!				1720		1345
08-16-503	ICV18	1	5/7/2008	12:00	T18	46	A	7	37		#DIV/0!				1720		1677
08-16-503	ICV19	1	5/7/2008	12:00	T19	9	B	2	37		#DIV/0!				1720		1454
08-16-503	ICV20	1	5/7/2008	12:00	T20	10	B	2	185		#DIV/0!				1720		574
08-16-503	ICV21	1	5/7/2008	12:00	T21	26	D	5	61		#DIV/0!				1720		1600
08-16-503	ICV22	1	5/7/2008	12:00	T22	27	D	5	76		#DIV/0!				1720		1859
08-16-503	ICV23	1	5/7/2008	12:00	T23	47	A	7	34		#DIV/0!				1720		1639
08-16-503	ICV24	1	5/7/2008	12:00	T24	49	A	7	5		#DIV/0!				1720		1831
08-16-503	ICV25	1	5/7/2008	12:00	T25	12	B	2	3310		#DIV/0!				1720		1771
08-16-503	ICV26	1	5/7/2008	12:00	T26	14	B	2	23		#DIV/0!				1720		1971
08-16-503	ICV27	1	5/7/2008	12:00	T27	28	D	5	2905		#DIV/0!				1720		2292
08-16-503	ICV28	1	5/7/2008	12:00	T28	29	D	5	3865		#DIV/0!				1720		1469
08-16-503	ICV29	1	5/7/2008	12:00	T29	30	A	7	5		#DIV/0!				1720		1105
08-16-503	ICV30	1	5/7/2008	12:00	T30	51	A	7	29		#DIV/0!				1720		1587
08-16-503	ICV31	1	5/7/2008	12:00	T31	30	D	5	11		#DIV/0!				1720		1460
08-16-503	ICV32	1	5/7/2008	12:00	T32	31	D	5	34		#DIV/0!				1720		1281

Initials Date

Spiked by: DBC 5/7/2008

Spike Witness: GDW 5/7/2008

Reviewed by:

Sid/Ba Carrier ID	Sid/Carrier Type	conc dpm/mL	Spike Vol. (mL)	Activity added (dpm)	Ref. date
818.3020.76	Ra 226	100	1.0	100	9/1/2003

Expiration Date: 4/8/2009

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: LJF
 Prep. Date S: 5/7/2008
 Prep. Date C: 5/7/2008
 SOP Used: 783R8

W.O.#	S	V	ID	Purge (end)		Fleck No.	Counter No.	Scatter No.	CBKG #	BKG DUR (min)	CBKG (CORR.)	Deeman. (end)		Count Start		Count		REMARKS
				Date	Time							Date	Time	Date	Time	Duration (min.)	COUNT #	
08-16-503	ICV33	1	1	5/7/2008	12:00	20	C	4	9	30	#DIV/0!	1124104	13:18	1124109	17:31	30	1677	
08-16-503	ICV34	1	1	5/7/2008	12:00	21	C	6	11	1	#DIV/0!				18:03	1	2378	
08-16-503	ICV35	1	1	5/7/2008	12:00	10	E	3	15		#DIV/0!				17:31		3088	
08-16-503	ICV36	1	1	5/7/2008	12:00	12	E	3	14		#DIV/0!				18:03		2835	
08-16-503	ICV37	1	1	5/7/2008	12:00	28	C	6	9	15	#DIV/0!	1127109	11:33	1127109	15:49	15	2512	
08-16-503	ICV38	1	1	5/7/2008	12:00	29	C	6	8		#DIV/0!				14:19		1724	

Initials Date

Spiked by: DBC 5/7/2008
 Spike Witness: GDW 5/7/2008
 Reviewed by:

Sid./Carrier Type	Conc dpm/mL	Spike Vol. (mL)	Pipet No.	Activity added (dpm)	Ref. date
818.3020.76 Re 226	100	1.0	RS-005	100	9/1/2003

Expiration Date: 4/8/2009

Radium-226 in Water by Radon Emanation Technique for Calibration--Method 903.1

Analyst: LJF
 Prep. Date S: 5/7/2008
 Prep. Date C: 5/7/2008
 SOP Used: 783R8

W.O.#	S	V	Purge (end)		Flask No.	Counter No.	Scaler No.	CBKG #	BKG DUR (min)	CBKG (CORR.)	Deeman. (end)		Count Start		Count Duration (min.)	COUNT #	REMARKS
	ID	(L)	Date	Time	T1	No.	No.	#	(min)	(CORR.)	Date	Time	Date	Time			
08-16-503	ICV33	1	5/7/2008	12:00	20	D	5	19	30	#DIV/0!	1/24/09	13:13	1/24/09	18:03	30	4419	
08-16-503	ICV34	1	5/7/2008	12:00	21	D	5	11	1	#DIV/0!				17:31	1	4529	
08-16-503	ICV35	1	5/7/2008	12:00	10	B	2	17	1	#DIV/0!				18:03	1	3091	
08-16-503	ICV36	1	5/7/2008	12:00	12	B	2	19	1	#DIV/0!		✓	✓	17:31	1	2832	
08-16-503	ICV37	1	5/7/2008	12:00	20	D	5	7	15	#DIV/0!	1/27/09	11:33	1/27/09	16:17	15	2578	
08-16-503	ICV38	1	5/7/2008	12:00	29	D	5	17	1	#DIV/0!		✓	✓	15:49	1	1837	

Initials Date

Spiked by: DBC 5/7/2008
 Spike Witness: GDW 5/7/2008
 Reviewed by:

Sr./Ba Carrier ID	Sr./Carrier Type	Conc dpm/mL	Spike Vol. (mL)	Pipet No.	Activity added (dpm)	Ref. date
818.3020.76	Ra 226	100	1.0	RS-005	100	9/1/2003

Expiration Date: 4/8/2009

370036

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
0718511-37325	N/A	LC	31	N/A	11/10/09	9:55	15	30	8	11/10/09	16:37	10430	40	5
↓	↓	SD	30	↓	↓	↓	17	↓	8	↓	↓	10180	35	8
↓	↓	IF	51	↓	↓	9:19	8	↓	8	↓	16:34	6230	31	00C
↓	↓	7A	51	↓	↓	9:55	1	↓	8	↓	16:00	10808	30	00C
Check Source	N/A	36	Th	N/A	↓	↓	↓	↓	↓	11/10/09	17:00	9372	1	00C
↓	↓	2B	↓	↓	↓	↓	↓	↓	↓	↓	17:01	9516	↓	00C
↓	↓	6C	↓	↓	↓	↓	↓	↓	↓	↓	18:33	9437	↓	8
↓	↓	SD	↓	↓	↓	↓	↓	↓	↓	↓	18:36	9396	↓	8
↓	↓	IF	↓	↓	↓	↓	↓	↓	↓	↓	17:06	9378	↓	00C
↓	↓	7A	↓	↓	↓	↓	↓	↓	↓	↓	17:02	9595	↓	00C
Check Source	N/A	3E	Th	N/A	↓	↓	↓	↓	↓	11/18/09	11:11	9215	1	8
↓	↓	2B	↓	↓	↓	↓	↓	↓	↓	↓	11:12	9399	↓	8
↓	↓	6C	↓	↓	↓	↓	↓	↓	↓	↓	11:14	9381	↓	8
↓	↓	SD	↓	↓	↓	↓	↓	↓	↓	↓	11:16	9515	↓	8
↓	↓	IF	↓	↓	↓	↓	↓	↓	↓	↓	11:17	9516	↓	8
↓	↓	7A	↓	↓	↓	↓	↓	↓	↓	↓	11:18	9437	↓	8
08116503-ICV1	N/A	3E	1	N/A	11/18/09	11:20	12	15	8	↓	17:28	363	15	8
↓	↓	2B	2	↓	↓	↓	23	↓	8	↓	↓	1625	↓	8
↓	↓	3E	2	↓	↓	11:37	18	↓	8	↓	17:44	773	↓	8
↓	↓	2B	1	↓	↓	↓	25	↓	8	↓	↓	1184	↓	8
↓	↓	6C	20	↓	↓	11:20	36	↓	8	↓	17:28	1246	↓	8
↓	↓	SD	21	↓	↓	↓	50	↓	8	↓	↓	598	↓	8
↓	↓	6C	21	↓	↓	11:37	53	↓	8	↓	17:44	1130	↓	8

Comments: 6/1/09

Form 795r3.xls (11/14/05)

370036

Reviewed by/date: 8/1/09

370037

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Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count			Sample Count		
					Start		Dur. (min.)	Start		Dur. (min.)
					Date	Time		Date	Time	
0816503-ICV43	N4	5D	20	N/A	1/18/09	11:37	15	1/18/09	17:44	15
-ICV5		1F	41			11:20			17:28	
-ICV6		7A	42			↓			↓	
-ICV6		1F	42			11:37			17:44	
-ICV5		7A	41			↓			↓	
-ICV7		3E	3			11:54			18:01	
-ICV8		2B	4			↓			↓	
-ICV6		3E	4			12:11			18:18	
-ICV7		2B	3			↓			↓	
-ICV9		6C	22			11:54			18:01	
-ICV10		5D	23			↓			↓	
-ICV10		6C	23			12:11			18:18	
-ICV9		5D	22			↓			↓	
-ICV11		1F	43			11:54			18:01	
-ICV12		7A	44			↓			↓	
-ICV12		1F	44			12:11			18:18	
-ICV11		7A	43			↓			↓	
-ICV13		3E	6			12:27			18:40	
-ICV14		2B	8			↓			↓	
-ICV14		3E	8			12:45			18:59	
-ICV13		2B	6			↓			↓	
-ICV15		6C	24			12:27			18:40	
-ICV10		5D	25			↓			↓	

Comments:

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Form 7953.xls (11/14/05)

370037

Reviewed by/date:

1/18/09

370038

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start Date	Time	Counts	Dur. (min.)	Pos. Chk.
					Date	Time								
0216503-ICV16	N A	6C	25	N/A	11/18/09	12:45	96	15	8	11/18/09	18:59	2282	15	8
-ICV15		5D	24			↓	74		8	11/18/09	19:59	2722		8
-ICV17		1F	45			12:27	48		8		18:40	1324		8
-ICV18		7A	46			↓	37		8		↓	1677		8
-ICV18		1F	46			12:45	34		8		18:59	1638		8
-ICV17		7A	45			↓	60		8		↓	1345		8
-ICV19		3E	9			13:01	13		8		19:16	1345		8
-ICV20		2B	10			↓	1165		8		↓	594		8
-ICV20		3E	10			13:28	37410		8		19:38	655		8
-ICV19		2B	9			↓	37		8		↓	1454		8
-ICV21		6C	26			13:01	67		8		19:16	1590		8
-ICV22		5D	27			↓	61		8		↓	1359		8
-ICV22		6C	27			13:28	92		8		19:38	1879		8
-ICV21		5D	26			↓	76		8		↓	1600		8
-ICV23		1F	47			13:01	42		8		19:16	1760		8
-ICV24		7A	49			↓	5		8		↓	1331		8
-ICV24		1F	49			13:28	25		8		19:38	1724		8
-ICV23		7A	47			↓	34		8		↓	1639		8
-ICV25		3E	12			13:47	1672		8		19:57	825		8
-ICV26		2B	14			↓	23		8		↓	1971		8
-ICV26		3E	14			14:03	16		8		20:15	349		8
-ICV25		2B	12			↓	3310		8		↓	1771		8
-ICV27	V	6C	28	V	V	13:47	2991	V	8		19:57	2282	V	8

Comments:

370038

Form 795r3.xls (11/14/05)

Reviewed by/date:

8/11/09

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
0816503-ICV28	N/A	SD	29	N/A	11/18/09	13:47	3865	15	8	11/18/09	19:57	1469	15	8
-ICV28		6C	29			14:03	3804		8		20:15	1442		8
-ICV27		SD	28			↓	2905		8		↓	2292		8
-ICV29		IF	50			13:47	6		8		19:57	1060		8
-ICV30		7A	51			↓	29		8		↓	1587		8
-ICV30		IF	51			14:03	21		8		20:15	1483		8
-ICV29		7A	50			↓	5		8		↓	1105		8
-ICV31		6C	30			14:20	43		8		20:31	1504		8
-ICV32		SD	31			↓	34		8		↓	1281		8
-ICV32		6C	31			14:37	34		8		20:47	1286		8
✓ -ICV31	✓	SD	30	✓	↓	↓	3344	↓	8		↓	1400	↓	8
Check Source	N/A	3E	Th	N/A					→		20:39	9194	1	8
		2B							→		20:41	9749	1	8
		6C							→		20:43	9487	1	8
		SD							→		21:07	9492	1	8
		IF							→		20:43	9470	1	8
✓	✓	7A		✓					→	✓	20:44	9564	1	8
N/A									→					8
Check Source	N/A	3E	Th	N/A					→	11/19/09	753	9340	1	8
		2B							→		755	9623	1	8
		6C							→		756	9405	1	8
		SD							→		757	9647	1	8
✓	✓	IF		✓					→	✓	759	9444	1	8

Comments:

370044

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count							
					Start		Counts	Dur. (min.)	Pos.	Chk.	Start		Counts	Dur. (min.)	Pos.	Chk.
					Date	Time					Date	Time				
Check Source	N/A	3E	Th	N/A						1/23/09	1444	9108	1	S		
		ZB									1450	9605		S		
		6C									1445	9554		S		
		SD									1446	9574		S		
		IF									1448	9424		S		
		7A									1449	9753		S		
Check Source	N/A	3E	Th	N/A						1/26/09	810	9160	1	S		
		ZB									811	9334		S		
		6C									813	9699		S		
		SD									815	9509		S		
		IF									816	9446		S		
		7A									818	9462		S		
OB12209-3dup	RE090109-2	3E	8	4	1/26/09	8:24	1148	12	15		1540	21	15	S		
-4		ZB	14				8					62		S		
-5		6C	30				5					46		S		
-6		SD	22	5			10					58		S		
-6dup		IF	46	4			2					31		S		
OB12103-1	RE090105-2	7A	47				3					9		S		
-2		ZB	3	5			847				1559	24		S		
RE090105-2MB	RE090105-2	6C	24				4					6		S		
-2LCS		IF	49	4			1					1918		S		
-2LCS		7A	50				1					1700		S		
RE090102-1LCS	RE090102-1	ZB	6	5			11				1617	788		S		

Comments:

370044

Form 795r3.xls (11/14/05)

Reviewed by/date: 8/1/27/09

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count			
					Start		Dur. (min.)	Pos. Chk.	Start		Dur. (min.)	Pos. Chk.
					Date	Time			Date	Time		
0812105-1	RED90102-1	IF	42	5	11/26/09	944	0	15	11/26/09	17:05	76	15
- dup	↓	7A	44	↓	↓	↓	1	↓	↓	↓	93	↓
081210503-ICV33	N/A	6C	20	N/A	11/26/09	944	9	30	1731	1731	1677	30
-ICV34	↓	5D	21	↓	↓	↓	11	↓	↓	↓	4529	↓
-ICV34	↓	6C	21	↓	10:17	10:17	11	↓	10:03	10:03	2576	↓
-ICV33	↓	5D	20	↓	↓	↓	19	↓	↓	↓	449	↓
-ICV35	↓	3E	10	↓	10:15	10:15	15	↓	1731	1731	3058	↓
-ICV36	↓	2B	12	↓	↓	↓	19	↓	↓	↓	2832	↓
-ICV36	↓	3E	12	↓	10:54	10:54	14	↓	18:03	18:03	2835	↓
-ICV35	↓	2B	10	↓	↓	↓	17	↓	↓	↓	3091	↓
Check Source	N/A	3E	Th	N/A	↓	↓	↓	↓	18:35	18:35	9246	↓
↓	↓	2B	↓	↓	↓	↓	↓	↓	18:37	18:37	9403	↓
↓	↓	6C	↓	↓	↓	↓	↓	↓	18:38	18:38	9373	↓
↓	↓	5D	↓	↓	↓	↓	↓	↓	18:40	18:40	9399	↓
↓	↓	7A	↓	↓	↓	↓	↓	↓	17:50	17:50	9342	↓
Check Source	N/A	3E	Th	N/A	↓	↓	↓	↓	18:01	18:01	9326	↓
↓	↓	2B	↓	↓	11/27/09	936	9289	1	11/27/09	936	9289	1
↓	↓	6C	↓	↓	↓	↓	↓	↓	938	938	9476	↓
↓	↓	5D	↓	↓	↓	↓	↓	↓	939	939	9501	↓
↓	↓	IF	↓	↓	↓	↓	↓	↓	940	940	9592	↓
↓	↓	7A	↓	↓	↓	↓	↓	↓	943	943	9298	↓
N/A - 8/12/7	↓	7A	↓	↓	↓	↓	↓	↓	945	945	9520	↓

Comments:

370046

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count				Sample Count					
					Start		Counts	Dur. (min.)	Pos. Chk.	Start		Counts	Dur. (min.)	Pos. Chk.
					Date	Time				Date	Time			
0812103 - 3	RE096105-2	3E	8	5	1/27/09	948	4	1/27/09	1500	15	6			
-4		2B	14	↓			13				6			
-5		6C	4630	↓			6				6			
-6		SD	1034722	6			14				6			
6 11627		IF	46	5			1				6			
-8		7A	47	↓			2				6			
-9		3E	3	6			7				6			
-10		2B	6	↓		10:10	17		15:31		6			
-11		6C	24	6			9				6			
-12		IF	49	5			12				6			
-13		7A	50	↓			8				6			
-14		2B	10	1		10:27	19		15:49		6			
-15		IF	42	6			5				6			
-16		7A	44	6			6				6			
-17		2B	12	1		10:57	15		16:19		6			
0816503 - 137	N/A	6C	28	N/A		10:27	9		15:49		6			
-138		SD	29	↓			12				6			
-139		6C	29	↓			8		16:19		6			
-140		SD	28	↓		10:57	7				6			
Check Source	N/A	3E	TR	N/A					17:15		6			
		2B	↓	↓					17:18		6			
		6C	↓	↓					17:20		6			
		6D	↓	↓					17:23		6			

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Comments:

Form 795r3.xls (11/14/05)

370046

Reviewed by/date:

8/1/27/09

370047

Logbook No./Page

Paragon Analytics

Sample ID	Batch ID	Scalar / Detector ID	Flask ID	Run # of 20	Background Count			Sample Count		
					Start		Dur. (min.)	Counts	Dur. (min.)	Pos. Chk.
					Date	Time				
check source	N/A	1F	Th	N/A				1724	9396	1
	↓	7A	↓	↓				1928	9583	↓
check source	N/A	3E	Th	N/A				1/20/09	9228	1
	↓	2B	↓	↓				756	9724	↓
	↓	6C	↓	↓				757	9472	↓
	↓	5D	↓	↓				759	9527	↓
	↓	1F	↓	↓				800	9613	↓
	↓	7A	↓	↓				801	9356	↓
0812103-18	RE090105-2	3E	8	6	1/28/09	803	15	15:42	10	15
↓	↓	2B	14	↓				↓	6	↓
-19	↓	6C	30	↓					7	↓
RE090105-1	RE090105-1	5D	22	7					7	↓
↓	↓	1F	44	6					1077	↓
-145	↓	7A	47	↓				↓	905	↓
0812078-1		3E	3	7				15:42	10	↓
-2	↓	2B	6	↓					20	↓
-3	↓	6C	24	7					7	↓
-4	↓	5D	28	1					14	↓
-5	↓	1F	49	6					8	↓
-6	↓	7A	50	↓				↓	10	↓
-7	↓	2B	10	2				1559	91	↓
-8	↓	1F	42	7				↓	56	↓
-9	↓	7A	44	↓					16	↓

Comments:

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Form 795r3.xls (11/14/05)

Reviewed by/date:

8/1/29/09

Prepare a working dilution of 818.3020.31 to a final concentration of approximately 100 dpm/mL.

1) Determine density of 1M HCl: (Lot # 063537)

(Bal 12)

Mass of empty 100 mL Class A flask: 62.4699 g

Mass of 100 mL Class A flask + 100 mL 1M HCl: 163.9106 g

Net mass of 1M HCl: 101.4407

$\div 100 = \text{density} = 1.0144 \text{ g/mL}$

2) Transfer std to 1 L Nalgene bottle:

(Bal 12)

Mass of bottle (w/o std): 74.2161 g

Mass of bottle + std: 79.4285 g

Net mass of std. transferred: 5.4124 g

3) Dilute w 1M HCl

(Bal 26)

Mass of bottle + std + 1M HCl: 1087.3 g

Mass of bottle (from above): 74.2161 g

Net mass of std: 1013.0839 g

4) Final Activity Calculation:

$$\frac{5.4124 \text{ g} \times 18451.8 \text{ dpm/g} \times 1.0144 \text{ g/mL}}{1013.0839 \text{ g}} = 99.998 \text{ dpm/mL}$$

5) Std. transferred to Marinelli beaker for verification by γ -Spec

Std ID: 818.3020.76

RG 5/15/07

Description: Ra-226

Expiration: 5/3/2008

Activity: 100.00 dpm/mL

2s Uncertainty: 1.20 dpm/mL

Ref. Date: 9/1/2003

Ref Time: N/A

Prep Date: 4/30/2007 Prep by: KB

Matrix/Comp. 1M HCl

Half Life (y): 1.60E+03

Reverification Log

Analysis Date Initials Expiration Date

RG 5/15/07
Continued on Page

Kruptal Brown

Signed

4/25/07

Date

Bene Haller

Signed

5/15/07

Date

Read and Understood By

U.S. Department of Commerce
National Institute of Standards
and Technology
SRM 4967A
Radium-226

<15 kBq in 4% hydrochloric acid

CAUTION
RADIOACTIVE
MATERIAL



Prepare a primary dilution of RSO
#818 (NIST 4967A) by diluting the
entire stock solution to approx 40 ml
w/ 1M HCl

1) Prepared 2L HCl in 1M solution by
diluting 166 mL conc HCl, Fischer
Lot # 060506, in 2L DI water.

2) Determine density of 1M HCl

Mass of 100 ml volumetric flask = 56.4422 g (Bal 12)
Mass of flask + acid = 157.6815 g ↓
Net mass of 1M HCl = 101.2393 g
÷ 100 ml = density of 1M HCl = 1.0124 g/ml.

3) Transfer contents of ampoule to 40 ml VOA vial

Mass of VOA vial = 24.9938 g (Bal 12)
Mass of vial + std = 29.9415 g ↓
Net mass of std transferred = 4.9477 g

4) Dilute w/ 1M HCl

Mass of vial + std + HCl = 64.9255 g Bal 12
Mass of vial (from above) = 24.9938 g
Net mass of primary std. = 39.9317 g

5) Final Activity Calculation

$$\frac{(2482 \text{ Bq/g}) (4.9477 \text{ g}) (60 \text{ Bq/dpm})}{(39.9317 \text{ g})} = 18,451.8 \text{ dpm/g}$$

Ref date 9/1/03

Continued on Page

Read and Understood By

David C. Burr

Signed

5/10/06

Date

Renee Holcomb

Signed

5/18/06

Date



RSO #818 Rec'd 5/8/06
National Institute of Standards & Technology

Certificate

Standard Reference Material 4967A Radium-226 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive radium-226 chloride (and its radioactive decay products), non-radioactive barium chloride and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of instruments and for the monitoring of radiochemical procedures.

Radiological Hazard: The SRM ampoule contains radium-226 with an activity of approximately 13 kBq. Radium-226 decays by alpha-particle emission. The progeny of radium-226 have a total activity of approximately 95 kBq and decay by alpha- and beta-particle emission. None of the alpha or beta particles escape from the SRM ampoule. During the decay process, X-rays and gamma rays with energies from 11 keV to 2.5 MeV are also emitted. Most of these photons escape from the SRM ampoule and can represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. Gaseous radon-222 will escape from the ampoule when it is opened. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard: The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 1.0 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling: The SRM should be stored and used at a temperature between 5 °C and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least September 2013. The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of both the radioactivity and the strong acid.

Preparation: This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, M.P. Unterwiesing, Acting Group Leader. The overall technical direction and physical measurements leading to certification were provided by R. Collé and P. Volkovitsky of the Radioactivity Group. Statistical consultation was provided by S.D. Leigh of the NIST Statistical Engineering Division. The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program.

Lisa R. Karam, Acting Chief
Ionizing Radiation Division

Gaithersburg, Maryland 20899
December 2004

Robert L. Watters, Jr., Chief
Measurement Services Division

Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution usually contains strong acid or base and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle. NEVER PIPETTE BY MOUTH.
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]*.

PROPERTIES OF SRM 4967A

Certified values

Radionuclide	Radium-226
Reference time	1200 EST, 01 September 2003
Massic activity of the solution [b]*	2482 Bq·g ⁻¹
Relative expanded uncertainty (k=2)	1.20% [c] [d]
Solution mass	(5.086 ± 0.003) g [e]
Solution density	(1.017 ± 0.002) g·mL ⁻¹ at 21 °C [e]

Uncertified values

Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L ⁻¹)	Mass Fraction (g·g ⁻¹)
	H ₂ O	54	0.96
	HCl	1.0	0.04
	BaCl ₂	4 × 10 ⁻⁴	8 × 10 ⁻⁵
	²²⁶ RaCl ₂	3 × 10 ⁻⁷	9 × 10 ⁻⁸
Radiological Properties:			
Photon-emitting impurities	None detected [f]		
Half lives used	Radium-226: (1600 ± 7) a [g] [5] Radon-222: (3.8235 ± 0.0003) d [g] [5]		
Calibration method and measuring instrument(s)	Gravimetric dilution of SRM 4963, confirmed by comparison with solution standards, and derivatives thereof, from the NBS/NIST "1947 (1967 recalibrated) series" of radium-226 solution standards. The mass of radium-226 in these solution standards had previously been determined by comparison with the U.S. National Standards for radium-226. Conversion from mass of radium-226 to activity of radium-226 was done using the half life of radium-226 shown above. [h]		

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ACTIVITY [c] [d]*

Input Quantity x_i , the source of uncertainty (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$, the standard uncertainty of x_i (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$, (%) [i]	Relative Sensitivity Factor, $|\partial y/\partial x_i| \cdot$ (x_i/y) [j]	Relative Uncertainty Of Output Quantity, $u_i(y)/y$, (%) [k]
Calibration of the "1947 (1967 recalibrated) series" of radium-226 solution standards in terms of mass of radium- 226 [h]	Estimated (B)	0.34	1.0	0.34
Ratio of the mass of radium-226 in SRM 4967A to the mass of radium-226 in the "1947 (1967 recalibrated) series" of radium-226 solution standards	Weighted mean of the ratios obtained using seven different comparisons (B)	0.15	1.0	0.15
Corrections for the decay of radium-226	Standard uncertainty of the radium-226 half-life (A) [m]	0.44	0.016 [n]	0.007
Gravimetric measurements	Estimated (B)	0.10	1.0	0.10
Conversion of radium- 226 mass to activity [p]	Standard uncertainty of the radium-226 half-life (A) [q]	0.44	1.0	0.44
Photon-emitting impurities	Limit of detection (B) [r]	100.	0.0001	0.01
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$, (%)				0.6
Coverage Factor, k				<u>x 2</u>
Relative Expanded Uncertainty of the Output Quantity, U/y , (%)				1.2

NOTES

- [a] The Sievert is the SI unit for dose equivalent. See reference [1]. One μSv is equal to 0.1 mrem.
- | | | | |
|---|---|-----|-----|
| Distance from Ampoule (cm): | 1 | 10 | 100 |
| Approximate Dose Rate ($\mu\text{Sv/h}$): | 5 | 0.4 | - |
- [b] **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [c] The reported value, y , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \dots, x_n)$, where f is a mathematical function derived from the assumed model of the measurement process. The value, x_i , used for each input quantity i has a **standard uncertainty**, $u(x_i)$, that generates a corresponding uncertainty in y , $u_i(y) = |\partial y / \partial x_i| \cdot u(x_i)$, called a **component of combined standard uncertainty** of y . The **combined standard uncertainty** of y , $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty. The combined standard uncertainty is multiplied by a **coverage factor** of $k=2$ to obtain U , the **expanded uncertainty** of y .
- Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ with a level of confidence of approximately 95 percent.
- For further information on the expression of uncertainties, see references [2] and [3].
- [d] The value of each component of combined standard uncertainty, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic response is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval $U/2$ to $2U$ (i.e., within a factor of 2 of the estimated value).
- [e] The stated uncertainty is two times the standard uncertainty.
- [f] Estimated limits of detection for photon-emitting impurities, as of the reference time, expressed as massic photon emission rates, are:
- $6 \times 10^0 \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 22 and 182 keV,
 - $3 \times 10^0 \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 190 and 347 keV,
 - $8 \times 10^{-1} \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 356 and 1455 keV, and
 - $3 \times 10^{-1} \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 1465 and 2750 keV,
- provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of radium-226 and progeny.
- [g] The stated uncertainty is the standard uncertainty.

- [h] For further details on NBS/NIST radium series calibrations refer to reference [6]. The 1967 recalibrations of the "1947 series" and of the "1957 series" were made using pressurized "4 π " γ ionization chamber (PIC) "A".

The master solution for SRM 4967A was directly compared with the "1947 (1967 recalibrated) series" of radium-226 solution standards using PIC "A", and was compared with solutions of the "1992 series" of radium solution standards (SRM 4967) using PIC "A", pulse-ionization-chamber radon analyses (see references [7] and [8]), and germanium photon spectrometry.

The radium-226 in SRM 4967A was chemically purified approximately 55 years ago. The lead-210 and its daughter radionuclides are not in equilibrium.

- [i] Relative standard uncertainty of the input quantity x_i .
- [j] The relative change in the output quantity y divided by the relative change in the input quantity x_i . If $|\partial y / \partial x_i| \cdot (x_i / y) = 1.0$, then a 1% change in x_i results in a 1% change in y . If $|\partial y / \partial x_i| \cdot (x_i / y) = 0.05$, then a 1% change in x_i results in a 0.05% change in y .
- [k] Relative component of combined standard uncertainty of output quantity y , rounded to two significant figures or less. The relative component of combined standard uncertainty of y is given by $u_i(y)/y \approx |\partial y / \partial x_i| \cdot u(x_i)/y = |\partial y / \partial x_i| \cdot (x_i / y) \cdot u(x_i)/x_i$. The numerical values of $u(x_i)/x_i$, $|\partial y / \partial x_i| \cdot (x_i / y)$, and $u_i(y)/y$, all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.
- [m] The relative standard uncertainty of $\lambda \cdot t$ is determined by the relative standard uncertainty of λ (i.e., of the half life). The relative standard uncertainty of t is negligible.
- [n] $|\partial y / \partial x_i| \cdot (x_i / y) = |\lambda \cdot t|$
- [p] The U.S. National Standards for radium-226 are certified in terms of mass of radium-226, as were all radium-226 SRMs prior to the "1992 series". Beginning with the "1992 series", radium-226 solution SRMs are now certified in terms of the massic activity of radium-226.
- [q] The relative standard uncertainty of the activity of radium-226 per unit mass of radium-226 is determined by the relative standard uncertainty of λ (i.e., of the half life). The relative standard uncertainties of the atomic weight of radium-226 and of Avogadro's number are negligible.
- [r] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e. $u(x_i)/x_i = 100\%$. $|\partial y / \partial x_i| \cdot (x_i / y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Ra-226})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Ra-226})\}$. Thus $u_i(y)/y$ is the relative change in y if the impurity were present with a massic activity equal to the estimated limit of detection.

REFERENCES

- [1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from Global Engineering Documents, 12 Inverness Way East, Englewood, CO 80112, U.S.A. Telephone 1-800-854-7179.
- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993 (corrected and reprinted, 1995). Available from Global Engineering Documents, 12 Inverness Way East, Englewood, CO 80112, U.S.A. Telephone 1-800-854-7179.
- [3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.
- [4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.
- [5] Evaluated Nuclear Structure Data File (ENSDF), September 2003.
- [6] W.B. Mann, L.L. Stockman, W.J. Youden, A. Schwebel, P.A. Mullen and S.B. Garfinkel, Preparation of New Solution Standards of Radium, *Journal of Research of the National Bureau of Standards* **62** (1959) 21-26.
- [7] R. Collé, J.M.R. Hutchinson and M.P. Unterweger, The NIST Primary Radon-222 Measurement System, *Journal of Research of the National Institute of Standards and Technology* **95** (1990) 155-165.
- [8] J.M.R. Hutchinson, J. Cessna, R. Collé and P. Hodge, An International Radon-In-Air Measurement Intercomparison Using a New Transfer Standard, *Applied Radiation and Isotopes* **43** (1992) 175-189.

Ra-226 Standard Verification: For Use In Ra-Sr Lab

Std: 818.3020.76
Date 5/3/2007

Known Act.: 1666.633 dps 45044.1 pCi/L

	Det	Act. (pCi/L)	Act. (pCi/mL)	Ave Act	2 Std Dev	% Recovery	Ave Rec w/in 5% (PAI)	2 Std Dev w/in 10% Ave (ICPT)
Count 1	3	45100	45.1			100.1%	101.8%	0.034
Count 2	8	45500	45.5			101.0%	Pass	Pass
Count 3	9	46900	46.9	45833.3	1543.4	104.1%		

r:\inst\gamma\302076Ra226

PG
5/15/07

070567D03.SPC Analyzed by *PR*

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0716004-1 RA-226 STD VER

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Sampling Start: 09/01/2003 10:00:00 | Counting Start: 05/03/2007 09:22:07
Sampling Stop: 09/01/2003 10:00:00 | Decay Time. . . . . 3.22E+004 Hrs
Buildup Time. . . . . 0.00E+000 Hrs | Live Time . . . . . 7200 Sec
Sample Size . . . . . 1.00E+000 L | Real Time . . . . . 7287 Sec
Collection Efficiency . . . . . 1.0000 | Spc. File . . . . . 070567D03.SPC
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Detector #: 3 (Detector 3)

Energy(keV) = -1.25 + 0.501*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/03/2007

FWHM(keV) = 0.67 + 0.021*En + 6.56E-04*En^2 + 0.00E+00*En^3 01/06/2007

Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	45.91	94.19	473	210	169	4866	1.18	a
2	47.87	98.09	26	112	92	2086	0.43	b NET< CL
3	52.70	107.75	244	159	128	3328	0.86	a
4	74.38	151.03	4977	219	138	3849	0.90	a HiResid Wide Pk
5	76.87	156.02	7566	259	158	4619	0.93	b HiResid
6	79.36	160.98	23	192	158	4619	0.93	c NET< CL HiResid
7	80.87	164.00	0	192	158	4619	0.92	d NET< CL HiResid
8	83.87	170.00	2	192	158	4619	0.92	e NET< CL HiResid
9	86.89	176.03	2792	219	158	4619	0.92	f HiResid
10	89.87	181.97	454	197	158	4619	0.93	g HiResid
11	94.88	191.98	-0	192	158	4619	0.99	h NET< CL HiResid
12	99.17	200.55	-0	1312	1079	42341	9.03	i NET< CL HiResid
13	101.42	205.05	23	192	158	4619	0.92	j NET< CL HiResid
14	186.17	374.30	11076	291	165	4646	1.14	a
15	224.52	450.89	70	132	108	2343	0.90	a NET< CL
16	241.98	485.75	9658	251	129	2835	1.20	a
17	258.94	519.63	635	133	101	2147	1.06	a

Page 001

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
18	274.68	551.06	443	151	119	2632	1.27	a
19	285.49	572.66	85	129	105	2186	1.14	a NET< CL
20	295.21	592.06	21510	324	114	2381	1.30	a
21	349.70	700.88	609	211	168	3490	2.63	a Wide Pk
22	351.87	705.22	35484	395	97	1745	1.33	b
23	386.87	775.12	170	86	67	1028	0.80	a
24	389.08	779.53	290	99	76	1234	1.02	b
25	454.44	910.06	313	113	88	1268	1.70	a
26	460.96	923.09	100	76	60	761	0.94	b
27	462.35	925.87	131	76	60	761	1.01	c
28	469.85	940.84	100	89	71	943	1.29	a
29	474.29	949.71	103	113	91	1297	1.81	b
30	480.39	961.89	249	108	85	1179	1.60	c
31	486.99	975.07	264	108	85	1179	1.72	d
32	498.62	998.30	45	67	54	609	0.90	a NET< CL
33	510.97	1022.96	487	148	117	1672	2.64	a Wide Pk
34	533.76	1068.47	92	66	52	614	0.93	a
35	572.84	1146.52	40	53	43	448	0.78	a NET< CL
36	580.13	1161.09	246	84	64	792	1.40	a
37	609.32	1219.38	26717	337	66	809	1.65	a HiResid
38	632.86	1266.39	48	57	45	445	1.18	a
39	665.49	1331.56	745	90	58	632	1.59	a
40	675.53	1351.61	47	59	47	454	1.26	a NET< CL
41	703.17	1406.81	276	112	88	1069	2.73	a Wide Pk
42	719.87	1440.15	259	76	57	591	1.71	a
43	751.89	1504.11	24	76	62	638	1.93	a NET< CL
44	768.49	1537.26	2326	122	62	668	1.81	a HiResid
45	786.18	1572.59	560	93	66	696	2.14	a
46	806.27	1612.71	571	85	58	592	1.88	a
47	838.94	1677.94	300	78	57	636	1.85	a
48	934.15	1868.10	1235	101	60	660	1.96	a
49	964.64	1929.00	142	72	56	580	2.04	a
50	1052.21	2103.87	112	65	51	478	1.99	a
51	1069.88	2139.16	114	74	58	553	2.40	a
52	1120.39	2240.04	5518	163	56	536	2.27	a
53	1134.01	2267.25	68	73	58	556	2.39	a
54	1155.40	2309.96	592	83	55	523	2.26	a
55	1183.12	2365.33	51	54	43	349	1.87	a
56	1208.06	2415.13	151	73	57	507	2.62	a
57	1238.27	2475.46	1912	107	50	415	2.39	a
58	1281.17	2561.14	452	73	49	410	2.28	a
59	1377.77	2754.07	1383	96	50	397	2.54	a
60	1385.34	2769.18	269	72	53	422	2.79	b
61	1401.64	2801.73	374	71	49	400	2.51	a
62	1408.39	2815.20	729	81	49	400	2.49	b
63	1509.32	3016.78	607	83	55	469	2.73	a
64	1538.72	3075.49	153	62	47	365	2.45	a
65	1543.29	3084.63	150	68	52	414	2.78	b
66	1583.64	3165.21	190	67	50	383	2.72	a

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
67	1594.84	3187.56	41	43	33	225	1.68	b
68	1661.62	3320.95	293	51	31	160	2.42	a
69	1684.55	3366.73	26	27	21	95	1.34	a
70	1729.72	3456.94	781	69	33	164	2.72	a
71	1764.61	3526.62	4057	134	33	157	3.12	a HiResid
72	1847.66	3692.48	538	61	33	152	3.22	a
73	1874.41	3745.90	39	24	17	58	1.42	a

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070567D03.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET030427.BKG (WEEKLY BKG 070427-3)

Bkg.File Detector #: 3

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
3	52.70	244	159	129	240	160	129	
8	83.87	2	192	158	-5	193	159	NET<CL
9	86.89	2792	219	158	2787	220	158	
14	186.17	11076	291	165	11042	291	166	
20	295.21	21510	324	114	21497	325	114	
22	351.87	35484	395	97	35462	395	98	
33	510.97	487	148	117	303	151	121	
37	609.32	26717	337	66	26708	337	68	

070567D03.SPC Analyzed by

SEEKER FINAL ACTIVITY REPORT Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0716004-1 RA-226 STD VER

Sampling Start: 09/01/2003 10:00:00 | Counting Start: 05/03/2007 09:22:07
Sampling Stop: 09/01/2003 10:00:00 | Decay Time. 3.22e+004 Hrs
Buildup Time. 0.00e+000 Hrs | Live Time 7200 Sec
Sample Size 1.00e+000 L | Real Time 7287 Sec
Collection Efficiency 1.0000 | Spectrum File 070567D03.SPC
Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 3 (Detector 3)

Efficiency File: (D03)(Sh01).EFF (Geo 1 Eff Cal)

Eff.=1/[2.99E-03*En^-3.90E+00 + 1.44E+02*En^8.10E-01] 01/07/2007

Library File: . RA-226(186 KEV).LIB (Ra-226 std ver. (186 keV))
=====

MEASURED or MDA CONCENTRATIONS

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N						
Nuclide	ENERGY E (keV)	Concentration T (pCi/L)		MDA	Critical Level	Halflife (hrs)
Ra-226	186.21	4.51E+04 +- 1.19E+03		1.37E+03	6.79E+02	1.40E+07

MEASURED TOTAL: 4.51E+04 +- 1.19E+03 pCi/L

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UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	45.91	94.19	473	210	169	4866	1.18	1070DEsc
2	47.87	98.09	26	112	92	2086	0.43	Deleted
3	52.70	107.75	240	160	129	3328	0.86	Unknown
4	74.38	151.03	4977	219	138	3849	0.90	Unknown
5	76.87	156.02	7566	259	158	4619	0.93	Unknown
6	79.36	160.98	23	192	158	4619	0.93	Deleted
7	80.87	164.00	0	192	158	4619	0.92	Deleted
8	83.87	170.00	-5	193	159	4619	0.92	Deleted
9	86.89	176.03	2787	220	158	4619	0.92	Unknown
10	89.87	181.97	454	197	158	4619	0.93	Unknown
11	94.88	191.98	0	192	158	4619	0.99	Deleted
12	99.17	200.55	0	1312	1079	42341	9.03	Deleted
13	101.42	205.05	23	192	158	4619	0.92	Deleted
15	224.52	450.89	70	132	108	2343	0.90	Deleted
16	241.98	485.75	9658	251	129	2835	1.20	Unknown

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UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.I. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
17	258.94	519.63	635	133	101	2147	1.06	1281DEsc
18	274.68	551.06	443	151	119	2632	1.27	Unknown
19	285.49	572.66	85	129	105	2186	1.14	Deleted
20	295.21	592.06	21497	325	114	2381	1.30	Unknown
21	349.70	700.88	609	211	168	3490	2.63	Unknown
22	351.87	705.22	35462	395	98	1745	1.33	Unknown
23	386.87	775.12	170	86	67	1028	0.80	1408DEsc
24	389.08	779.53	290	99	76	1234	1.02	Unknown
25	454.44	910.06	313	113	88	1268	1.70	Unknown
26	460.96	923.09	100	76	60	761	0.94	Unknown
27	462.35	925.87	131	76	60	761	1.01	Unknown
28	469.85	940.84	100	89	71	943	1.29	Unknown
29	474.29	949.71	103	113	91	1297	1.81	Unknown
30	480.39	961.89	249	108	85	1179	1.60	Unknown
31	486.99	975.07	264	108	85	1179	1.72	1509DEsc
32	498.62	998.30	45	67	54	609	0.90	Deleted
33	510.97	1022.96	303	151	121	1672	2.64	Unknown
34	533.76	1068.47	92	66	52	614	0.93	Unknown
35	572.84	1146.52	40	53	43	448	0.78	Deleted
36	580.13	1161.09	246	84	64	792	1.40	Unknown
37	609.32	1219.38	26708	337	68	809	1.65	1120SEsc
38	632.86	1266.39	48	57	45	445	1.18	Unknown
39	665.49	1331.56	745	90	58	632	1.59	Unknown
40	675.53	1351.61	47	59	47	454	1.26	Deleted
41	703.17	1406.81	276	112	88	1069	2.73	Unknown
42	719.87	1440.15	259	76	57	591	1.71	Unknown
43	751.89	1504.11	24	76	62	638	1.93	Deleted
44	768.49	1537.26	2326	122	62	668	1.81	1281SEsc
45	786.18	1572.59	560	93	66	696	2.14	Unknown
46	806.27	1612.71	571	85	58	592	1.88	Unknown
47	838.94	1677.94	300	78	57	636	1.85	Unknown
48	934.15	1868.10	1235	101	60	660	1.96	Unknown
49	964.64	1929.00	142	72	56	580	2.04	Unknown
50	1052.21	2103.87	112	65	51	478	1.99	Unknown
51	1069.88	2139.16	114	74	58	553	2.40	Unknown
52	1120.39	2240.04	5518	163	56	536	2.27	Unknown
53	1134.01	2267.25	68	73	58	556	2.39	Unknown
54	1155.40	2309.96	592	83	55	523	2.26	Unknown
55	1183.12	2365.33	51	54	43	349	1.87	Unknown
56	1208.06	2415.13	151	73	57	507	2.62	Unknown
57	1238.27	2475.46	1912	107	50	415	2.39	Unknown
58	1281.17	2561.14	452	73	49	410	2.28	Unknown
59	1377.77	2754.07	1383	96	50	397	2.54	Unknown
60	1385.34	2769.18	269	72	53	422	2.79	Unknown
61	1401.64	2801.73	374	71	49	400	2.51	Unknown
62	1408.39	2815.20	729	81	49	400	2.49	Unknown
63	1509.32	3016.78	607	83	55	469	2.73	Unknown
64	1538.72	3075.49	153	62	47	365	2.45	Unknown
65	1543.29	3084.63	150	68	52	414	2.78	Unknown

070567D03.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
66	1583.64	3165.21	190	67	50	383	2.72	Unknown
67	1594.84	3187.56	41	43	33	225	1.68	Unknown
68	1661.62	3320.95	293	51	31	160	2.42	Unknown
69	1684.55	3366.73	26	27	21	95	1.34	Unknown
70	1729.72	3456.94	781	69	33	164	2.72	Unknown
71	1764.61	3526.62	4057	134	33	157	3.12	Unknown
72	1847.66	3692.48	538	61	33	152	3.22	Unknown
73	1874.41	3745.90	39	24	17	58	1.42	Unknown

c:\SEEKER\BIN\070567d03.res Analysis Results Saved.

 SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0716004-2 RA-226 STD VER

 Sampling Start: 09/01/2003 10:00:00 | Counting Start: 05/04/2007 09:05:53
 Sampling Stop: 09/01/2003 10:00:00 | Decay Time. 3.22E+004 Hrs
 Buildup Time. 0.00E+000 Hrs | Live Time 7200 Sec
 Sample Size 1.00E+000 L | Real Time 7291 Sec
 Collection Efficiency 1.0000 | Spc. File 070689D08.SPC

Detector #: 8 (Detector 8)

Energy(keV) = -0.42 + 0.500*Ch + 0.00E+00*Ch^2 + 0.00E+00*Ch^3 05/04/2007

FWHM(keV) = 0.68 + 0.010*En + 6.24E-04*En^2 + 0.00E+00*En^3 04/02/2007

Where En = Sqrt(Energy in keV)

 Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.50	93.74	12556	303	168	5692	0.74 a	HiResid
2	53.17	107.07	2236	194	140	4331	0.70 a	HiResid
3	59.09	118.89	253	396	325	14593	1.61 a	NET< CL Wide Pk
4	60.23	121.19	76	126	103	2919	0.40 b	NET< CL
5	61.02	122.75	939	462	377	17512	1.98 c	
6	74.89	150.48	15543	374	229	9712	1.00 a	HiResid
7	77.19	155.07	28938	425	210	8143	0.98 b	HiResid
8	79.31	159.30	1444	193	146	4741	0.64 c	HiResid
9	81.14	162.97	31	144	118	3421	0.41 d	NET< CL HiResid
10	83.83	168.34	376	175	140	4348	0.65 e	HiResid
11	87.30	175.27	8703	306	200	6822	1.08 f	HiResid
12	89.65	179.96	2773	279	212	7122	1.33 g	HiResid
13	94.93	190.52	43	171	140	3978	0.78 h	NET< CL HiResid
14	186.48	373.44	13882	305	160	4712	0.98 a	
15	242.35	485.07	12850	271	122	2762	1.05 a	
16	259.22	518.78	825	148	112	2319	1.00 a	
17	274.88	550.08	719	201	160	3537	1.69 a	
18	295.65	591.57	28207	366	119	2402	1.12 a	
19	352.48	705.12	46329	451	110	2049	1.17 a	
20	387.38	774.86	283	123	97	1611	1.11 a	
21	389.56	779.21	433	138	108	1841	1.29 b	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
22	406.60	813.26	135	137	111	1944	1.34	a
23	455.55	911.07	265	96	75	1099	1.08	a
24	462.44	924.83	194	101	80	1186	1.23	a
25	470.39	940.71	45	60	48	571	0.59	a NET< CL
26	475.55	951.03	66	70	56	713	0.82	b
27	481.32	962.56	278	93	71	998	1.09	c
28	487.70	975.31	416	112	86	1284	1.53	d
29	511.34	1022.53	454	155	122	1848	2.62	a Wide Pk
30	534.56	1068.93	233	89	69	868	1.35	a
31	544.62	1089.04	97	92	74	948	1.46	a
32	580.91	1161.54	342	85	63	741	1.37	a
33	583.21	1166.15	96	79	63	741	1.28	b
34	610.23	1220.13	34135	381	78	1053	1.49	a
35	650.10	1299.79	64	63	50	502	1.10	a
36	666.34	1332.24	986	96	60	618	1.51	a
37	704.11	1407.71	294	81	60	630	1.50	a
38	720.84	1441.14	221	78	60	617	1.54	a
39	743.62	1486.66	86	57	44	416	1.03	a
40	769.29	1537.94	3109	142	72	799	1.78	a
41	786.94	1573.21	699	99	69	743	1.82	a
42	807.11	1613.52	606	88	60	635	1.54	a
43	822.08	1643.42	109	79	62	639	1.57	a
44	827.73	1654.72	123	90	72	767	1.93	b
45	840.02	1679.27	327	87	65	689	1.57	a
46	935.09	1869.23	1621	113	65	720	1.88	a
47	965.20	1929.39	171	70	54	563	1.40	a
48	1053.37	2105.56	167	76	59	578	1.89	a
49	1070.41	2139.61	68	43	32	259	0.83	a
50	1121.46	2241.61	6934	182	61	593	2.13	a
51	1156.38	2311.39	675	83	53	492	1.81	a
52	1183.01	2364.59	68	65	52	451	1.90	a
53	1209.23	2416.98	180	65	49	406	2.01	a
54	1239.26	2476.99	2370	119	57	517	2.19	a
55	1254.18	2506.80	67	79	64	574	2.61	a
56	1282.02	2562.42	563	82	55	473	2.23	a
57	1378.73	2755.66	1703	105	54	475	2.41	a
58	1386.27	2770.73	335	75	54	475	2.47	b
59	1402.50	2803.16	485	78	53	481	2.29	a
60	1408.87	2815.90	862	87	53	481	2.23	b
61	1509.98	3017.92	811	92	60	569	2.64	a
62	1539.93	3077.76	100	49	37	285	1.46	a
63	1544.12	3086.13	136	66	51	443	2.25	b
64	1584.07	3165.95	251	61	43	313	2.22	a
65	1595.77	3189.33	38	35	27	177	1.03	a
66	1662.34	3322.34	336	58	37	223	2.39	a
67	1684.62	3366.86	73	40	29	153	2.07	a
68	1693.88	3385.35	86	33	22	106	1.55	b
69	1730.38	3458.30	1111	79	35	191	2.65	a
70	1765.24	3527.95	5073	149	36	194	3.00	a

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
71	1838.78	3674.88	79	35	25	108	2.18	a
72	1848.07	3693.44	756	68	33	158	3.16	b
73	1873.18	3743.63	37	34	26	121	2.06	a

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070689D08.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET080427.BKG (WEEKLY BKG 070427-8)

Bkg.File Detector #: 8

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
1	46.50	12556	303	168	12495	304	169	
2	53.17	2236	194	140	2225	195	141	
6	74.89	15543	374	229	15502	375	230	
7	77.19	28938	425	210	28901	426	211	
10	83.83	376	175	140	362	176	141	
11	87.30	8703	306	200	8690	307	200	
14	186.48	13882	305	160	13842	306	161	
18	295.65	28207	366	119	28196	366	119	
19	352.48	46329	451	110	46318	451	110	
29	511.34	454	155	122	254	158	127	
33	583.21	96	79	63	77	81	65	
34	610.23	34135	381	78	34123	382	79	
50	1121.46	6934	182	61	6931	182	61	

070689D08.SPC Analyzed by

 SEEKER FINAL ACTIVITY REPORT Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0716004-2 RA-226 STD VER

Sampling Start: 09/01/2003 10:00:00	Counting Start: 05/04/2007 09:05:53
Sampling Stop: 09/01/2003 10:00:00	Decay Time. 3.22e+004 Hrs
Buildup Time. 0.00e+000 Hrs	Live Time 7200 Sec
Sample Size 1.00e+000 L	Real Time 7291 Sec
Collection Efficiency 1.0000	Spectrum File 070689D08.SPC
Cr. Level Confidence Interval: 95 %	Det. Limit Confidence Interval: 95 %

Detector #: 8 (Detector 8)
 Efficiency File: (D08) (Sh01).EFF (Geo 1 Eff Cal)
 Eff.=1/[4.54E-01*En^-1.29E+00 + 1.21E+02*En^8.83E-01] 04/03/2007

Library File: . RA-226(186 KEV).LIB (Ra-226 std ver. (186 keV))

MEASURED or MDA CONCENTRATIONS

Nuclide	ENERGY E (keV)	Concentration (pCi/L)	MDA	Critical Level	Half-life (hrs)
Ra-226	186.21	4.55E+04 +- 1.01E+03	1.07E+03	5.28E+02	1.40E+07

MEASURED TOTAL: 4.55E+04 +- 1.01E+03 pCi/L

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.50	93.74	12495	304	169	5692	0.74	Unknown
2	53.17	107.07	2225	195	141	4331	0.70	Unknown
3	59.09	118.89	253	396	325	14593	1.61	Deleted
4	60.23	121.19	76	126	103	2919	0.40	Deleted
5	61.02	122.75	939	462	377	17512	1.98	Unknown
6	74.89	150.48	15502	375	230	9712	1.00	Unknown
7	77.19	155.07	28901	426	211	8143	0.98	Unknown
8	79.31	159.30	1444	193	146	4741	0.64	Unknown
9	81.14	162.97	31	144	118	3421	0.41	Deleted
10	83.83	168.34	362	176	141	4348	0.65	Unknown
11	87.30	175.27	8690	307	200	6822	1.08	Unknown
12	89.65	179.96	2773	279	212	7122	1.33	Unknown
13	94.93	190.52	43	171	140	3978	0.78	Deleted
15	242.35	485.07	12850	271	122	2762	1.05	Unknown
16	259.22	518.78	825	148	112	2319	1.00	1282DEsc

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 UNKNOWN, SUM or ESCAPE PEAKS
 =====

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
17	274.88	550.08	719	201	160	3537	1.69	Unknown
18	295.65	591.57	28196	366	119	2402	1.12	Unknown
19	352.48	705.12	46318	451	110	2049	1.17	Unknown
20	387.38	774.86	283	123	97	1611	1.11	1409DEsc
21	389.56	779.21	433	138	108	1841	1.29	Unknown
22	406.60	813.26	135	137	111	1944	1.34	Unknown
23	455.55	911.07	265	96	75	1099	1.08	Unknown
24	462.44	924.83	194	101	80	1186	1.23	Unknown
25	470.39	940.71	45	60	48	571	0.59	Deleted
26	475.55	951.03	66	70	56	713	0.82	Unknown
27	481.32	962.56	278	93	71	998	1.09	Unknown
28	487.70	975.31	416	112	86	1284	1.53	1510DEsc
29	511.34	1022.53	254	158	127	1848	2.62	Unknown
30	534.56	1068.93	233	89	69	868	1.35	Unknown
31	544.62	1089.04	97	92	74	948	1.46	Unknown
32	580.91	1161.54	342	85	63	741	1.37	Unknown
33	583.21	1166.15	77	81	65	741	1.28	Unknown
34	610.23	1220.13	34123	382	79	1053	1.49	1121SEsc
35	650.10	1299.79	64	63	50	502	1.10	Unknown
36	666.34	1332.24	986	96	60	618	1.51	Unknown
37	704.11	1407.71	294	81	60	630	1.50	Unknown
38	720.84	1441.14	221	78	60	617	1.54	Unknown
39	743.62	1486.66	86	57	44	416	1.03	1765DEsc
40	769.29	1537.94	3110	142	72	799	1.78	1282SEsc
41	786.94	1573.21	699	99	69	743	1.82	Unknown
42	807.11	1613.52	606	88	60	635	1.54	Unknown
43	822.08	1643.42	109	79	62	639	1.57	Unknown
44	827.73	1654.72	123	90	72	767	1.93	1848DEsc
45	840.02	1679.27	327	87	65	689	1.57	Unknown
46	935.09	1869.23	1621	113	65	720	1.88	Unknown
47	965.20	1929.39	171	70	54	563	1.40	Unknown
48	1053.37	2105.56	167	76	59	578	1.89	Unknown
49	1070.41	2139.61	68	43	32	259	0.83	Unknown
50	1121.46	2241.61	6931	182	61	593	2.13	Unknown
51	1156.38	2311.39	675	83	53	492	1.81	Unknown
52	1183.01	2364.59	68	65	52	451	1.90	Unknown
53	1209.23	2416.98	180	65	49	406	2.01	Unknown
54	1239.26	2476.99	2370	119	57	517	2.19	Unknown
55	1254.18	2506.80	67	79	64	574	2.61	1765SEsc
56	1282.02	2562.42	563	82	55	473	2.23	Unknown
57	1378.73	2755.66	1703	105	54	475	2.41	Unknown
58	1386.27	2770.73	335	75	54	475	2.47	Unknown
59	1402.50	2803.16	485	78	53	481	2.29	Unknown
60	1408.87	2815.90	862	87	53	481	2.23	Unknown
61	1509.98	3017.92	811	92	60	569	2.64	Unknown
62	1539.93	3077.76	100	49	37	285	1.46	Unknown
63	1544.12	3086.13	136	66	51	443	2.25	Unknown
64	1584.07	3165.95	251	61	43	313	2.22	Unknown
65	1595.77	3189.33	38	35	27	177	1.03	Unknown

070689D08.SPC Analyzed by

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UNKNOWN, SUM or ESCAPE PEAKS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
66	1662.34	3322.34	336	58	37	223	2.39	Unknown
67	1684.62	3366.86	73	40	29	153	2.07	Unknown
68	1693.88	3385.35	86	33	22	106	1.55	Unknown
69	1730.38	3458.30	1111	79	35	191	2.65	Unknown
70	1765.24	3527.95	5073	149	36	194	3.00	Unknown
71	1838.78	3674.88	79	35	25	108	2.18	Unknown
72	1848.07	3693.44	756	68	33	158	3.16	Unknown
73	1873.18	3743.63	37	34	26	121	2.06	Unknown

c:\SEEKER\BIN\070689d08.res Analysis Results Saved.

070732D09.SPC Analyzed by *llh*

SEEKER G A M M A A N A L Y S I S R E S U L T S PS Version 1.8.4

Paragon Analytics, Div. of DataChem Lab
GammaScan

Geo 1 / Water

Sample ID: 0716004-3 RA-226 STD VER

Sampling Start: 09/01/2003 10:00:00 | Counting Start: 05/07/2007 09:55:14
Sampling Stop: 09/01/2003 10:00:00 | Decay Time. 3.23E+004 Hrs
Buildup Time. 0.00E+000 Hrs | Live Time 7200 Sec
Sample Size 1.00E+000 L | Real Time 7265 Sec
Collection Efficiency 1.0000 | Spc. File 070732D09.SPC

Detector #: 9 (Detector 9)
Energy(keV) = -1.00 + 0.500*Ch + 2.08E-07*Ch^2 + 0.00E+00*Ch^3 05/07/2007
FWHM(keV) = 0.81 + 0.004*En + 8.32E-04*En^2 + 0.00E+00*En^3 03/12/2007
Where En = Sqrt(Energy in keV)

Search Sensitivity: 1.00 | Sigma Multiplier: 2.00 | Search Start/End: 80/4000

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PEAK SEARCH RESULTS

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PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.56	95.11	736	224	179	5928	1.04	a
2	53.06	108.10	214	193	157	4943	0.83	a
3	74.76	151.49	6466	305	213	8366	0.96	a HiResid Wide Pk
4	77.18	156.33	15365	350	203	7596	0.96	b HiResid
5	79.51	161.00	12	176	145	4656	0.61	c NET< CL HiResid
6	80.33	162.63	-1	552	454	19847	2.72	d NET< CL HiResid
7	83.92	169.81	17	201	165	5487	0.85	e NET< CL HiResid
8	87.21	176.39	4489	236	159	5128	0.85	f HiResid
9	89.84	181.66	1916	207	155	4821	0.80	g HiResid
10	92.52	187.00	4	183	151	4581	0.79	h NET< CL HiResid
11	94.97	191.90	148	182	149	4452	0.76	i NET< CL HiResid
12	98.15	198.27	154	203	166	5093	0.98	j NET< CL HiResid
13	186.29	374.49	12326	306	174	5568	0.96	a
14	242.09	486.02	14238	290	136	3420	1.06	a
15	258.99	519.81	784	163	126	2936	1.05	a
16	274.55	550.92	940	257	206	5210	1.90	a Wide Pk
17	292.50	586.80	105	125	102	2086	0.87	a

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
18	295.32	592.43	30844	386	131	2920	1.10	b
19	350.16	702.03	522	203	163	3905	1.89	a Wide Pk
20	352.09	705.89	50902	470	107	2278	1.16	b
21	386.98	775.63	312	101	77	1365	0.90	a
22	389.15	779.96	365	102	77	1365	0.78	b
23	396.10	793.86	92	96	77	1361	0.85	a
24	405.89	813.43	194	149	120	2516	1.54	a
25	414.63	830.88	52	110	90	1702	0.96	a NET< CL
26	439.45	880.49	85	117	95	1663	1.27	a NET< CL
27	454.80	911.15	329	113	88	1436	1.23	a
28	460.78	923.11	51	89	72	1094	0.93	a NET< CL
29	462.54	926.62	135	91	72	1094	1.01	b
30	470.21	941.95	156	97	77	1173	1.22	a
31	474.60	950.73	52	65	52	670	0.66	b NET< CL
32	480.80	963.11	351	83	61	838	0.85	c
33	487.27	976.03	454	112	85	1340	1.32	d
34	509.96	1021.38	205	117	93	1433	1.60	a
35	511.12	1023.70	38	60	48	573	0.66	b NET< CL
36	512.00	1025.45	301	136	108	1719	2.01	c
37	534.07	1069.56	153	80	63	830	1.03	a
38	580.42	1162.16	272	88	67	894	1.14	a
39	609.62	1220.49	37970	402	80	1110	1.40	a HiResid
40	639.38	1279.95	75	105	85	1064	2.00	a NET< CL
41	665.74	1332.61	1060	99	61	688	1.32	a
42	683.27	1367.61	118	130	106	1320	2.73	a Wide Pk
43	703.51	1408.04	274	95	73	884	1.62	a
44	720.06	1441.11	278	93	72	904	1.77	a
45	723.86	1448.70	47	64	51	575	1.12	b NET< CL
46	741.05	1483.03	62	70	56	647	1.33	a
47	742.90	1486.72	83	65	51	566	1.09	b
48	753.03	1506.96	78	70	56	642	1.24	a
49	768.62	1538.08	3430	142	66	813	1.62	a HiResid
50	786.22	1573.23	738	91	60	696	1.45	a
51	806.58	1613.90	772	97	65	780	1.57	a
52	821.23	1643.16	85	78	62	747	1.45	a
53	839.44	1679.53	445	92	67	829	1.56	a
54	934.34	1869.02	1742	111	60	710	1.52	a
55	964.30	1928.85	189	75	57	639	1.48	a
56	1052.63	2105.18	169	87	68	748	2.12	a
57	1070.51	2140.87	114	64	50	485	1.39	a
58	1105.05	2209.82	64	52	41	387	1.06	a
59	1120.76	2241.18	7534	186	56	603	1.87	a
60	1134.06	2267.74	132	60	46	438	1.55	a
61	1155.63	2310.80	887	91	56	583	1.98	a
62	1208.37	2416.05	176	67	51	498	1.76	a
63	1238.61	2476.40	2742	122	52	494	1.89	a
64	1253.86	2506.83	191	85	66	672	2.85	a
65	1281.29	2561.57	562	77	50	464	1.89	a
66	1378.16	2754.86	1966	106	48	433	2.02	a

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET/MDA COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
67	1385.88	2770.27	357	70	48	433	1.94	b
68	1402.04	2802.51	570	78	51	462	2.10	a
69	1408.42	2815.24	1078	93	54	497	2.26	b
70	1461.65	2921.42	78	43	33	249	1.17	a
71	1509.72	3017.31	845	92	59	589	2.27	a
72	1539.13	3075.99	236	88	68	663	3.08	a
73	1543.79	3085.28	110	62	48	419	1.89	b
74	1583.78	3165.04	240	59	41	309	2.04	a
75	1595.33	3188.09	101	62	48	383	2.48	a
76	1600.01	3197.42	94	47	36	255	1.66	b
77	1661.87	3320.79	408	60	36	223	2.29	a
78	1684.83	3366.57	88	40	30	161	1.99	a
79	1693.52	3383.90	106	43	31	174	2.13	b
80	1730.26	3457.17	1183	80	34	193	2.47	a
81	1765.20	3526.84	5666	156	34	188	2.43	a HiResid
82	1838.90	3673.78	104	40	29	141	2.31	a
83	1848.12	3692.16	790	66	29	141	2.35	b
84	1873.80	3743.36	53	37	28	130	2.31	a

070732D09.SPC Analyzed by

SEEKER BACKGROUND SUBTRACT RESULTS Vers. 2.2.1

Paragon Analytics, Div. of DataChem Lab
GammaScan

Background File: DET090504.BKG (WEEKLY BKG 070504-9)

Bkg.File Detector #: 9

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BACKGROUND SUBTRACT RESULTS

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PK#	ENERGY (keV)	OLD NET COUNTS	OLD UN- CERTAINTY	OLD CR.LEVEL	NEW NET COUNTS	NEW UN- CERTAINTY	NEW CR.LEVEL	FLAG
3	74.76	6466	305	213	6457	306	214	
4	77.18	15365	350	203	15343	350	204	
5	79.51	12	176	145	43	179	147	NET<CL
7	83.92	17	201	165	11	202	166	NET<CL
8	87.21	4489	236	160	4514	237	160	
9	89.84	1916	207	155	1899	209	156	
10	92.52	4	183	151	-52	185	153	NET<CL
13	186.29	12326	306	174	12285	307	175	
18	295.32	30844	386	131	30828	386	132	
19	350.16	522	203	163	507	203	163	
34	509.96	205	117	93	8	121	99	NET<CL
39	609.62	37970	402	80	37954	402	82	
70	1461.65	78	43	33	23	45	36	NET<CL
81	1765.20	5666	156	34	5661	156	34	

 SEEKER FINAL ACTIVITY REPORT Version 2.2.1

Paragon Analytics, Div. of DataChem Lab
 GammaScan

Geo 1 / Water

Sample ID: 0716004-3 RA-226 STD VER

 Sampling Start: 09/01/2003 10:00:00 | Counting Start: 05/07/2007 09:55:14
 Sampling Stop: 09/01/2003 10:00:00 | Decay Time: 3.23e+004 Hrs
 Buildup Time: 0.00e+000 Hrs | Live Time 7200 Sec
 Sample Size 1.00e+000 L | Real Time 7265 Sec
 Collection Efficiency 1.0000 | Spectrum File 070732D09.SPC
 Cr. Level Confidence Interval: 95 % | Det. Limit Confidence Interval: 95 %

Detector #: 9 (Detector 9)

Efficiency File: (D09)(Sh01).EFF (Geo 1 Eff Cal)

Eff=10[^][-2.32E+01 +2.03E+01*L +-4.73E+00*L[^]2 +0.00E+00*L[^]3] 03/13/2007

Eff.=10[^][-6.06E+00 +5.69E+00*L +-2.18E+00*L[^]2 +2.41E-01*L[^]3] Above 180.00 keV

 Library File: . RA-226(186 KEV).LIB (Ra-226 std ver. (186 keV))
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MEASURED or MDA CONCENTRATIONS

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	N					
	ENERGY E	Concentration		Critical	Half-life	
Nuclide	(keV) T	(pCi/L)	MDA	Level	(hrs)	
Ra-226	186.21	4.69E+04 +- 1.17E+03	1.34E+03	6.67E+02	1.40E+07	

MEASURED TOTAL: 4.69E+04 +- 1.17E+03 pCi/L

UNKNOWN, SUM or ESCAPE PEAKS

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PK.	ENERGY	ADDRESS	NET	UN-	C.L.	BKG	FWHM	
#	(keV)	CHANNEL	COUNTS	CERTAINTY	COUNTS	COUNTS	(keV)	FLAG
1	46.56	95.11	736	224	179	5928	1.04	1071DEsc
2	53.06	108.10	214	193	157	4943	0.83	Unknown
3	74.76	151.49	6457	306	214	8366	0.96	Unknown
4	77.18	156.33	15343	350	204	7596	0.96	Unknown
5	79.51	161.00	43	179	147	4656	0.61	Deleted
6	80.33	162.63	-1	552	454	19847	2.72	Deleted
7	83.92	169.81	11	202	166	5487	0.85	Deleted
8	87.21	176.39	4514	237	160	5128	0.85	Unknown
9	89.84	181.66	1899	209	156	4821	0.80	Unknown
10	92.52	187.00	-52	185	153	4581	0.79	Deleted
11	94.97	191.90	148	182	149	4452	0.76	Deleted
12	98.15	198.27	154	203	166	5093	0.98	Deleted
14	242.09	486.02	14238	290	136	3420	1.06	Unknown
15	258.99	519.81	784	163	126	2936	1.05	1281DEsc

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
16	274.55	550.92	940	257	206	5210	1.90	Unknown
17	292.50	586.80	105	125	102	2086	0.87	Unknown
18	295.32	592.43	30828	386	132	2920	1.10	Unknown
19	350.16	702.03	507	203	163	3905	1.89	Unknown
20	352.09	705.89	50902	470	108	2278	1.16	Unknown
21	386.98	775.63	312	101	77	1365	0.90	1408DEsc
22	389.15	779.96	365	102	77	1365	0.78	Unknown
23	396.10	793.86	92	96	77	1361	0.85	Unknown
24	405.89	813.43	194	149	120	2516	1.54	Unknown
25	414.63	830.88	52	110	90	1702	0.96	Deleted
26	439.45	880.49	85	117	95	1663	1.27	Deleted
27	454.80	911.15	329	113	88	1436	1.23	Unknown
28	460.78	923.11	51	89	72	1094	0.93	Deleted
29	462.54	926.62	135	91	72	1094	1.01	Unknown
30	470.21	941.95	156	97	77	1173	1.22	Unknown
31	474.60	950.73	52	65	52	670	0.66	Deleted
32	480.80	963.11	351	83	61	838	0.85	Unknown
33	487.27	976.03	454	112	85	1340	1.32	1510DEsc
34	509.96	1021.38	8	121	99	1433	1.60	Deleted
35	511.12	1023.70	38	60	48	573	0.66	Deleted
36	512.00	1025.45	301	136	108	1719	2.01	Unknown
37	534.07	1069.56	153	80	63	830	1.03	Unknown
38	580.42	1162.16	272	88	67	894	1.14	Unknown
39	609.62	1220.49	37954	402	82	1110	1.40	1121SEsc
40	639.38	1279.95	75	105	85	1064	2.00	Deleted
41	665.74	1332.61	1060	99	61	688	1.32	Unknown
42	683.27	1367.61	118	130	106	1320	2.73	Unknown
43	703.51	1408.04	274	95	73	884	1.62	Unknown
44	720.06	1441.11	278	93	72	904	1.77	Unknown
45	723.86	1448.70	47	64	51	575	1.12	Deleted
46	741.05	1483.03	62	70	56	647	1.33	1254SEsc
47	742.90	1486.72	83	65	51	566	1.09	1765DEsc
48	753.03	1506.96	78	70	56	642	1.24	Unknown
49	768.62	1538.08	3430	142	66	813	1.62	1281SEsc
50	786.22	1573.23	738	91	60	696	1.45	Unknown
51	806.58	1613.90	772	97	65	780	1.57	Unknown
52	821.23	1643.16	85	78	62	747	1.45	Unknown
53	839.44	1679.53	445	92	67	829	1.56	Unknown
54	934.34	1869.02	1742	111	60	710	1.52	Unknown
55	964.30	1928.85	189	75	57	639	1.48	Unknown
56	1052.63	2105.18	169	87	68	748	2.12	Unknown
57	1070.51	2140.87	114	64	50	485	1.39	Unknown
58	1105.05	2209.82	64	52	41	387	1.06	Unknown
59	1120.76	2241.18	7534	186	56	603	1.87	Unknown
60	1134.06	2267.74	132	60	46	438	1.55	Unknown
61	1155.63	2310.80	887	91	56	583	1.98	Unknown
62	1208.37	2416.05	176	67	51	498	1.76	Unknown
63	1238.61	2476.40	2742	122	52	494	1.89	Unknown
64	1253.86	2506.83	191	85	66	672	2.85	1765SEsc

070732D09.SPC Analyzed by

UNKNOWN, SUM or ESCAPE PEAKS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN- CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
65	1281.29	2561.57	562	77	50	464	1.89	Unknown
66	1378.16	2754.86	1966	106	48	433	2.02	Unknown
67	1385.88	2770.27	357	70	48	433	1.94	Unknown
68	1402.05	2802.51	570	78	51	462	2.10	Unknown
69	1408.42	2815.24	1078	93	54	497	2.26	Unknown
70	1461.65	2921.42	23	45	36	249	1.17	Deleted
71	1509.72	3017.31	845	92	59	589	2.27	Unknown
72	1539.13	3075.99	236	88	68	663	3.08	Unknown
73	1543.79	3085.28	110	62	48	419	1.89	Unknown
74	1583.78	3165.04	240	59	41	309	2.04	Unknown
75	1595.33	3188.09	101	62	48	383	2.48	Unknown
76	1600.01	3197.42	94	47	36	255	1.66	Unknown
77	1661.87	3320.79	408	60	36	223	2.29	Unknown
78	1684.83	3366.57	88	40	30	161	1.99	Unknown
79	1693.52	3383.90	106	43	31	174	2.13	Unknown
80	1730.26	3457.17	1183	80	34	193	2.47	Unknown
81	1765.20	3526.84	5661	156	34	188	2.43	Unknown
82	1838.90	3673.78	104	40	29	141	2.31	Unknown
83	1848.12	3692.16	790	66	29	141	2.35	Unknown
84	1873.80	3743.36	53	37	28	130	2.31	Unknown

c:\SEEKER\BIN\070732d09.res Analysis Results Saved.

Gamma Spectrometer Run Log

Date: 5/3/07Reviewed By/Date: JLH 5/4/07

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
65070420-4 LLS	JLH	1	8	30	8:20	JLH	070523 201.SPC	JLH
65070423-1 LLS	JLH	4	1	↓	↓	L	070548 204.SPC	JLH
0704229-2	JLH	6	13	30	8:25	JLH	070675 206.SPC	JLH
↓ -2 A	JLH	9	↓	↓	↓	L	070714 209.SPC	JLH
65070430-4 LLS	JLH	8	6	30	8:31	JLH	070683 208.SPC	JLH
65070425-2 LLS	JLH	4	1	30	9:08	JLH	070549 204.SPC	JLH
65070420-4 MB	JLH	1	8	500	↓	L	070594 201.SPC	JLH
0704229-4	JLH	6	13	30	9:22	JLH	070676 206.SPC	JLH
65070502-5 MB	JLH	9	↓	↓	↓	↓	070715 209.SPC	JLH
65070502-5 LLS	JLH	8	↓	↓	↓	↓	070684 208.SPC	JLH
0716 004-1	JLH	3	1	120	↓	↓	070567 203.SPC	JLH
0704229-1	JLH	4	1	220	10:02	JLH	070551 204.SPC	JLH
↓ -3	JLH	6	↓	↓	↓	↓	070677 206.SPC	JLH
0704248-3	JLH	8	↓	↓	↓	↓	070685 208.SPC	JLH
0705006-1	JLH	9	↓	300	↓	↓	070717 209.SPC	JLH
0705006-3	JLH	3	1	255	11:31	JLH	070570 203.SPC	JLH
0704245-57	JLH	4	6	500	15:52	JLH	070552 204.SPC	JLH
↓ -65	JLH	6	↓	↓	↓	↓	070678 206.SPC	JLH
65070430-4 MB	JLH	8	↓	↓	↓	↓	070686 208.SPC	JLH
0704229-1 A	JLH	9	1	300	↓	↓	070718 209.SPC	JLH
65070502-4 A,B,C MB	JLH	3	1	↓	16:37	JLH	070571 203.SPC	JLH
5/4/07								

- 1 Analyst will verify the position, detector, and geometry when the sample is removed from the detector.
- 2 Calibration geometry.
- 3 Count duration.

KEY:

- * sample was counted on a puck
- ↑ sample was counted with air flow arrow pointing up
- ↓ sample was counted with air flow arrow pointing down

324784 B

Gamma Spectrometer Run Log

Date: 5/4/07Reviewed By/Date: JLK 5/7/07

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
0704063-2	JLK	1	9A	60	8:56	JLK	070596001.SPC	JLK
0704179-17	JLK	3	13	120			070574003.SPC	JLK
↓ -17D	JLK	4	↓	↓			070555004.SPC	JLK
0704181-6	JLK	6	↓	90			070680006.SPC	JLK
65070502-4 LCS	JLK	9	1	-30	↓	↓	070720009.SPC	JLK
0716004-2	JLK	8	1	120	9:05	JLK	070699008.SPC	JLK
0704181-11	JLK	9	13	180	9:39	JLK	070723009.SPC	JLK
0705031-1	JLK	3	7*	60	11:24	JLK	070575003.SPC	JLK
↓ -9	JLK	4	↓	↓	↓	↓	070556004.SPC	JLK
↓ -17	JLK	6	↓	↓	↓	↓	070681006.SPC	JLK
0705031-9D	JLK	3	7*	60	12:30	JLK	070576003.SPC	JLK
↓ -26	JLK	4	↓	↓	↓	↓	070557004.SPC	JLK
↓ -27	JLK	6	↓	↓	↓	↓	070682006.SPC	JLK
0705031-28	JLK	9	7*	60	12:44	JLK	070724009.SPC	JLK
0705031-29	JLK	3	7*	60	13:46	JLK	070577003.SPC	JLK
↓ -30	JLK	4	↓	↓	↓	↓	070558004.SPC	JLK
↓ -31	JLK	6	↓	↓	14:59 15:46	↓	070683006.SPC	JLK
65070504-2 MB	JLK	9	↓	↓	13:46	↓	070725009.SPC	JLK
65070504-2 LCS	JLK	4	7*	30	14:54	JLK	070559004.SPC	JLK
070504-1	JHO	1	WBK6	1000	17:24	JLK	070597001.SPC	JHO
↓ -2	JHO	2	↓	↓	↓	↓	070682002.SPC ^{to 51607}	JHO
↓ -3	JHO	3	↓	↓	↓	↓	070578003.SPC	JHO
↓ -4	JHO	4	↓	↓	↓	↓	070560004.SPC	JHO
↓ -6	JHO	6	↓	↓	↓	↓	070684006.SPC	JHO

- 1 Analyst will verify the position, detector, and geometry when the sample is removed from the detector.
- 2 Calibration geometry.
- 3 Count duration.

KEY:

- * sample was counted on a puck
- ↑ sample was counted with air flow arrow pointing up
- ↓ sample was counted with air flow arrow pointing down

324785 B

Gamma Spectrometer Run Log

Date: 5/7/07Reviewed By/Date: JR4 5/8/07

Sample ID	Ver ¹	Det. No.	Geo ²	Count Dur. (min.) ³	Start Time	Analyst	File ID/Comments	Saved?
070507-8	JR4	8	wBK6	1000	9:51	JR4	070698 do 8.SPC	JR4
0704179-6	JR4	1	11	90	9:55	JR4	070602 do 1.SPC	JR4
↓ -6A	JR4	3	↓	↓	↓	↓	070589 do 3.SPC	JR4
↓ -11	JR4	4	↓	180	↓	↓	070567 do 4.SPC	JR4
65070427-1 MB	JR4	6	13	↓	↓	↓	070690 do 6.SPC	JR4
0716004-3	JR4	9	1	120	↓	↓	070732 do 9.SPC	JR4
0713001-2 (824)	JR4	2	1	60	10:16	JR4	070690 do 2.SPC	JR4
65070430-5 MB	JR4	1	11	180	11:41	JR4	070603 do 1.SPC	JR4
65070430-5 LCS	JR4	3	↓	30	↓	↓	070585 do 3.SPC	JR4
0713002-2 (824)	JR4	2	1	60	12:25	JR4	070691 do 2.SPC	JR4
65070427-1 LCS	JR4	3	13	30	12:36	JR4	070586 do 3.SPC	JR4
0713002-2 (718)	JR4	2	1	60	13:35	JR4	070692 do 2.SPC	JR4
0704246-1	JR4	3	11	120	14:22	JR4	070587 do 3.SPC	JR4
↓ -1B	JR4	4	↓	↓	↓	↓	070588 do 4.SPC	JR4
↓ -2	JR4	6	↓	↓	↓	↓	070691 do 6.SPC	JR4
↓ -3	JR4	9	↓	↓	↓	↓	070733 do 9.SPC	JR4
0704246-4	JR4	1	11	120	14:49	JR4	070604 do 1.SPC	JR4
0703008-2 (829)	JR4	2	13	30	14:54	JR4	070693 do 2.SPC	JR4
0713008-2 (817)	JR4	2	13	30	15:45	JR4	070694 do 2.SPC	JR4
0704172-7	JR4	3	1	300	16:42	JR4	070588 do 3.SPC	JR4
↓ -8	JR4	4	↓	↓	↓	↓	070589 do 4.SPC	JR4
↓ -9	JR4	6	↓	↓	↓	↓	070692 do 6.SPC	JR4
↓ -10	JR4	9	↓	↓	↓	↓	070734 do 9.SPC	JR4
0704246-5	JR4	1	11	120	17:04	JR4	070605 do 1.SPC	JR4

- Analyst will verify the position, detector, and geometry when the sample is removed from the detector.
- Calibration geometry.
- Count duration.

KEY:

- * sample was counted on a puck
- ↑ sample was counted with air flow arrow pointing up
- ↓ sample was counted with air flow arrow pointing down

324789 B

Form 754r12b.doc (3/7/2007)

W5 SR 89 Eff planchets 226Ra Standard Verification
4/30/07

Paragon Analytics

315028 A WORKSHEET FOR IN-HOUSE OR RUSH SAMPLES / Ra/Sr Lab

Matrix Unacid Prep Analyst ALB Prep Date 4/30/07 Analyte 226Ra Analytical Batch _____
 Pretreatment? (Y / N) Batch _____ Count Date / Time _____ Superseded _____

Paragon WO No.	Sample Wt. (g/L)	Sample Aliq. (g/L)	Aliquot Basis (Dry / AR)	Spike Information	Remarks	Det. No.	Filename	POS Cld By
07-16004 - 1	N/A	N/A	AR	S1	Count Date 5/13/07	3	070567003.SPC	gpc
↓ - 2	↓	↓	↓	↓	5/14/07	8	070687005.SPC	gpc
↓ - 3	↓	↓	↓	↓	5/17/07	9	070732007.SPC	gpc

315028 B

Paragon Analytics

WORKSHEET FOR IN-HOUSE OR RUSH SAMPLES / Ra/Sr Lab

Initials RES Date 4/30/07

Method (SOP / Rev) 748

Matrix liquid

COMMENTS

226 Ra Standard Verification

① 1 L of standard poured into a 600 ml marinelli

Reviewed by / Date
RES

BG 5/10/07

Radiochemistry Solution Report

Solution ID: 818.3020.76	Name: Ra226 Working Standard	Lot: []	Vendor Name: []	Type: IS
--------------------------	------------------------------	----------	------------------	----------

Final Vol: 998.7026	Dept: RD	Prep By: KAB	Reviewed By: []	on 5/15/2007
Units: mL	Location: RADSTD	Opened By: []	Verified By: JRK	on 5/3/2007
Matrix: LIQUID	Expire Date: 5/2/2008	Received By: []	Deactivated By: []	on

Comment:

Component Name	Component ID	Volume Added	Units
Ra226 Intermediate Standard	818.3020.31	5.4124	g

CompName	Act/Conc	Calibration Date	Reference Date	1/2 Life (Yrs)	Final Act/Conc	Summed Conc	Units
Rn-222	67081.02	9/1/2003	5/15/2007	1600 (Pmt)	44.9720342003953		pCi/ml
Ra-226	67081.02	9/1/2003	5/15/2007	1600	44.9720265832253		pCi/ml

Associated Parent IDs

818	818.3020.31
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Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
 NE = Not Entered
 (Pmt) = Secular equilibrium; parent half life used to calculate concentration.

Date Printed: Tuesday, May 15, 2007

A Division of Datachem Laboratories

Paragon Analytics

Standards DB Version: 1.079

Parent Solutions Sub Report

Solution Id: 818 Name: Ra226 Primary Standard Type: PS

Final Vol: 5.086 Units: g Matrix: LIQUID

CompName	Calibration Date	Reference Date	Decay Corrected Act/Conc	Units
Ra-226	9/1/2003	5/15/2007	2.3315857681424E-102	pCi/g
Ra-226	9/1/2003	5/15/2007	66973.5287867548	pCi/g

Solution Id: 818.3020.31 Name: Ra226 Intermediate Standard Type: IS

Final Vol: 39.9317 Units: g Matrix: LIQUID

CompName	Calibration Date	Reference Date	Decay Corrected Act/Conc	Units
Ra-226	9/1/2003	5/15/2007	8298.29229564024	pCi/g
Ra-226	9/1/2003	5/15/2007	2.8889294900283E-103	pCi/g

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered. (Print) = Secular equilibrium; parent half life used to calculate concentration.
NE = Not Entered

Date Printed: Tuesday, May 15, 2007

A Division of Datachem Laboratories

Paragon Analytics
Standards DB Version: 1.079

Daily Checks

1/24
1/24/09

238 of 263

Lucas Cell + PMT Daily Performance Check Summary - Detector E, Scalar #3

r:\inst\alphascnt\dailychk.xls

Operating Voltage: 1200kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9239	OK	8316	10162
2	1/15/2009	1	9394	OK	8316	10162
3	1/16/2009	1	9272	OK	8316	10162
4	1/16/2009	1	9372	OK	8316	10162
5	1/18/2009	1	9215	OK	8316	10162
6	1/18/2009	1	9194	OK	8316	10162
7	1/19/2009	1	9340	OK	8316	10162
8	1/19/2009	1	9185	OK	8316	10162

Lucas Cell + PMT Daily Performance Check Summary - Detector B, Scalar #2

r:\instalphscnt\dailychk.xls

Operating Voltage: 1100kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9536	OK	8583	10489
2	1/15/2009	1	9436	OK	8583	10489
3	1/16/2009	1	9403	OK	8583	10489
4	1/16/2009	1	9520	OK	8583	10489
5	1/18/2009	1	9399	OK	8583	10489
6	1/18/2009	1	9749	OK	8583	10489
7	1/19/2009	1	9623	OK	8583	10489
8	1/19/2009	1	9555	OK	8583	10489

Lucas Cell + PMT Daily Performance Check Summary - Detector C, Scalar #6

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900 kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9582	OK	8624	10540
2	1/15/2009	1	9562	OK	8624	10540
3	1/16/2009	1	9634	OK	8624	10540
4	1/16/2009	1	9437	OK	8624	10540
5	1/18/2009	1	9381	OK	8624	10540
6	1/18/2009	1	9437	OK	8624	10540
7	1/19/2009	1	9405	OK	8624	10540
8	1/19/2009	1	9456	OK	8624	10540

Lucas Cell + PMT Daily Performance Check Summary - Detector D, Scalar #5

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9556	OK	8601	10511
2	1/15/2009	1	9524	OK	8601	10511
3	1/16/2009	1	9323	OK	8601	10511
4	1/16/2009	1	9396	OK	8601	10511
5	1/18/2009	1	9515	OK	8601	10511
6	1/18/2009	1	9492	OK	8601	10511
7	1/19/2009	1	9647	OK	8601	10511
8	1/19/2009	1	9565	OK	8601	10511

Lucas Cell + PMT Daily Performance Check Summary - Detector F, Scalar #1

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900 kV

Historical Control Limits Established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9451	OK	8506	10396
2	1/15/2009	1	9455	OK	8506	10396
3	1/16/2009	1	9413	OK	8506	10396
4	1/16/2009	1	9378	OK	8506	10396
5	1/18/2009	1	9516	OK	8506	10396
6	1/18/2009	1	9470	OK	8506	10396
7	1/19/2009	1	9444	OK	8506	10396
8	1/19/2009	1	9389	OK	8506	10396

Lucas Cell + PMT Daily Performance Check Summary - Detector A, Scalar #7

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 1100 kV

Historical Control Limits Established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9344	OK	8410	10278
2	1/15/2009	1	9338	OK	8410	10278
3	1/16/2009	1	9409	OK	8410	10278
4	1/16/2009	1	9535	OK	8410	10278
5	1/18/2009	1	9437	OK	8410	10278
6	1/18/2009	1	9564	OK	8410	10278
7	1/19/2009	1	9284	OK	8410	10278
8	1/19/2009	1	9478	OK	8410	10278

Lucas Cell + PMT Daily Performance Check Summary - Detector E, Scalar #3

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 1200kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9239	OK	8316	10162
2	1/15/2009	1	9394	OK	8316	10162
3	1/16/2009	1	9272	OK	8316	10162
4	1/16/2009	1	9372	OK	8316	10162
5	1/18/2009	1	9215	OK	8316	10162
6	1/18/2009	1	9194	OK	8316	10162
7	1/19/2009	1	9340	OK	8316	10162
8	1/19/2009	1	9185	OK	8316	10162
9	1/21/2009	1	9203	OK	8316	10162
10	1/21/2009	1	9188	OK	8316	10162
11	1/22/2009	1	9133	OK	8316	10162
12	1/22/2009	1	9192	OK	8316	10162
13	1/23/2009	1	9256	OK	8316	10162
14	1/23/2009	1	9108	OK	8316	10162
15	1/26/2009	1	9160	OK	8316	10162
16	1/26/2009	1	9246	OK	8316	10162
17	1/27/2009	1	9289	OK	8316	10162
18	1/27/2009	1	9200	OK	8316	10162

Lucas Cell + PMT Daily Performance Check Summary - Detector B, Scalar #2

r:\instalphscnt\dailychk.xls

Operating Voltage: 1100kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9536	OK	8583	10489
2	1/15/2009	1	9436	OK	8583	10489
3	1/16/2009	1	9403	OK	8583	10489
4	1/16/2009	1	9520	OK	8583	10489
5	1/18/2009	1	9399	OK	8583	10489
6	1/18/2009	1	9749	OK	8583	10489
7	1/19/2009	1	9623	OK	8583	10489
8	1/19/2009	1	9555	OK	8583	10489
9	1/21/2009	1	9481	OK	8583	10489
10	1/21/2009	1	9570	OK	8583	10489
11	1/22/2009	1	9354	OK	8583	10489
12	1/22/2009	1	9404	OK	8583	10489
13	1/23/2009	1	9538	OK	8583	10489
14	1/23/2009	1	9685	OK	8583	10489
15	1/26/2009	1	9334	OK	8583	10489
16	1/26/2009	1	9403	OK	8583	10489
17	1/27/2009	1	9476	OK	8583	10489
18	1/27/2009	1	9742	OK	8583	10489

Lucas Cell + PMT Daily Performance Check Summary - Detector C, Scalar #6

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900 kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9582	OK	8624	10540
2	1/15/2009	1	9562	OK	8624	10540
3	1/16/2009	1	9634	OK	8624	10540
4	1/16/2009	1	9437	OK	8624	10540
5	1/18/2009	1	9381	OK	8624	10540
6	1/18/2009	1	9437	OK	8624	10540
7	1/19/2009	1	9405	OK	8624	10540
8	1/19/2009	1	9456	OK	8624	10540
9	1/21/2009	1	9515	OK	8624	10540
10	1/21/2009	1	9488	OK	8624	10540
11	1/22/2009	1	9547	OK	8624	10540
12	1/22/2009	1	9557	OK	8624	10540
13	1/23/2009	1	9516	OK	8624	10540
14	1/23/2009	1	9554	OK	8624	10540
15	1/26/2009	1	9699	OK	8624	10540
16	1/26/2009	1	9373	OK	8624	10540
17	1/27/2009	1	9501	OK	8624	10540
18	1/27/2009	1	9843	OK	8624	10540

Lucas Cell + PMT Daily Performance Check Summary - Detector D, Scalar #5

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9556	OK	8601	10511
2	1/15/2009	1	9524	OK	8601	10511
3	1/16/2009	1	9323	OK	8601	10511
4	1/16/2009	1	9396	OK	8601	10511
5	1/18/2009	1	9515	OK	8601	10511
6	1/18/2009	1	9492	OK	8601	10511
7	1/19/2009	1	9647	OK	8601	10511
8	1/19/2009	1	9565	OK	8601	10511
9	1/21/2009	1	9398	OK	8601	10511
10	1/21/2009	1	9747	OK	8601	10511
11	1/22/2009	1	9394	OK	8601	10511
12	1/22/2009	1	9481	OK	8601	10511
13	1/23/2009	1	9373	OK	8601	10511
14	1/23/2009	1	9574	OK	8601	10511
15	1/26/2009	1	9509	OK	8601	10511
16	1/26/2009	1	9399	OK	8601	10511
17	1/27/2009	1	9592	OK	8601	10511
18	1/27/2009	1	9616	OK	8601	10511

Lucas Cell + PMT Daily Performance Check Summary - Detector F, Scalar #1

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900 kV

Historical Control Limits Established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9451	OK	8506	10396
2	1/15/2009	1	9455	OK	8506	10396
3	1/16/2009	1	9413	OK	8506	10396
4	1/16/2009	1	9378	OK	8506	10396
5	1/18/2009	1	9516	OK	8506	10396
6	1/18/2009	1	9470	OK	8506	10396
7	1/19/2009	1	9444	OK	8506	10396
8	1/19/2009	1	9389	OK	8506	10396
9	1/21/2009	1	9428	OK	8506	10396
10	1/21/2009	1	9412	OK	8506	10396
11	1/22/2009	1	9628	OK	8506	10396
12	1/22/2009	1	9414	OK	8506	10396
13	1/23/2009	1	9431	OK	8506	10396
14	1/23/2009	1	9424	OK	8506	10396
15	1/26/2009	1	9446	OK	8506	10396
16	1/26/2009	1	9342	OK	8506	10396
17	1/27/2009	1	9298	OK	8506	10396
18	1/27/2009	1	9396	OK	8506	10396

Lucas Cell + PMT Daily Performance Check Summary - Detector A, Scalar #7

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 1100 kV

Historical Control Limits Established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
1	1/15/2009	1	9344	OK	8410	10278
2	1/15/2009	1	9338	OK	8410	10278
3	1/16/2009	1	9409	OK	8410	10278
4	1/16/2009	1	9535	OK	8410	10278
5	1/18/2009	1	9437	OK	8410	10278
6	1/18/2009	1	9564	OK	8410	10278
7	1/19/2009	1	9284	OK	8410	10278
8	1/19/2009	1	9478	OK	8410	10278
9	1/21/2009	1	9473	OK	8410	10278
10	1/21/2009	1	9489	OK	8410	10278
11	1/22/2009	1	9285	OK	8410	10278
12	1/22/2009	1	9424	OK	8410	10278
13	1/23/2009	1	9501	OK	8410	10278
14	1/23/2009	1	9753	OK	8410	10278
15	1/26/2009	1	9462	OK	8410	10278
16	1/26/2009	1	9326	OK	8410	10278
17	1/27/2009	1	9520	OK	8410	10278
18	1/27/2009	1	9588	OK	8410	10278

ICV

Cell 24 Detector C

818.3020.76

Spike Amount: 1mL

Activity: 100dpm

Ref. Date: 9-11-03

Spike Date: 10-22-07

Ty₂ = 1600y

ti = 1956d; 5.355y

Decay Corrected Activity

$$A_{dc} = \left[e^{(\ln 0.5) \times (t_i / t_{1/2})} \right] \times 100 = 99.7715 \text{ dpm/mL}$$

$$A_{dc} = 45.35 \text{ pCi/mL}$$

Activity

$$A_{ct} = \frac{G_{cpm} - \text{Calb. cpm}}{k}$$

$$A_{ct} = \frac{178.533}{4.1218}$$

$$A_{ct} = 43.31 \text{ pCi/mL}$$

$$k = (A+B) \times C \times K \times L$$

$$A = 1.9359$$

$$B = 0$$

$$C = 0.9678$$

$$L = 1$$

$$K = 2.2$$

$$G_{cpm} = 182.133$$

$$\text{Calb. cpm} = 3.60$$

Radiometric Recovery

$$\frac{A_{ct}}{A_{dc}} = \frac{43.31}{45.35} = 95.56\%$$

$$\% \text{ diff} = 0.04$$



Daily Performance Checks



Radiation standards and check sources
2810 Siler Lane Santa Fe, NM 87501
(505)473-9538 FAX(505)473-5805

Paragon # 191
recd 3-21-96

REF.PO# 65-1924

Certificate of Calibration

(Alpha Sources)

The Thorium 230 alpha source was measured in a proportional counter using P-10 as counting gas. The alpha emissions from the surface of the source were measured at its plateau voltage to determine its 2pi cpm rate. Corrections were applied for background, coincidence loss and backscatter factors when applicable. The source is referenced to NIST 90TH4704627A used in establishing traceability.

Active Diameter(or area) 44mm

Mounting Material SS

Total Diameter(or area) 47mm

Thickness 0.79mm

9,150 cpm

± 460 cpm 2pi

18,000 dpm

± 900 dpm 4pi

0.00812 microcurie

08/20/92 date of measurement

92TH4703015 source serial number

Michael A. Ortiz

Calibration Manager

Charles L. Gonzales

Q.A. Manager

The total uncertainty of the measurement at the 99% confidence interval is 5.0 percent.

AC005

Lucas Cell + PMT Daily Performance Check Summary - Detector B, Scalar #2

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 1100kV

Historical control limits established: 2/17/2009

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
33	2/9/2009	1	9488 OK		8583	10489
34	2/9/2009	1	9438 OK		8583	10489
35	2/10/2009	1	9478 OK		8583	10489
36	2/10/2009	1	9397 OK		8583	10489
37	2/11/2009	1	9579 OK		8583	10489
38	2/11/2009	1	9664 OK		8583	10489
39	2/12/2009	1	9584 OK		8583	10489
40	2/12/2009	1	9492 OK		8583	10489
41	2/13/2009	1	9517 OK		8583	10489
42	2/13/2009	1	9500 OK		8583	10489
43	2/16/2009	1	9393 OK		8583	10489
44	2/16/2009	1	9583 OK		8583	10489
45	2/17/2009	1	9562 OK		9198	9838
46	2/17/2009	1	9543 OK		9198	9838
47	2/19/2009	1	9558 OK		9198	9838
48	2/19/2009	1	9511 OK		9198	9838
49	2/20/2009	1	9546 OK		9198	9838
50	2/20/2009	1	9569 OK		9198	9838
51	2/23/2009	1	9447 OK		9198	9838
52	2/23/2009	1	9531 OK		9198	9838
53	2/24/2009	1	9630 OK		9198	9838
54	2/24/2009	1	9423 OK		9198	9838

Historical Limits Established

Lucas Cell + PMT Daily Performance Check Summary - Detector C, Scalar #6

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Operating Voltage: 900 kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
33	2/9/2009	1	9397	OK	8624	10540
34	2/9/2009	1	9582	OK	8624	10540
35	2/10/2009	1	9580	OK	8624	10540
36	2/10/2009	1	9649	OK	8624	10540
37	2/11/2009	1	9539	OK	8624	10540
38	2/11/2009	1	9507	OK	8624	10540
39	2/12/2009	1	9545	OK	8624	10540
40	2/12/2009	1	9550	OK	8624	10540
41	2/13/2009	1	9451	OK	8624	10540
42	2/13/2009	1	9538	OK	8624	10540
43	2/16/2009	1	9560	OK	8624	10540
44	2/16/2009	1	9498	OK	8624	10540
45	2/17/2009	1	9430	OK	9224	9817
46	2/17/2009	1	9482	OK	9224	9817
47	2/19/2009	1	9466	OK	9224	9817
48	2/19/2009	1	9370	OK	9224	9817
49	2/20/2009	1	9299	OK	9224	9817
50	2/20/2009	1	9455	OK	9224	9817
51	2/23/2009	1	9524	OK	9224	9817
52	2/23/2009	1	9526	OK	9224	9817
53	2/24/2009	1	9439	OK	9224	9817
54	2/24/2009	1	9703	OK	9224	9817

Historical Limits Established

Lucas Cell + PMT Daily Performance Check Summary - Detector D, Scalar #5

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900kV

Historical control limits established: 2/17/2009

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
33	2/9/2009	1	9497	OK	8601	10511
34	2/9/2009	1	9551	OK	8601	10511
35	2/10/2009	1	9483	OK	8601	10511
36	2/10/2009	1	9572	OK	8601	10511
37	2/11/2009	1	9547	OK	8601	10511
38	2/11/2009	1	9507	OK	8601	10511
39	2/12/2009	1	9543	OK	8601	10511
40	2/12/2009	1	9601	OK	8601	10511
41	2/13/2009	1	9400	OK	8601	10511
42	2/13/2009	1	9599	OK	8601	10511
43	2/16/2009	1	9525	OK	8601	10511
44	2/16/2009	1	9619	OK	8601	10511
45	2/17/2009	1	9559	OK	9245	9816
46	2/17/2009	1	9408	OK	9245	9816
47	2/19/2009	1	9474	OK	9245	9816
48	2/19/2009	1	9533	OK	9245	9816
49	2/20/2009	1	9546	OK	9245	9816
50	2/20/2009	1	9591	OK	9245	9816
51	2/23/2009	1	9420	OK	9245	9816
52	2/23/2009	1	9443	OK	9245	9816
53	2/24/2009	1	9407	OK	9245	9816
54	2/24/2009	1	9683	OK	9245	9816

Historical Limits Established

Lucas Cell + PMT Daily Performance Check Summary - Detector F, Scalar #1

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900 kV

Historical Control Limits Established: 2/17/2009

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
33	2/9/2009	1	9353 OK		8506	10396
34	2/9/2009	1	9494 OK		8506	10396
35	2/10/2009	1	9537 OK		8506	10396
36	2/10/2009	1	9595 OK		8506	10396
37	2/11/2009	1	9574 OK		8506	10396
38	2/11/2009	1	9571 OK		8506	10396
39	2/12/2009	1	9626 OK		8506	10396
40	2/12/2009	1	9484 OK		8506	10396
41	2/13/2009	1	9291 OK		8506	10396
42	2/13/2009	1	9438 OK		8506	10396
43	2/16/2009	1	9423 OK		8506	10396
44	2/16/2009	1	9622 OK		8506	10396
45	2/17/2009	1	9458 OK		9189	9773
46	2/17/2009	1	9350 OK		9189	9773
47	2/19/2009	1	9549 OK		9189	9773
48	2/19/2009	1	9459 OK		9189	9773
49	2/20/2009	1	9389 OK		9189	9773
50	2/20/2009	1	9665 OK		9189	9773
51	2/23/2009	1	9422 OK		9189	9773
52	2/23/2009	1	9471 OK		9189	9773
53	2/24/2009	1	9582 OK		9189	9773
54	2/24/2009	1	9462 OK		9189	9773

Historical Limits Established

Lucas Cell + PMT Daily Performance Check Summary - Detector A, Scalar #7

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 1100 kV

Historical Control Limits Established: 2/17/2009

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
33	2/9/2009	1	9701	OK	8410	10278
34	2/9/2009	1	9455	OK	8410	10278
35	2/10/2009	1	9591	OK	8410	10278
36	2/10/2009	1	9616	OK	8410	10278
37	2/11/2009	1	9480	OK	8410	10278
38	2/11/2009	1	9534	OK	8410	10278
39	2/12/2009	1	9658	OK	8410	10278
40	2/12/2009	1	9482	OK	8410	10278
41	2/13/2009	1	9331	OK	8410	10278
42	2/13/2009	1	9488	OK	8410	10278
43	2/16/2009	1	9568	OK	8410	10278
44	2/16/2009	1	9575	OK	8410	10278
45	2/17/2009	1	9623	OK	9171	9807
46	2/17/2009	1	9502	OK	9171	9807
47	2/19/2009	1	9508	OK	9171	9807
48	2/19/2009	1	9400	OK	9171	9807
49	2/20/2009	1	9435	OK	9171	9807
50	2/20/2009	1	9664	OK	9171	9807
51	2/23/2009	1	9459	OK	9171	9807
52	2/23/2009	1	9770	OK	9171	9807
53	2/24/2009	1	9341	OK	9171	9807
54	2/24/2009	1	9624	OK	9171	9807

Historical Limits Established

Lucas Cell + PMT Daily Performance Check Summary - Detector B, Scalar #2

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 1100kV

Historical control limits established: 2/17/2009

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
61	3/2/2009	1	9563 OK		9198	9838
62	3/2/2009	1	9405 OK		9198	9838
63	3/3/2009	1	9516 OK		9198	9838
64	3/3/2009	1	9580 OK		9198	9838
65	3/4/2009	1	9407 OK		9198	9838
66	3/4/2009	1	9336 OK		9198	9838
67	3/5/2009	1	9639 OK		9198	9838
68	3/5/2009	1	9647 OK		9198	9838
69	3/7/2009	1	9272 OK		9198	9838
70	3/7/2009	1	9439 OK		9198	9838
71	3/8/2009	1	9423 OK		9198	9838
72	3/8/2009	1	9737 OK		9198	9838
73	3/9/2009	1	9502 OK		9198	9838
74	3/9/2009	1	9508 OK		9198	9838
75	3/11/2009	1	9541 OK		9198	9838
76	3/11/2009	1	9503 OK		9198	9838
77	3/12/2009	1	9326 OK		9198	9838
78	3/12/2009	1	9500 OK		9198	9838

Lucas Cell + PMT Daily Performance Check Summary - Detector C, Scalar #6

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900 kV

Historical control limits established:

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
61	3/2/2009	1	9409 OK		9224	9817
62	3/2/2009	1	9487 OK		9224	9817
63	3/3/2009	1	9430 OK		9224	9817
64	3/3/2009	1	9514 OK		9224	9817
65	3/4/2009	1	9581 OK		9224	9817
66	3/4/2009	1	9702 OK		9224	9817
67	3/5/2009	1	9399 OK		9224	9817
68	3/5/2009	1	9540 OK		9224	9817
69	3/7/2009	1	9467 OK		9224	9817
70	3/7/2009	1	9503 OK		9224	9817
71	3/8/2009	1	9522 OK		9224	9817
72	3/8/2009	1	9402 OK		9224	9817
73	3/9/2009	1	9503 OK		9224	9817
74	3/9/2009	1	9586 OK		9224	9817
75	3/11/2009	1	9461 OK		9224	9817
76	3/11/2009	1	9366 OK		9224	9817
77	3/12/2009	1	9510 OK		9224	9817
78	3/12/2009	1	9465 OK		9224	9817

Lucas Cell + PMT Daily Performance Check Summary - Detector D, Scalar #5

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900kV

Historical control limits established: 2/17/2009

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
61	3/2/2009	1	9488 OK		9245	9816
62	3/2/2009	1	9381 OK		9245	9816
63	3/3/2009	1	9737 OK		9245	9816
64	3/3/2009	1	9507 OK		9245	9816
65	3/4/2009	1	9536 OK		9245	9816
66	3/4/2009	1	9442 OK		9245	9816
67	3/5/2009	1	9588 OK		9245	9816
68	3/5/2009	1	9443 OK		9245	9816
69	3/7/2009	1	9518 OK		9245	9816
70	3/7/2009	1	9446 OK		9245	9816
71	3/8/2009	1	9603 OK		9245	9816
72	3/8/2009	1	9384 OK		9245	9816
73	3/9/2009	1	9694 OK		9245	9816
74	3/9/2009	1	9520 OK		9245	9816
75	3/11/2009	1	9572 OK		9245	9816
76	3/11/2009	1	9472 OK		9245	9816
77	3/12/2009	1	9485 OK		9245	9816
78	3/12/2009	1	9407 OK		9245	9816

Lucas Cell + PMT Daily Performance Check Summary - Detector F, Scalar #1

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 900 kV

Historical Control Limits Established: 2/17/2009

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
61	3/2/2009	1	9533	OK	9189	9773
62	3/2/2009	1	9355	OK	9189	9773
63	3/3/2009	1	9298	OK	9189	9773
64	3/3/2009	1	9648	OK	9189	9773
65	3/4/2009	1	9641	OK	9189	9773
66	3/4/2009	1	9540	OK	9189	9773
67	3/5/2009	1	9584	OK	9189	9773
68	3/5/2009	1	9600	OK	9189	9773
69	3/7/2009	1	9449	OK	9189	9773
70	3/7/2009	1	9299	OK	9189	9773
71	3/8/2009	1	9567	OK	9189	9773
72	3/8/2009	1	9369	OK	9189	9773
73	3/9/2009	1	9429	OK	9189	9773
74	3/9/2009	1	9558	OK	9189	9773
75	3/11/2009	1	9529	OK	9189	9773
76	3/11/2009	1	9475	OK	9189	9773
77	3/12/2009	1	9322	OK	9189	9773
78	3/12/2009	1	9510	OK	9189	9773

Lucas Cell + PMT Daily Performance Check Summary - Detector A, Scalar #7

r:\inst\alphscnt\dailychk.xls

Operating Voltage: 1100 kV

Historical Control Limits Established: 2/17/2009

Obs. #	Date	Count Dur. (m)	Gross Counts	OK?	LCL	UCL
61	3/2/2009	1	9410	OK	9171	9807
62	3/2/2009	1	9542	OK	9171	9807
63	3/3/2009	1	9605	OK	9171	9807
64	3/3/2009	1	9584	OK	9171	9807
65	3/4/2009	1	9511	OK	9171	9807
66	3/4/2009	1	9421	OK	9171	9807
67	3/5/2009	1	9557	OK	9171	9807
68	3/5/2009	1	9422	OK	9171	9807
69	3/7/2009	1	9471	OK	9171	9807
70	3/7/2009	1	9512	OK	9171	9807
71	3/8/2009	1	9667	OK	9171	9807
72	3/8/2009	1	9552	OK	9171	9807
73	3/9/2009	1	9438	OK	9171	9807
74	3/9/2009	1	9441	OK	9171	9807
75	3/11/2009	1	9355	OK	9171	9807
76	3/11/2009	1	9458	OK	9171	9807
77	3/12/2009	1	9320	OK	9171	9807
78	3/12/2009	1	9439	OK	9171	9807



RESUBMISSION

Radium-228

Case Narrative

Freeport McMoRan Sierrita

FMI-VRP

Work Order Number: 0812177

1. This report consists of the analytical results and supporting documentation for one soil sample received by ALS Paragon on 12/17/08.
 2. This sample was prepared according to SW-846 Method 9320, SOP746R8. Procedure 9320 was modified as follows: The chemical yield was determined by ICP-AES measurement of the pre and post separation concentration of Ba and Y in these samples.
 3. The sample was analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac , which is the ingrown progeny of ^{228}Ra , according to SOP 724R10. The analysis was completed on 01/29/09.
 4. The analysis results for this sample are reported on a 'dry weight' basis in units of pCi/gram.
 5. Method 9320 makes no reference to the analysis of soil samples. The soil samples from this work order were initially leached in concentrated nitric acid. The leachate was then processed as a water sample according to the method.
 6. ICP-AES measurement of barium concentrations prior to chemical separation for sample 0812177-13 showed concentrations less than the amount known to have been added to the sample in the form of barium carrier. To avoid a low bias in the final analytical results the known concentration of the carrier was used in chemical yield calculations in lieu of the pre-separation measurement.
-
1. No further anomalous situations were noted during the preparation and analysis of this sample. All quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jean Anderson

Jean Anderson

Radiochemistry Primary Data Reviewer

12/03/12

Date

Michael H.

Radiochemistry Final Data Reviewer

12-3-12

Date



Section 1

CHAIN OF CUSTODY

ALS Paragon

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 0812177

Client Name: Freeport McMoRan Sierrita

Client Project Name: FMI-VRP

Client Project Number:

Client PO Number: OJ08VT

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
CP-SD-01-0-1.5	0812177-1		SOIL	16-Jul-08	8:30
CP-SD-01-1.5-3.0	0812177-2		SOIL	16-Jul-08	8:30
CP-SD-02-0-1.5	0812177-3		SOIL	16-Jul-08	9:08
CP-SD-02-1.5-3.0	0812177-4		SOIL	16-Jul-08	9:08
CP-SD-06-0-1.5	0812177-5		SOIL	16-Jul-08	9:26
CP-SD-06-1.5-3.0	0812177-6		SOIL	16-Jul-08	9:26
CP-SD-05-0-1.5	0812177-7		SOIL	16-Jul-08	9:45
CP-SD-05-1.5-3.0	0812177-8		SOIL	16-Jul-08	9:45
CP-SD-03-0-1.5	0812177-9		SOIL	16-Jul-08	9:54
CP-SD-03-1.5-3.0	0812177-10		SOIL	16-Jul-08	9:54
CP-P07-1-3	0812177-11		SOIL	17-Jul-08	14:04
CP-P07-0-1	0812177-12		SOIL	17-Jul-08	14:04
CP-P07-5-7	0812177-13		SOIL	17-Jul-08	14:11
CP-SD-04-0-1.5	0812177-14		SOIL	17-Jul-08	14:52
CP-SD-04-1.5-3.0	0812177-15		SOIL	17-Jul-08	14:52
CP-Q09-1-3	0812177-16		SOIL	23-Jul-08	10:15
CP-SD-09-0-1.5	0812177-17		SOIL	28-Jul-08	10:39
CD-SD-09-1.5-3.0	0812177-18		SOIL	28-Jul-08	10:39
CP-P12-1-3	0812177-19		SOIL	23-Jul-08	11:03
OD-SD-02-0-1.5	0812177-20		SOIL	28-Jul-08	11:11



**PARAGON
ANALYTICS**

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID **0812177**

Date: **12/15/08** Page **1** of **2**

Project Name/No.: **FMI-VIRP** Sampler(s): **K. Walsh** Turnaround (circle one): **Standard** or **Rush** (Due **12/15/08**) Dispose: Date **12/15/08** or Return to Client

Report To: **Steven Vaughn**

Phone: **(520) 407-2845**

Fax:

E-mail: **Steven.Vaughn@paragoncorp.com**

Company: **Freeport McMoran**

Address: **Green Valley, AZ 85614**

6200 W Duval Ave Rd.

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (Indicate type: HCl, etc.)	No. of Containers
CP-SD-01-0-1.5	7/16/08	830	①	S	n/a	1
CP-SD-01-1.5-3.0	7/16/08	830	②	S	n/a	1
CP-SD-02-0-1.5	7/16/08	908	③	S	n/a	1
CP-SD-02-1.5-3.0	7/16/08	908	④	S	n/a	1
CP-SD-06-0-1.5	7/16/08	926	⑤	S	n/a	1
CP-SD-06-1.5-3.0	7/16/08	926	⑥	S	n/a	1
CP-SD-05-0-1.5	7/16/08	945	⑦	S	n/a	1
CP-SD-05-1.5-3.0	7/16/08	945	⑧	S	n/a	1
CP-SD-03-0-1.5	7/16/08	954	⑨	S	n/a	1
CP-SD-03-1.5-3.0	7/16/08	954	⑩	S	n/a	1

* Time Zone: EST CST MST PST		Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter	
Comments: Order No. 0548 VT			
Trk # 7971 87199884			
Relinquished By: (1)		Relinquished By: (2)	
Signature K. Walsh	Signature	Signature	Signature
Printed Name Kevin Walsh	Printed Name	Printed Name	Printed Name
Date 12/15/08	Date	Date	Date
Time 1600	Time	Time	Time
Company URS	Company	Company	Company
Received By: (1)		Received By: (2)	
Signature Cheryl Trimble	Signature	Signature	Signature
Printed Name Cheryl Trimble	Printed Name	Printed Name	Printed Name
Date 12-17-08	Date	Date	Date
Time 1045	Time	Time	Time
Company ALS Paragon	Company	Company	Company



PARAGON
ANALYTICS

ALS Paragon

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Chain-of-Custody

LAB ID 0812177

Date: 12/15/08 Page 2 of 2

Project Name/No.: FMI-VRP		Sampler(s): K. Walsh		Turnaround (circle one): <u>Standard</u> or Rush (Due _____) Dispose Date <u>60 day</u> or Return to Client _____		
Report To: Steven Vaughn Phone: (520) 407-2845 Fax: _____ E-mail: Steven.Vaughn@urscorp.com Company: Freeport Mc Moran Address: 6200 W David (near Rte 20) Green Valley, AZ 85614						
Circle method (right); provide additional information as needed (comments).						
Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type: HCl, etc.)	No. of Containers
CP-P07-1-3	7/17/08	1404	11	S	N/A	1
CP-P07-0-1	7/17/08	1404	13	S	N/A	1
CP-P07-5-7	7/17/08	1411	13	S	N/A	1
CP-SD-04-0-1.5	7/17/08	1452	14	S	N/A	1
CP-SD-04-1.5-3.0	7/17/08	1452	15	S	N/A	1
CP-C09-1-3	7/23/08	1015	16	S	N/A	1
CP-SD-09-0-1.5	7/23/08	1034	17	S	N/A	1
CP-SD-09-1.5-3.0	7/23/08	1039	18	S	N/A	1
CP-P12-1-3	7/23/08	1103	19	S	N/A	1
OD-SD-02-0-1.5	7/23/08	1111	20	S	N/A	1
* Time Zone: EST CST MST PST Matrix Key: O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter						
Comments: Order No. 0508 VT						
(1) Relinquished By: <u>K. Walsh</u> Signature _____ Printed Name <u>Kevin Walsh</u> Date <u>12/15/08</u> Time <u>1600</u> Company <u>URS</u>						
(2) Relinquished By: _____ Signature _____ Printed Name _____ Date _____ Time _____ Company _____						
(1) Received By: <u>Cheryl Trimble</u> Signature _____ Printed Name <u>Cheryl Trimble</u> Date <u>12-17-08</u> Time <u>1045</u> Company <u>ALS Paragon</u>						
(2) Received By: _____ Signature _____ Printed Name _____ Date _____ Time _____ Company _____						

CONDITION OF SAMPLE UPON RECEIPT FORM

Paragon Analytics

Client: FreeportWorkorder No: 0812177Project Manager: JEInitials: COTDate: 12-17-08

1. Does this project require any special handling in addition to standard Paragon procedures?	YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES NO
3. Are Custody seals on sample containers intact?	<input checked="" type="radio"/> NONE	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible ?	<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF <input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly ? (excluding volatiles)	<input checked="" type="radio"/> N/A	YES NO
9. Are all aqueous non-preserved samples pH 4-9 ?	<input checked="" type="radio"/> N/A	YES NO
10. Is there sufficient sample for the requested analyses?	<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?	<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?	<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact ? (not broken or leaking, etc.)	<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: <u> </u> < green pea <u> </u> > green pea	<input checked="" type="radio"/> N/A	YES NO
15. Do perchlorate LCMS-MS samples have headspace ? (at least 1/3 of container required)	<input checked="" type="radio"/> N/A	YES NO
16. Were samples checked for and free from the presence of residual chlorine ? (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	<input checked="" type="radio"/> N/A	YES NO
17. Were the samples shipped on ice ?	YES	<input checked="" type="radio"/> NO
18. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	<input checked="" type="radio"/> RAD ONLY	YES <input checked="" type="radio"/> NO
Cooler #: <u>1</u>		
Temperature (°C): <u>Amb</u>		
No. of custody seals on cooler: <u>1</u>		
DOT Survey/ Acceptance Information	External µR/hr reading: <u>14</u>	
	Background µR/hr reading: <u>13</u>	
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO / NA (If no. see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.If applicable, was the client contacted? YES / NO ☒ NA Contact: _____ Date/Time: _____Project Manager Signature / Date: JE 12/20/08

*IR Gun #2: Oakton, SN 29922500201-0066

IR Gun #4: Oakton, SN 2372220101-0002

From: Origin ID: TUSA (520) 887-1800
 Rick Smith
 URS Corporation
 333 E. Wetmore Rd
 Suite 400
 Tucson, AZ 85705



JCLS111208/20/23

SHIP TO: (907) 443-1511 BILL SENDER

Receiving-Julie Ellingson
ALS Paragon Analytics
225 Commerce Drive

Ft. Collins, CO 80524

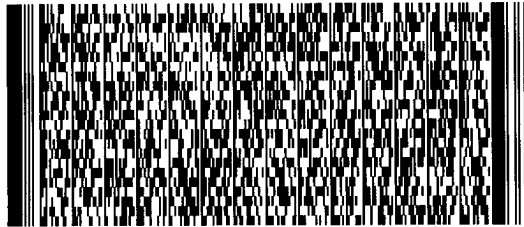
Ship Date: 16DEC08
 ActWgt: 12.5 LB
 CAD: 9880693/INET8091
 Account#: S *****

Dims: 22 X 17 X 15 IN

Delivery Address Bar Code



Ref # 24096838.54210.10013
 Invoice #
 PO #
 Dept #



LL1E180

1-7/1

4 of 4 WED - 17DEC AA
STANDARD OVERNIGHT

MPS# 7971 8719 9884

0263

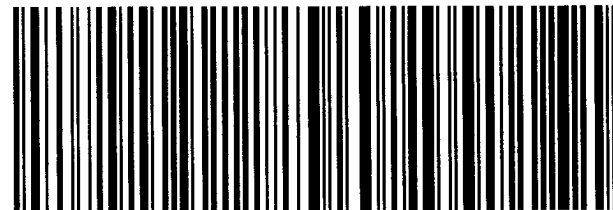
Mstr# 7971 8719 9690 0201

XH FTCA

80524

CO-US

DEN

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



Section 2



SAMPLE RESULTS SUMMARY

Radium-228 Analysis by GFPC Sample Results Summary

Client Name: Freeport McMoRan Sierrita
Client Project Name: FMI-VRP
Client Project Number:
Laboratory Name: ALS Environmental -- FC
PAI Work Order: 0812177

Page: 1 of 1
Reported on: Monday, December 03, 2012
11:40:26 AM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0812177-13	CP-P07-5-7	Sample	Ra-228	3.5 +/- 1.8	2.8	pCi/g	SOIL	RA090120-2	1/29/2009	LT

Comments:

Data Package ID: RA0812177-1

Qualifiers/Flags:

- U - Result is less than the sample specific MDC.
- LT - Result is less than Requested MDC, greater than sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 - Chemical Yield outside default limits.
- M - The requested MDC was not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

- TPU - Total Propagated Uncertainty
- MDC - Minimum Detectable Concentration
- BDL - Below Detection Limit



Section 3

QC RESULTS SUMMARY



Radium-228 Analysis by GFPC

PAI 724 Rev 10

Method Blank Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Lab ID: RA090120-2MB

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	-1.0 +/- 1.1	2.3	5	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35480	32600	ug	91.9	40 - 110 %	
YTTRIUM	8713	5400	ug	61.9	40 - 110 %	
Total				56.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Data Package ID: RA0812177-1

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Laboratory Control Sample(s)

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierra

ClientProject ID: FMI-VRP

Lab ID: RA090120-2LCS

Sample Matrix: SOIL

Prep SOP: PAI 746 Rev 8

Date Collected: 20-Jan-09

Date Prepared: 20-Jan-09

Date Analyzed: 29-Jan-09

Prep Batch: RA090120-2

QCBatchID: RA090120-2-1

Run ID: RA090120-2A

Count Time: 250 minutes

Final Aliquot: 0.504 g

Result Units: pCi/g

File Name: RAB0129

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	45.0 +/- 13.5	2.13	46.5	96.7	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	36940	33300	ug	90.0	40 - 110 %	
YTTRIUM	8713	5900	ug	67.7	40 - 110 %	
Total				60.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: RA0812177-1

Date Printed: Friday, February 13, 2009

ALS Paragon

LIMS Version: 6.244A

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Section 4

INDIVIDUAL SAMPLE RESULTS

4

Radium-228 Analysis by GFPC

PAI 724 Rev 10

Sample Results

Lab Name: ALS Paragon

Work Order Number: 0812177

Client Name: Freeport McMoRan Sierrita

ClientProject ID: FMI-VRP

Field ID: CP-P07-5-7	Sample Matrix: SOIL	Prep Batch: RA090120-2	Final Aliquot: 0.508 g
Lab ID: 0812177-13	Prep SOP: PAI 746 Rev 8	QCBatchID: RA090120-2-1	Prep Basis: Dry Weight
	Date Collected: 17-Jul-08	Run ID: RA090120-2A	Moisture(%): NA
	Date Prepared: 20-Jan-09	Count Time: 250 minutes	Result Units: pCi/g
	Date Analyzed: 29-Jan-09	Report Basis: Dry Weight	File Name: RAA0129

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
15262-20-1	Ra-228	3.5 +/- 1.8	2.8	5	LT

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	35220	32900	ug	93.4	40 - 110 %	
YTTRIUM	8713	5480	ug	62.9	40 - 110 %	
Total				58.7	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: RA0812177-1



Section 5

RAW DATA

5

Radium-228 Analysis by GFPC Raw Data Report

Laboratory Name: ALS Environmental -- FC

Prep SOP: PAI 746

Reported on: Friday, February 06, 2009

PAI Work Order: 0812177

Analytical SOP: PAI 724

8:15:34 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QC Batch ID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Aliq Analy Aliq	Inst ID Det ID	AnRunID File Name	Count Date/Time	GrossCPM BkgCPM	BaseEff ProgEff	CntDur(min) Yield	Activity +/- 2 s TPU	MDC DeclEv	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
0812177-13	RA-228 Trg. Analyte	7/17/2008 2:11:00 PM	RA090120-2 RA090120-2-1	1/27/2009 5:10:00 PM	1/29/2009 10:30:00 AM	SOIL NA	0.51 g 0.508 g	LB4100-A A3	RA090120-2A RAA0129	1/29/2009 1:05 PM	2.600 2.061	41.68% NA	250 58.7%	3.5 1.8	2.8 NA	pCi/g Dry Weight	NA NA	LT
RA090120-2	RA-228 Trg. Analyte	1/20/2009 9:41:00 AM	RA090120-2 RA090120-2-1	1/27/2009 5:10:00 PM	1/29/2009 10:30:00 AM	SOIL NA	0.506 g 0.504 g	LB4100-B C1	RA090120-2A RAB0129	1/29/2009 1:05 PM	1.412 1.576	43.86% NA	250 56.9%	-1.0 1.1	2.3 NA	pCi/g Dry Weight	NA NA	U
RA090120-2	RA-228 Trg. Analyte	1/20/2009 9:41:00 AM	RA090120-2 RA090120-2-1	1/27/2009 5:10:00 PM	1/29/2009 10:30:00 AM	SOIL NA	0.506 g 0.504 g	LB4100-B C2	RA090120-2A RAB0129	1/29/2009 1:05 PM	9.536 1.555	44.14% NA	250 60.9%	45.0 13.5	2.13 NA	pCi/g Dry Weight	NA NA	P

Comments:

Data Package ID: RA0812177-1

Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
+ - Duplicate RPD not within limits.
LT - Result is less than Request MDC, greater than sample specific MDC
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).
2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

Date Printed: Monday, December 03, 2012

ALS Environmental -- FC

LIMS Version: 6.622

Page 1 of 1

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-AW
 Counting Unit ID: Orange
 High Voltage Mode: Simultaneous
 Application Revision: C
 Application Version: PA
 Rev.12/29/03 JE

Background logfiles: BKGB
 Date of Bkg. Cal: 1/29/09
 Alpha efficiency logfile: Am241-10/08
 Alpha attenuation calibration: Am241-10/08
 Beta efficiency logfile: Sr88-10/08
 Beta attenuation calibration: Sr1008

Alpha prog. logfile: n/a
 Alpha prog. attenuation: n/a
 Beta prog. logfile: n/a
 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
$y = b \cdot m \cdot (a \cdot (m_{max} - x_0))$		$y = b \cdot m \cdot (a \cdot (m_{max} - x_0))$	
Alpha b=	1.0000	Beta b=	1.0793
m=	0.99190	m=	0.9998
a=	0.9665	a=	1.0006
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
$y = b \cdot m \cdot a \cdot x$		$y = b \cdot m \cdot a \cdot x$	
a->b xtalk b=	0.1895	b->a xtalk b=	-2.000E-06
a->b xtalk m=	0.9975	b->a xtalk m=	0.0021

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity										Beta Activity																			
					b>a xtlk					Base					Progeny					a>b xtlk					Base					Progeny				
					Gross CPM	Bkg. CPM	b-a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a-b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a-b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.									
A1	0812175-8	1/29/09 17:17	250.00	0.0	0.044	0.046	0.001	0.2095	1.100	n/a	n/a	2.572	1.991	0.0000	0.4244	1.079	n/a	n/a	n/a	n/a	n/a	n/a												
A2	0812175-11	1/29/09 17:17	250.00	0.0	0.060	0.055	0.001	0.2475	1.100	n/a	n/a	2.492	1.859	0.0090	0.4409	1.079	n/a	n/a	n/a	n/a	n/a	n/a												
A3	0812177-13	1/29/09 17:17	250.00	0.0	0.100	0.070	0.001	0.2335	1.100	n/a	n/a	2.600	2.061	0.0000	0.4168	1.079	n/a	n/a	n/a	n/a	n/a	n/a												
A4	0812178-2	1/29/09 17:17	250.00	0.0	0.140	0.088	0.002	0.2286	1.100	n/a	n/a	2.952	2.038	0.0104	0.4119	1.079	n/a	n/a	n/a	n/a	n/a	n/a												
C1	0812178-2D	1/29/09 17:18	250.00	0.0	0.060	0.048	0.001	0.2238	1.100	n/a	n/a	2.252	1.789	0.0024	0.4367	1.079	n/a	n/a	n/a	n/a	n/a	n/a												
C2	0812178-7	1/29/09 17:18	250.00	0.0	0.056	0.047	0.001	0.2609	1.100	n/a	n/a	2.284	1.677	0.0078	0.4558	1.079	n/a	n/a	n/a	n/a	n/a	n/a												
C3	0812207-7	1/29/09 17:18	250.00	0.0	0.120	0.054	0.001	0.2350	1.100	n/a	n/a	2.188	1.812	0.0132	0.4400	1.079	n/a	n/a	n/a	n/a	n/a	n/a												
C4	0812210-8	1/29/09 17:18	250.00	0.0	0.080	0.050	0.001	0.2465	1.100	n/a	n/a	2.116	1.788	0.0060	0.4321	1.079	n/a	n/a	n/a	n/a	n/a	n/a												

JP 2/5/09

Date 1/29/09SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			*				P
2	↓	↓			↓				↓
3									
4									
5	OL								
6									
7							JP	1/29/09	
8									
9	JP	P			*				P
10	↓	↓			↓				↓
11									
12									
13	OL								
14									
15							JP	1/29/09	
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA0128W			
Dr B	OL			
Dr C	BKA0128W			
Dr D	OL			

Dr = Drawer

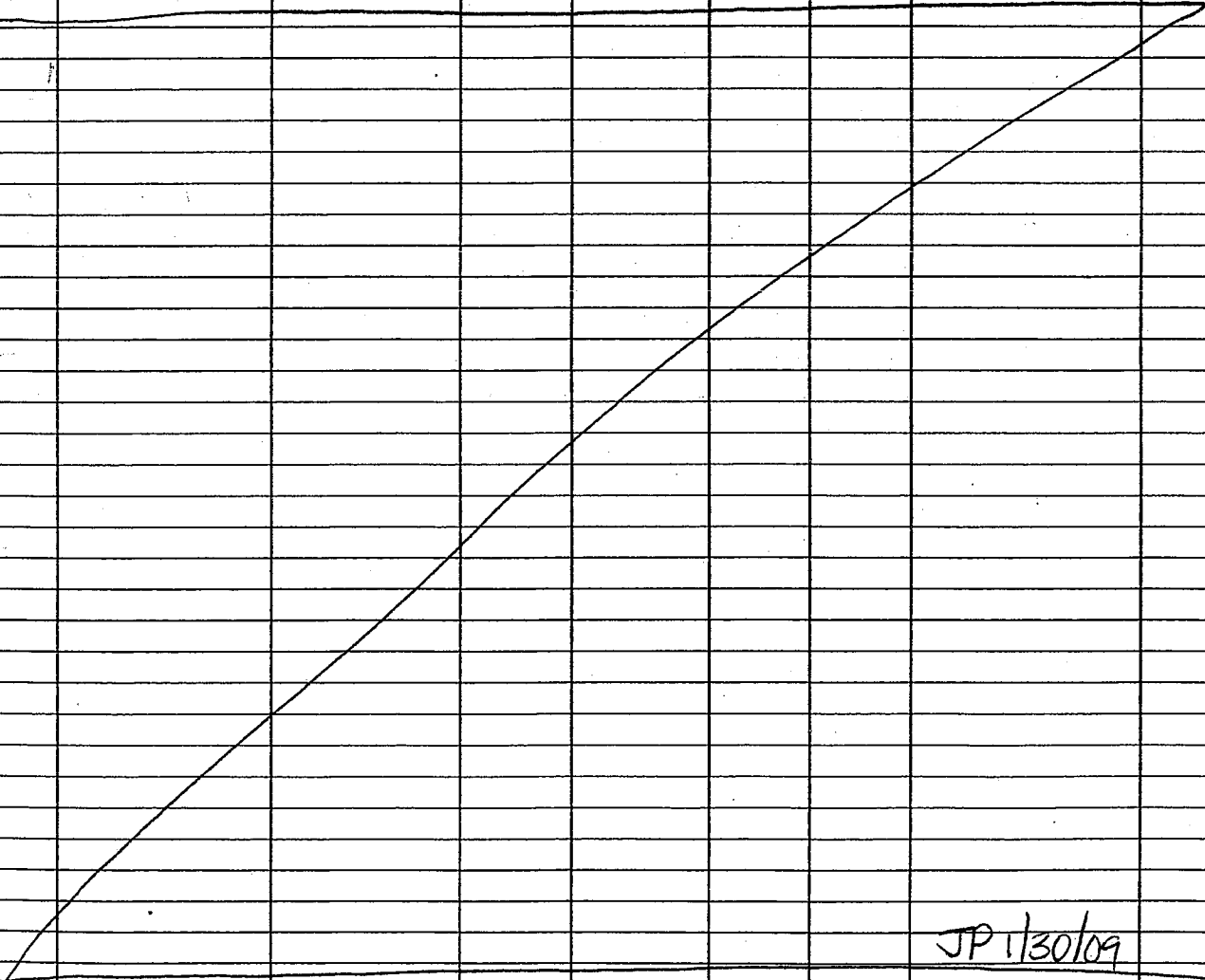
Gas Supply

	P-10 Supply	P-10 Flow
Tank 1	1050	Dr A 0.15
	↓	Dr B ↓
Tank 2	1300	Dr C ↓
	↓	Dr D ↓

Comments: *It is not necessary to run daily background checks on the morning following a weekly background calibration.

Date 1/29/09SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-49/12	Daily Eff			30	8:06	JP	FFA0129	JP
1	0901049-1	TR090113-2	Ra226	30	9:35	JP	RD40129	JP
2	↓ -2	↓	↓	↓	↓	↓	↓	↓
3	↓ -3	↓	↓	↓	↓	↓	↓	↓
4	TR090113-2MB	↓	↓	↓	↓	↓	↓	↓
9	↓ LCS	↓	↓	↓	↓	↓	↓	↓
10	↓ LCSD	↓	↓	↓	↓	↓	↓	↓
1	0812175-8	RA090120-2	Ra228	250	13:06	JP	RAA0129	JP
2	↓ -11	↓	↓	↓	↓	↓	↓	↓
3	0812177-13	↓	↓	↓	↓	↓	↓	↓
4	0812178-2	↓	↓	↓	↓	↓	↓	↓
9	↓ -20	↓	↓	↓	↓	↓	↓	↓
10	↓ -7	↓	↓	↓	↓	↓	↓	↓
11	0812207-7	↓	↓	↓	↓	↓	↓	↓
12	0812210-8	↓	↓	↓	↓	↓	↓	↓
								

JP 1/30/09

Comments:

Page No.: 370489 B
(cont. from page NA B)

Form 780r8.doc (6/23/06)

Reviewed By / Date: JP 1/30/09
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Background logfile:	BKGABW	
Date of Bkg. Cal:	12/7/09	
Alpha efficiency logfile:	Am241-11/08	Alpha prog. logfile: n/a
Alpha attenuation calibration:	AAW1119	Alpha prog. attenuation: n/a
Beta efficiency logfile:	S89-11/08	Beta prog. logfile: n/a
Beta attenuation calibration:	ASR1118	Beta prog. attenuation: n/a

Alpha Attenuation Calibration	Beta Attenuation Calibration
$y = b \cdot m^{a \cdot x} + c$	$y = b \cdot m^{a \cdot x} + c$
Alpha b = 1.15000	Beta b = 1.1002
Alpha a = 0.99000	Beta a = 0.9997
Alpha c = 0.8340	Beta c = 1.0003
Alpha x0 = 0.0000	Beta x0 = 0.0000
Alpha to Beta X-link $y = b \cdot m^{a \cdot x} + c$	Beta to Alpha X-link $y = b \cdot m^{a \cdot x} + c$
a to b link b = 0.2104	b to a link b = -2.00506
a to b link a = 0.9991	b to a link a = 0.0021

Del. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity				Beta Activity								
					Gross CPM	Bkg. CPM	b-a xtlk CPM	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a-b xtlk CPM	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	
A1	0812211-18	1/29/09 17:09	250.00	0.0	0.056	0.058	0.001	0.2343	1.150	n/a	n/a	1.888	1.544	0.0000	0.4261	n/a	n/a
A2	0812251-21	1/29/09 17:09	250.00	0.0	0.108	0.109	0.001	0.2521	1.150	n/a	n/a	2.140	1.481	0.0000	0.4406	1.100	n/a
A3	0812255-17	1/29/09 17:09	250.00	0.0	0.044	0.063	0.000	0.2539	1.150	n/a	n/a	1.620	1.433	0.0000	0.4382	1.100	n/a
A4	0812255-19	1/29/09 17:09	250.00	0.0	0.036	0.058	0.000	0.2478	1.150	n/a	n/a	1.736	1.557	0.0000	0.4295	1.100	n/a
C1	RA0901720-2MB	1/29/09 17:09	250.00	0.0	0.048	0.060	0.000	0.2357	1.150	n/a	n/a	1.412	1.576	0.0000	0.4386	1.100	n/a
C2	RA0901720-2LCS	1/29/09 17:09	250.00	0.0	0.136	0.107	0.017	0.2549	1.150	n/a	n/a	9.536	1.555	0.0061	0.4414	1.100	n/a
B1	0812258-8	1/29/09 17:10	250.00	0.0	0.068	0.077	0.003	0.2343	1.150	n/a	n/a	3.072	1.743	0.0000	0.4342	1.100	n/a
B2	0812258-8D	1/29/09 17:10	250.00	0.0	0.048	0.111	0.003	0.2510	1.150	n/a	n/a	2.860	1.551	0.0000	0.4444	1.100	n/a
B3	0812258-11	1/29/09 17:10	250.00	0.0	0.068	0.093	0.003	0.2443	1.150	n/a	n/a	1.872	1.532	0.0000	0.4309	1.100	n/a
B4	0812258-16	1/29/09 17:10	250.00	0.0	0.112	0.115	0.001	0.2407	1.150	n/a	n/a	2.324	1.653	0.0000	0.4334	1.100	n/a

JP 2/5/09

Date 1/29/09SOP 724r 10

ALS – Fort Collins
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100B

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	↓			↓	↓			↓
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15						↓			↓
16	↓	↓			↓	HB			OLB-D

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKBO126W			
Dr B	↓			
Dr C				
Dr D	↓			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1050	Dr A	0.15
	↓	Dr B	↓
Tank 2	1300	Dr C	
	↓	Dr D	↓

Comments:

Date 1/29/09SOP 724r 10

ALS - Fort Collins
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100B

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily EFF	=====	=====	30	7:48	JP	FFB0129	JP
1-16	Daily Bkg	=====	=====	60	8:04	JP	BKB0129	JP
1	0812211-18	RA090120-Z	Ra228	250	12:58	JP	RAB0129	JP
2	0812251-21	↓	↓	↓	↓	↓	↓	↓
3	0812255-17	↓	↓	↓	↓	↓	↓	↓
4	↓ -19	↓	↓	↓	↓	↓	↓	↓
5	0812258-8	↓	↓	↓	↓	↓	↓	↓
6	↓ -8D	↓	↓	↓	↓	↓	↓	↓
7	↓ -11	↓	↓	↓	↓	↓	↓	↓
8	↓ -16	↓	↓	↓	↓	↓	↓	↓
9	RA090120-2MB	↓	↓	↓	↓	↓	↓	↓
10	↓ LCS	↓	↓	↓	↓	↓	↓	↓
							JP 1/30/09	

Comments:

Radiochemistry ICP Worksheet

ALS Paragon

Prep Batch: RA090120-2

Prep Procedure: RA228

Reviewed By: MOC *for KAC* Review Date: 2/3/2009

BARIUM Recovery Results

Reference Carrier

LabID	QC Type	Car Vol	Ref Carr Dil Vol	Ref Carr ICP Alq	Ref Carr ICP Run	Ref Carr ICP Conc
RA090120-2	CAR	2	1502	1	10	IR090203-1A1 2.352481

Samples

Prep Num	LabID	QC Type	Init Samp (g)	Car Vol (ml)	Samp Dil Vol (ml)	Init ICP Alq (ml)	Init ICP Dil Vol (ml)	Pre-Con Vol (ml)	Post-Con Vol (ml)	Pre-Sep Vol (ml)	Post-Sep Vol (ml)	Fin Alq (ml)	Fin ICP Dil Vol (ml)	Initial ICP Run	Final ICP Run	Init Conc (ug/ml)	Fin ICP Conc (ug/ml)	Init Samp Mass (ug)	Ref Mass (ug)	Flag	Fin Samp Mass (ug)	% Yield	Final Sample Alq
1	0812175-8	SMP	0.5055	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.1154	0.057478	34503.23	35216.48	LB	31612.86	89.77%	0.5038
1	0812175-11	SMP	0.5091	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.11712	0.058041	35018.45	35216.48	LB	31922.32	90.65%	0.5074
1	0812177-13	SMP	0.5099	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.11696	0.059781	34971.13	35216.48	LB	32879.7	93.36%	0.5082
1	0812178-2	SMP	0.5066	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.11707	0.057531	35002.67	35216.48	LB	31641.88	89.85%	0.5049
1	0812178-2	DUP	0.5036	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.11668	0.059219	34887.02	35216.48	LB	32570.24	92.49%	0.5019
1	0812178-7	SMP	0.5083	2	40	0.1	1000	39.9	39.9	39.9	59	0.1	1000	IR090203-1A1	IR090203-1A1	0.09094	0.053891	36284.21	35245.93		31795.72	87.63%	0.5070
1	0812207-7	SMP	0.506	2	40	0.1	1000	39.9	39.9	39.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.09194	0.059307	36684.09	35245.93		32618.6	88.92%	0.5047
1	0812210-8	SMP	0.5027	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.12007	0.059008	35901.66	35216.48		32454.2	90.40%	0.5010
1	0812211-18	SMP	0.5077	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.11784	0.058164	35233.99	35216.48		31990.01	90.79%	0.5060
1	0812251-21	SMP	0.5014	2	40	0.1	1000	39.9	39.9	39.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.09190	0.058357	36670.06	35245.93		32096.39	87.53%	0.5001
1	0812255-17	SMP	0.5033	2	31	0.1	1000	30.9	30.9	30.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.11199	0.058146	37048.05	35220.28		31980.34	86.32%	0.5017
1	0812255-19	SMP	0.5094	2	25	0.1	1000	24.9	24.9	24.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.14351	0.059412	35734.04	35192.93		32676.62	91.44%	0.5074
1	0812258-8	SMP	0.5038	2	35	0.1	1000	34.9	34.9	34.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.10270	0.059148	35842.55	35233.31		32531.56	90.76%	0.5024
1	0812258-8	DUP	0.5055	2	35	0.1	1000	34.9	34.9	34.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.10244	0.058550	35750.5	35233.31		32202.77	90.08%	0.5041
1	0812258-11	SMP	0.506	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.12364	0.060942	36968.88	35216.48		33517.95	90.67%	0.5043
1	0812258-16	SMP	0.5042	2	30	0.1	1000	29.9	29.9	29.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.12190	0.060485	36448.41	35216.48		33266.52	91.27%	0.5025
1	RA090120-2	MB	0.50581	2	25	0.1	1000	24.9	24.9	24.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.14249	0.059307	35480.11	35192.93		32618.6	91.93%	0.5038
1	RA090120-2	LCS	0.50581	2	25	0.1	1000	24.9	24.9	24.9	55	0.1	1000	IR090203-1A1	IR090203-1A1	0.14836	0.060467	36942.4	35192.93		33256.85	90.02%	0.5038

Radiochemistry ICP Worksheet

ALS Paragon

Prep Batch: RA090120-2

Prep Procedure: RA228

Reviewed By: MOC/14 Ar
RUC

Review Date: 2/3/2009

YTTRIUM Recovery Results

Reference Carrier

LabID	QC Type	Carr Vol	Ref Carr Dil Vol	Ref Carr ICP Dil Vol	Ref Carr ICP Run	Ref Carr ICP Conc
RA090120-2	CAR	1	50	0.5	10	IR090203-1A1 8.713474

Samples

Prep Num	LabID	QC Type	Init Samp Alq (g)	Car Vol (ml)	Samp Dil Vol (ml)	Init ICP Dil Vol (ml)	Pre-Con Vol (ml)	Post-Con Vol (ml)	Pre-Sep Vol (ml)	Post-Sep Vol (ml)	Fin Alq (ml)	Fin ICP Dil Vol (ml)	Initial ICP Run	Final ICP Run	Init ICP Conc (ug/ml)	Fin ICP Conc (ug/ml)	Init Samp Mass (ug)	Ref Mass (ug)	Flag	Fin Samp Mass (ug)	% Yield	Final Sample Alq
1	0812175-8	SMP	0.5055	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	6.212675		8713.475		6212.675	71.30%	NA
1	0812175-11	SMP	0.5091	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.842454		8713.475		5842.454	67.05%	NA
1	0812177-13	SMP	0.5099	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.480476		8713.475		5480.476	62.90%	NA
1	0812178-2	SMP	0.5066	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	4.928844		8713.475		4792.844	55.00%	NA
1	0812178-2	DUP	0.5036	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	4.941735		8713.475		4941.735	56.71%	NA
1	0812178-7	SMP	0.5083	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.073957		8713.475		5073.957	58.23%	NA
1	0812207-7	SMP	0.506	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.463542		8713.475		5463.542	62.70%	NA
1	0812210-8	SMP	0.5027	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.774639		8713.475		5774.639	66.27%	NA
1	0812211-18	SMP	0.5077	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.21413		8713.475		5214.13	59.84%	NA
1	0812251-21	SMP	0.5014	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.988783		8713.475		5988.783	68.73%	NA
1	0812255-17	SMP	0.5033	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	4.418291		8713.475		4418.291	50.71%	NA
1	0812255-19	SMP	0.5094	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.350315		8713.475		5350.315	61.40%	NA
1	0812258-8	SMP	0.5038	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.314624		8713.475		5314.625	60.99%	NA
1	0812258-8	DUP	0.5055	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.586533		8713.475		5586.632	63.91%	NA
1	0812258-11	SMP	0.506	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.919726		8713.475		5919.727	67.94%	NA
1	0812258-16	SMP	0.5042	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.129778		8713.475		5129.778	58.87%	NA
1	RA090120-2	MB	0.50581	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.397708		8713.475		5397.708	61.95%	NA
1	RA090120-2	LCS	0.50581	1	50		50	50	50	50	0.5	10		IR090203-1A1	0	5.896003		8713.475		5896.003	67.67%	NA

[Signature]

Radiochemistry ICP Worksheet

ALS Paragon

Prep Batch: RA090120-2

Total Yield			
Prep Num	Lab ID	QC Type	Total Yield
1	0812175-8	SMP	64.00%
1	0812175-11	SMP	60.78%
1	0812177-13	SMP	58.72%
1	0812178-2	SMP	49.42%
1	0812178-2	DUP	52.45%
1	0812178-7	SMP	51.03%
1	0812207-7	SMP	55.75%
1	0812210-8	SMP	59.91%
1	0812211-18	SMP	54.33%
1	0812251-21	SMP	60.16%
1	0812255-17	SMP	43.77%
1	0812255-19	SMP	56.15%
1	0812258-8	SMP	55.36%
1	0812258-8	DUP	57.57%
1	0812258-11	SMP	61.60%
1	0812258-16	SMP	53.73%
1	RA090120-2	MB	56.95%
1	RA090120-2	LCS	60.91%

Sample Id1	Al	Ba	Ca	Fe	K	Mg	Na	Pb	Sr	Y
F 0812230-18	-0.0015	0.0511	-0.0161	-0.0193	0.0829	-0.0202	12.7845	0.0009	0.0132	-0.0027
I 0812230-19	-0.0043	0.1019	-0.0243	-0.0269	0.0700	-0.0228	1.8301	0.4661	0.0387	-0.0045
F 0812230-19	0.0017	0.0537	-0.0268	-0.0336	0.0287	-0.0204	13.1468	-0.0003	0.0161	-0.0028
CCV	47.7274	0.4781	50.8488	20.8691	18.7314	49.1959	19.1028	0.4844	0.4806	9.7934
CCB	0.0542	0.0002	0.0350	0.0009	0.0801	0.0222	0.0109	0.0038	0.0001	0.0043
I 0812230-20	0.0174	0.1045	-0.0110	-0.0280	0.0266	-0.0181	1.8620	0.4885	0.0401	-0.0024
F 0812230-20	0.0189	0.0522	-0.0231	-0.0272	0.0806	-0.0209	12.8232	-0.0012	0.0166	-0.0023
I 0812230-21	0.0270	0.1240	-0.0201	-0.0287	0.0411	-0.0217	1.8344	0.5168	0.0510	-0.0049
F 0812230-21	0.0283	0.0529	-0.0265	-0.0253	0.0251	-0.0237	12.9798	-0.0018	0.0178	-0.0024
I 0812230-22	0.0242	0.1230	-0.0195	-0.0332	0.0351	-0.0248	1.8318	0.5016	0.0491	-0.0049
F 0812230-22	0.0227	0.0520	-0.0307	-0.0390	0.0961	-0.0222	12.7921	-0.0012	0.0181	-0.0023
I 0812230-23	0.0152	0.1007	-0.0231	-0.0224	0.0752	-0.0250	1.8407	0.4122	0.0347	-0.0051
F 0812230-23	0.0182	0.0472	-0.0286	-0.0296	0.0388	-0.0237	12.7303	-0.0016	0.0145	-0.0027
I 0812230-24	0.0105	0.1027	-0.0253	-0.0374	0.0093	-0.0286	1.8747	0.4351	0.0416	-0.0054
F 0812230-24	0.0097	0.0464	-0.0240	-0.0296	0.0444	-0.0230	12.5502	-0.0016	0.0156	-0.0024
CCV	47.7372	0.4832	50.4041	20.7952	18.9779	48.8795	19.2565	0.4813	0.4844	9.7971
CCB	0.0592	0.0003	0.0359	-0.0027	0.0491	0.0204	0.0102	0.0013	0.0002	0.0051
I 0812230-25	0.0270	0.0785	-0.0082	-0.0209	0.0468	-0.0099	1.8346	0.3302	0.0401	-0.0021
F 0812230-25	0.0174	0.0483	-0.0113	-0.0207	0.0499	-0.0105	12.7789	0.0012	0.0171	-0.0008
I 0812230-26	0.0073	0.0927	-0.0207	-0.0313	0.0372	-0.0192	1.8863	0.3677	0.0429	-0.0048
F 0812230-26	0.0035	0.0487	-0.0323	-0.0402	0.0189	-0.0245	12.9486	-0.0024	0.0170	-0.0029
I 0812230-27	-0.0013	0.1081	-0.0247	-0.0341	0.0328	-0.0235	1.8514	0.4596	0.0490	-0.0050
F 0812230-27	0.0062	0.0503	-0.0265	-0.0277	0.0664	-0.0209	12.6621	0.0006	0.0194	-0.0027
I 0812230-28	0.0060	0.0821	-0.0149	-0.0339	0.0207	-0.0254	1.9380	0.3526	0.0397	-0.0052
F 0812230-28	0.0127	0.0517	-0.0283	-0.0339	0.0419	-0.0278	12.8979	-0.0009	0.0134	-0.0029
I 0812230-29	0.0013	0.0904	-0.0247	-0.0270	0.0426	-0.0207	1.8638	0.3755	0.0445	-0.0051
F 0812230-29	0.0112	0.0518	-0.0186	-0.0176	0.0098	-0.0278	12.8894	-0.0017	0.0158	-0.0033
CCV	47.6621	0.4804	50.3074	20.7334	18.8128	48.8558	19.1552	0.4773	0.4816	9.7670
CCB	0.0654	0.0002	0.0356	0.0052	0.0563	0.0198	0.0115	0.0021	0.0001	0.0048
I 0812230-30	0.0281	0.1296	-0.0143	-0.0314	0.0253	-0.0166	1.8695	0.5523	0.0696	-0.0036
F 0812230-30	0.0341	0.0523	-0.0140	-0.0314	0.0553	-0.0185	12.6454	0.0000	0.0234	-0.0022
I RA090128-1MB	0.0373	0.1242	-0.0216	-0.0261	0.0010	-0.0220	1.8258	0.5337	0.0662	-0.0042
F RA090128-1MB	0.0335	0.0498	-0.0228	-0.0280	0.0171	-0.0213	12.6930	-0.0014	0.0237	-0.0028
I RA090128-1LCS	0.0268	0.1216	-0.0310	-0.0298	0.0238	-0.0265	1.7800	0.5439	0.0630	-0.0041
F RA090128-1LCS	0.0307	0.0521	-0.0177	-0.0169	0.0189	-0.0213	12.7272	-0.0006	0.0225	-0.0029
I RA090128-1LCSD	0.0242	0.1174	-0.0216	-0.0227	0.0145	-0.0230	1.7969	0.1732	0.0270	-0.0049
F RA090128-1LCSD	0.0219	0.0520	-0.0240	-0.0333	0.0491	-0.0245	12.6672	-0.0029	0.0114	-0.0031
RA090128-1RC	0.0215	2.0853	-0.0253	-0.0350	0.0295	-0.0265	-0.0076	-0.0027	0.0002	-0.0053
Y 0812175-8	0.0234	0.0100	0.1141	-0.0010	0.0214	-0.0232	0.6246	-0.0007	0.0266	6.2127
CCV	47.8961	0.4816	50.0672	20.6699	19.0321	48.7262	19.3855	0.4782	0.4822	9.7355
CCB	0.0727	0.0004	0.0417	0.0002	0.0132	0.0282	0.0114	0.0012	0.0002	0.0068
Y 0812175-11	0.0202	0.0035	0.1035	0.0118	0.0101	-0.0187	0.5378	-0.0022	0.0135	5.8425
0812177-13	0.0167	0.0015	0.0904	0.0186	0.0532	-0.0230	0.3560	-0.0004	0.0099	5.4805
Y 0812178-2	0.0200	0.0043	0.0794	0.0047	0.0313	-0.0263	0.3059	-0.0005	0.0150	4.7928

12090203-1A1

Sample Id1	Al	Ba	Ca	Fe	K	Mg	Na	Pb	Sr	Y
CCV	49.8708	0.4943	50.3926	20.5854	19.7620	50.0370	20.2440	0.4859	0.4952	9.9086
CCB	0.0289	0.0001	0.0134	-0.0070	0.0070	0.0103	0.0129	0.0028	0.0001	0.0042
I 0812175-8	0.0090	0.1154	-0.0082	0.0007	0.0171	-0.0099	2.0124	0.4228	0.0500	-0.0016
F 0812175-8	0.0058	0.0575	-0.0225	-0.0182	0.0266	-0.0129	13.3816	-0.0015	0.0126	-0.0012
I 0812175-11	-0.0062	0.1171	-0.0195	-0.0148	0.0302	-0.0133	1.9782	0.4862	0.0513	-0.0025
F 0812175-11	-0.0086	0.0580	-0.0225	-0.0193	0.0204	-0.0161	13.5532	-0.0010	0.0185	-0.0008
I 0812177-13	-0.0120	0.1170	-0.0259	-0.0178	-0.0013	-0.0198	2.0017	0.4821	0.0527	-0.0030
F 0812177-13	-0.0171	0.0598	-0.0113	-0.0288	0.0297	-0.0192	13.7165	-0.0014	0.0204	-0.0009
I 0812178-2	-0.0165	0.1171	-0.0256	-0.0324	0.0346	-0.0168	1.9998	0.4948	0.0519	-0.0035
F 0812178-2	-0.0189	0.0575	-0.0256	-0.0269	0.0406	-0.0174	13.3121	-0.0001	0.0182	-0.0001
I 0812178-2D	-0.0227	0.1167	-0.0225	-0.0250	0.0602	-0.0157	2.3262	0.4593	0.0511	-0.0026
F 0812178-2D	0.0000	0.0592	-0.0204	-0.0209	0.0214	-0.0189	13.5924	-0.0017	0.0174	0.0075
CCV	49.9148	0.4966	50.4918	20.6768	19.6912	50.2002	20.0843	0.4844	0.4958	9.9433
CCB	0.0172	0.0001	0.0116	0.0043	-0.0134	0.0095	0.0165	0.0000	0.0001	0.0035
I 0812178-7	0.0028	0.0909	-0.0030	-0.0173	0.0109	-0.0095	2.0685	0.4226	0.0437	-0.0016
F 0812178-7	-0.0024	0.0539	-0.0225	-0.0205	0.0127	-0.0131	13.5514	-0.0020	0.0147	0.0005
I 0812207-7	0.0101	0.0919	0.1236	-0.0260	-0.0083	-0.0116	2.1067	0.3757	0.0377	-0.0034
F 0812207-7	0.0045	0.0593	-0.0247	-0.0278	-0.0044	-0.0194	13.8208	-0.0022	0.0121	-0.0013
I 0812210-8	0.0062	0.1201	-0.0228	-0.0138	-0.0137	-0.0183	2.0392	0.4932	0.0541	-0.0013
F 0812210-8	0.0043	0.0590	-0.0253	-0.0280	-0.0289	-0.0228	13.5915	-0.0002	0.0184	-0.0025
I 0812211-18	0.0032	0.1178	-0.0231	-0.0114	-0.0041	-0.0155	2.0088	0.5043	0.0524	-0.0028
F 0812211-18	0.0041	0.0582	-0.0213	-0.0328	-0.0062	-0.0183	13.3549	-0.0012	0.0184	-0.0015
I 0812251-21	0.0886	0.0919	-0.0253	-0.0211	0.0121	-0.0207	2.0744	0.7979	0.0449	-0.0036
F 0812251-21	-0.0028	0.0584	-0.0253	-0.0290	-0.0155	-0.0211	13.4083	-0.0009	0.0165	-0.0027
CCV	49.3214	0.4931	50.3061	20.6148	19.4794	49.9623	19.8599	0.4887	0.4931	9.9009
CCB	0.0152	0.0001	0.0119	0.0060	-0.0129	0.0088	0.0178	0.0004	0.0001	0.0034
I 0812255-17	-0.0167	0.1199	-0.0173	-0.0210	0.0284	-0.0136	2.0522	0.7771	0.0604	-0.0017
F 0812255-17	-0.0141	0.0581	-0.0219	-0.0235	0.0318	-0.0174	13.5061	-0.0003	0.0206	0.0011
I 0812255-19	-0.0143	0.1435	-0.0250	-0.0287	0.0000	-0.0187	2.0540	0.6037	0.0706	-0.0026
F 0812255-19	-0.0058	0.0594	-0.0283	-0.0365	-0.0251	-0.0220	13.6649	-0.0021	0.0230	-0.0015
I 0812258-8	-0.0113	0.1027	-0.0234	0.0221	-0.0357	-0.0209	2.0553	0.4174	0.0438	-0.0036
F 0812258-8	-0.0105	0.0591	-0.0283	-0.0211	-0.0367	-0.0226	14.0332	-0.0022	0.0163	-0.0013
I 0812258-8D	-0.0002	0.1024	-0.0256	-0.0195	-0.0468	-0.0224	2.0718	0.4283	0.0420	-0.0039
F 0812258-8D	0.0024	0.0586	-0.0295	-0.0410	-0.0532	-0.0263	13.8589	-0.0022	0.0145	-0.0020
I 0812258-11	0.0007	0.1236	-0.0265	-0.0298	-0.0587	-0.0217	2.0641	0.5109	0.0526	-0.0032
F 0812258-11	0.0058	0.0609	-0.0243	-0.0255	-0.0680	-0.0273	14.1888	-0.0024	0.0179	-0.0029
CCV	51.7046	0.5189	51.0079	21.2247	20.6012	51.2075	20.7491	0.5006	0.5158	10.2095
CCB	0.0405	0.0002	0.0149	0.0001	-0.0610	0.0127	0.0198	-0.0013	0.0002	0.0042
I 0812258-16	0.0082	0.1219	-0.0161	-0.0142	-0.0189	-0.0095	2.0223	0.5157	0.0548	-0.0004
F 0812258-16	0.0167	0.0605	-0.0116	-0.0227	-0.0248	-0.0155	13.8196	-0.0026	0.0193	-0.0005
I FA090120-2MB	-0.0049	0.1425	-0.0240	-0.0279	-0.0090	-0.0177	2.0703	0.2346	0.0370	-0.0039
F FA090120-2MB	-0.0060	0.0593	-0.0265	-0.0244	-0.0059	-0.0211	13.7937	-0.0041	0.0124	-0.0023
I FA090120-2LCS	-0.0058	0.1484	-0.0134	-0.0229	-0.0147	-0.0211	2.0926	0.5765	0.0725	-0.0024
F FA090120-2LCS	-0.0043	0.0605	-0.0213	-0.0365	-0.0090	-0.0224	13.9530	-0.0010	0.0225	-0.0027

Sample Id1	Al	Ba	Ca	Fe	K	Mg	Na	Pb	Sr	Y
RA090120-2RC	0.0356	2.3525	-0.0030	-0.0229	0.0072	-0.0172	0.0055	0.0024	0.0019	-0.0050
I 0811058-1	92.3506	1.1486	76.2181	43.6742	34.6697	19.8693	17.3510	0.6001	0.4553	0.0643
F 0811058-1	0.0881	0.0193	17.8694	0.0429	-0.0388	0.0028	8.3816	0.8630	0.0500	-0.0051
I 0811058-1D	88.1027	1.1112	71.7984	40.7593	33.3334	18.7333	16.3527	0.5946	0.4349	0.0606
CCV	51.9087	0.5241	52.1036	21.6147	20.7149	51.9128	20.6740	0.5035	0.5211	10.3900
CCB	0.0390	0.0006	0.0310	0.0096	-0.0488	0.0159	0.0206	0.0003	0.0003	0.0050
F 0811058-1D	0.0408	0.0103	17.8862	-0.0022	-0.0708	-0.0080	6.8172	0.9202	0.0300	-0.0036
I 0811058-1MS	92.9172	1.1621	76.1901	43.4176	34.9123	19.8573	17.5706	0.6078	0.4615	0.0655
F 0811058-1MS	0.1964	0.0095	17.1305	0.0677	-0.0411	0.0288	8.5198	0.9190	0.0251	-0.0043
I 0811058-1MSD	90.3916	1.1522	72.4884	43.1428	34.3375	18.8097	17.5189	0.5945	0.4469	0.0628
F 0811058-1MSD	0.2157	0.0154	17.5818	0.0819	-0.0535	0.0269	7.4126	0.8923	0.0386	-0.0046
I 0811058-2	90.9783	1.1396	72.9872	42.7168	34.7571	19.1192	17.4995	0.5986	0.4519	0.0620
F 0811058-2	0.1486	0.0143	17.7322	0.0603	-0.0512	0.0121	9.9234	0.8926	0.0436	-0.0049
XXXX	86.3782	1.0210	49.5876	43.7635	33.2192	17.2638	16.2385	0.5753	0.3566	0.0373
XXXXX	4.3504	0.0671	4.8305	3.5757	2.6463	1.3084	0.5516	0.1203	0.0225	-0.0009
XXXXXX	-0.1060	0.0019	-0.0511	1-0.1079	0.9971	0.1188	-0.0167	0.0134	-0.0008	-0.0020
I 0811058-3	78.6282	0.9363	44.8228	39.5115	30.6654	15.6618	15.0869	0.5327	0.3267	0.0340
F 0811058-3	0.1312	0.0171	16.1261	0.0421	0.0328	0.0045	5.0569	0.7349	0.0498	-0.0052
I 0811058-3D	82.6965	1.0018	49.9966	39.9303	32.0842	16.4272	16.0390	0.5393	0.3527	0.0387
CCV	47.6731	0.4765	48.1785	19.9055	19.1419	47.7600	19.5061	0.4629	0.4763	9.5119
CCB	0.0427	0.0002	0.0082	0.0044	0.0238	-0.0013	0.0031	0.0014	0.0000	-0.0002
F 0811058-3D	0.0613	0.0116	16.2506	-0.0028	0.0413	0.0022	12.1039	0.8149	0.0318	-0.0029
I 0811058-3MS	80.8944	0.9450	48.2600	41.3505	30.4254	15.9041	15.3056	0.5271	0.3337	0.0378
F 0811058-3MS	0.1730	0.0133	16.3206	0.0602	0.0731	0.0142	8.9600	0.8140	0.0325	-0.0046
I 0811058-3MSD	83.3368	0.9919	49.7985	40.1703	31.4158	16.7970	15.8563	0.5348	0.3462	0.0383
F 0811058-3MSD	0.0652	0.0125	16.5175	0.0119	0.0907	0.0073	4.9205	0.7508	0.0386	-0.0050
I 0811058-4	80.3457	0.9342	47.6018	40.8593	30.4714	15.7044	14.9519	0.5322	0.3297	0.0362
F 0811058-4	0.1638	0.0126	16.5553	0.0647	0.0956	0.0166	6.0830	0.8644	0.0363	-0.0051
I 0811058-6	83.0136	1.0041	71.8675	40.7500	30.5370	17.5378	15.3245	0.5619	0.4060	0.0592
F 0811058-6	0.1226	0.0115	16.8973	0.0483	0.0930	0.0082	5.1224	0.8837	0.0360	-0.0052
I 0811058-7	77.5268	0.8916	36.8679	42.8743	30.3647	13.8936	13.8971	0.5473	0.2879	0.0272
CCV	47.3220	0.4744	49.3791	20.2708	18.7014	48.3325	19.1752	0.4637	0.4752	9.5949
CCB	0.0504	0.0003	0.0180	0.0137	0.0788	0.0030	0.0053	0.0029	0.0000	0.0004
F 0811058-7	0.0697	0.0127	17.0042	-0.0010	0.0527	0.0006	3.4427	0.7854	0.0376	-0.0026
I 0811145-1	37.3560	0.6553	180.4362	24.9923	20.4093	7.0407	8.5646	0.5957	0.7000	0.1393
F 0811145-1	0.0960	0.0057	17.3116	0.0216	0.0796	-0.0028	3.6856	0.8296	0.0317	-0.0043
I 0811145-2	72.3854	1.1108	91.8625	35.4624	28.0406	12.2231	12.4277	0.5760	0.4068	0.0763
F 0811145-2	0.1222	0.0124	16.8955	0.0234	0.0899	-0.0009	11.4878	0.9211	0.0297	-0.0049
I 0811145-3	34.9573	0.5326	174.0441	24.6719	19.1820	6.6572	8.1451	0.5708	0.6773	0.1303
F 0811145-3	0.0814	0.0052	17.1299	0.0163	0.0917	-0.0050	6.6163	0.8042	0.0334	-0.0047
I 0811145-3D	37.0285	0.5434	179.9152	25.1156	20.4033	6.9105	8.5035	0.5873	0.6960	0.1368
F 0811145-3D	0.0866	0.0057	17.2848	0.0313	0.1023	-0.0052	4.0786	0.7214	0.0313	-0.0048
I 0811145-3MS	35.7338	0.5421	176.2329	27.5828	19.6339	6.8150	8.1023	0.5734	0.6807	0.1328
CCV	47.1729	0.4707	49.9169	20.3916	18.5291	48.4772	18.9845	0.4655	0.4724	9.6044

Sample Id1	Al	Ba	Ca	Fe	K	Mg	Na	Pb	Str	Y
Y 0812178-2D	0.0071	0.0007	0.0743	0.0016	0.0491	-0.0230	0.3216	-0.0012	0.0058	4.9417
Y 0812178-7	0.0109	0.0014	0.0861	0.0058	0.0377	-0.0232	0.3229	-0.0009	0.0067	5.0740
Y 0812207-7	0.0112	0.0005	0.0892	0.0144	0.0390	-0.0202	0.3872	-0.0017	0.0055	5.4635
Y 0812210-8	0.0082	0.0027	0.0959	0.0146	0.0400	-0.0226	0.4964	-0.0030	0.0147	5.7746
Y 0812211-18	0.0086	0.0036	0.0849	0.0178	0.0581	-0.0248	0.4214	-0.0014	0.0171	5.2141
Y 0812251-21	0.0052	0.0024	0.1013	0.0085	0.0227	-0.0226	0.5998	-0.0030	0.0180	5.9888
Y 0812255-17	0.0146	0.0020	0.0670	0.0006	0.0328	-0.0237	0.4602	-0.0023	0.0203	4.4183
CCV	48.6274	0.4897	50.6056	20.9868	19.2791	49.3995	19.6430	0.4817	0.4899	9.8997
CCB	0.0770	0.0003	0.0450	0.0103	0.0202	0.0276	0.0087	0.0017	0.0002	0.0083
Y 0812255-19	0.0279	0.0040	0.0916	0.0221	0.0181	-0.0159	0.5656	-0.0010	0.0269	5.3503
Y 0812258-8	0.0294	0.0006	0.0779	0.0136	0.0331	-0.0217	0.3784	-0.0016	0.0058	5.3146
Y 0812258-8D	0.0356	0.0015	0.0837	0.0178	0.0186	-0.0198	0.4093	-0.0004	0.0112	5.5686
Y 0812258-11	0.0382	0.0049	0.0880	0.0231	0.0393	-0.0202	0.6435	-0.0020	0.0241	5.9197
Y 0812258-16	0.0341	0.0071	0.0749	0.0057	0.0129	-0.0226	0.2434	-0.0021	0.0292	5.1298
Y RA090120-2MB	0.0307	0.0041	0.0752	0.0154	0.0313	-0.0194	0.3716	-0.0013	0.0146	5.3977
Y RA090120-2LCS	0.0296	0.0024	0.0846	0.0128	0.0315	-0.0220	0.4271	-0.0022	0.0182	5.8960
RA090120-2RC	0.0279	-0.0005	0.1433	-0.0261	0.0295	-0.0252	-0.0236	-0.0008	-0.0004	8.7135
Y 0812230-17	0.0335	0.0024	0.1099	0.0058	0.0400	-0.0245	0.7737	-0.0025	0.0182	6.6862
Y 0812230-18	0.0317	0.0046	0.1035	0.0013	0.0310	-0.0250	0.6899	-0.0016	0.0219	6.4527
CCV	47.9717	0.4812	51.0679	20.9834	18.9854	49.0381	19.4041	0.4876	0.4832	9.8144
CCB	0.0748	0.0003	0.0460	0.0122	0.0723	0.0282	0.0089	0.0005	0.0002	0.0088
Y 0812230-19	0.0245	0.0015	0.1150	-0.0152	0.0362	-0.0252	0.6787	-0.0005	0.0160	6.7050
Y 0812230-20	0.0204	0.0024	0.1163	-0.0081	0.0723	-0.0230	0.6471	-0.0017	0.0170	6.7012
Y 0812230-21	0.0223	0.0017	0.1315	-0.0082	0.0313	-0.0256	0.6248	-0.0015	0.0164	6.5475
Y 0812230-22	0.0161	0.0006	0.1068	-0.0030	0.0677	-0.0224	0.6258	-0.0014	0.0098	6.3916
Y 0812230-23	0.0163	0.0010	0.1083	0.0143	0.0375	-0.0280	0.6111	-0.0015	0.0116	6.4374
Y 0812230-24	0.0105	0.0019	0.1114	0.0176	0.0752	-0.0248	0.5846	-0.0015	0.0175	6.0673
Y 0812230-25	0.0165	0.0038	0.1117	0.0273	0.0641	-0.0222	0.5978	-0.0023	0.0252	6.2183
Y 0812230-26	0.0112	0.0009	0.1120	0.0214	0.0375	-0.0254	0.6229	-0.0019	0.0114	6.4406
Y 0812230-27	0.0144	0.0020	0.1138	0.0180	0.0509	-0.0258	0.6042	-0.0023	0.0167	6.3277
Y 0812230-28	0.0193	0.0019	0.1172	-0.0036	0.0517	-0.0232	0.6534	-0.0023	0.0138	6.3973
CCV	48.5908	0.4853	51.1099	21.0419	19.1729	49.4522	19.5919	0.4883	0.4864	9.8964
CCB	0.0857	0.0003	0.0484	0.0019	0.0429	0.0316	0.0100	-0.0002	0.0003	0.0116
Y 0812230-29	0.0283	0.0033	0.1074	0.0283	0.0574	-0.0196	0.6375	-0.0011	0.0201	6.2316
Y 0812230-30	0.0294	0.0040	0.1013	0.0170	0.0535	-0.0224	0.6267	-0.0021	0.0342	6.2618
Y RA090128-1MB	0.0354	0.0040	0.0959	0.0146	0.0543	-0.0220	0.6929	-0.0011	0.0424	6.3147
Y RA090128-1LCS	0.0498	0.0049	0.0956	0.0263	0.0248	-0.0222	0.6786	-0.0030	0.0397	6.1723
Y RA090128-1LCSD	0.0388	0.0036	0.0959	0.0135	0.0297	-0.0239	0.7308	-0.0001	0.0112	6.4584
RA090128-1RC	0.0332	-0.0005	0.1412	-0.0271	0.0320	-0.0263	-0.0262	-0.0021	-0.0004	8.7760
CCV	47.7346	0.4829	50.5977	20.9034	18.9510	48.6466	19.3936	0.4759	0.4834	9.8119
CCB	0.0911	0.0003	0.0447	0.0077	0.0194	0.0293	0.0084	0.0023	0.0003	0.0098



Section 6

QUALITY ASSURANCE SUMMARY REPORTS

6



No *NON-CONFORMANCE REPORTS* or *QUALITY ASSURANCE SUMMARY SHEETS* are included in this data package.



Section 7

LABORATORY BENCH SHEETS



Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: RA090120-2

Prep Procedure: RA228

Analytical QASS / NCR? Y NA

Prep Num	LabID	QC Type	Init Aliq	Fin Aliq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Ins/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Ins/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Ins/Det	Cnt 3 Pos Chk By	Notes
1	0812175-8	SMP	0.5055	0.5038	g	PCI/G		RA0129	1	JP							
1	0812175-11	SMP	0.5091	0.5074	g	PCI/G		2									
1	0812177-13	SMP	0.5099	0.5082	g	PCI/G		3									
1	0812178-2	SMP	0.5066	0.5049	g	PCI/G		4									
1	0812178-2	DUP	0.5036	0.5019	g	PCI/G		9									
1	0812178-7	SMP	0.5083	0.5070	g	PCI/G		10									
1	0812207-7	SMP	0.506	0.5047	g	PCI/G		11									
1	0812210-8	SMP	0.5027	0.5010	g	PCI/G		12									
1	0812211-18	SMP	0.5077	0.5060	g	PCI/G		RA0129	1	JP							
1	0812251-21	SMP	0.5014	0.5001	g	PCI/G		2									
1	0812255-17	SMP	0.5033	0.5017	g	PCI/G		3									
1	0812255-19	SMP	0.5094	0.5074	g	PCI/G		4									
1	0812258-8	SMP	0.5038	0.5024	g	PCI/G		5									
1	0812258-8	DUP	0.5055	0.5041	g	PCI/G		6									
1	0812258-11	SMP	0.506	0.5043	g	PCI/G		7									
1	0812258-16	SMP	0.5042	0.5025	g	PCI/G		8									
1	RA090120-2	MB	0.5058	0.5038	g	PCI/G		9									
1	RA090120-2	LCS	0.5058	0.5038	g	PCI/G		10									

JP 2/6/09

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Ra-228	784.3020.38	52.388	DPM/ml	01/20/09	RS-006

Tracer/Carrier Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
T1	YTTRIUM	247972	9,003.586	ppm	NA	RS-006
T2	BARIIUM	247973	16,023.752	ppm	NA	RS-009

Radiochemistry Instrument Worksheet

ALS Paragon

Prep Batch: RA090120-2

Reporting Units

LabID:	TstGrpName:	RptUnits:
0812178-2	Ra228	PCI/G
0812207-7	Ra228	PCI/G
0812178-7	Ra228	PCI/G
0812258-8	Ra228	PCI/G
0812210-8	Ra228	PCI/G
0812175-8	Ra228	PCI/G
0812258-11	Ra228	PCI/G
0812175-11	Ra228	PCI/G
0812177-13	Ra228	PCI/G
0812258-16	Ra228	PCI/G
0812255-17	Ra228	PCI/G
0812211-18	Ra228	PCI/G
0812255-19	Ra228	PCI/G
0812251-21	Ra228	PCI/G

Sample Barcodes

0812175-8 RA090120-2PS1		0812175-11 RA090120-2PS2	
0812177-13 RA090120-2PS3		0812178-2 RA090120-2PS4	
0812178-2DUP RA090120-2PS5		0812178-7 RA090120-2PS6	
0812207-7 RA090120-2PS7		0812210-8 RA090120-2PS8	
0812211-18 RA090120-2PS9		0812251-21 RA090120-2PS10	
0812255-17 RA090120-2PS11		0812255-19 RA090120-2PS12	
0812258-8 RA090120-2PS13		0812258-8DUP RA090120-2PS14	
0812258-11 RA090120-2PS15		0812258-16 RA090120-2PS16	
0812258-16 RA090120-2PS17		0812258-18 RA090120-2PS18	
0812258-18 RA090120-2PS19			

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: RA090120-2

Prep Procedure: RA228

Reviewed By: JPK Review Date: 2/5/2009

Non-Routine Pre-Treatment? Y / ☒ Batch: 14

Re-Prep? Y / ☒

Batch: 14

Prep QASS / NCR? Y / ☒

Prep Notes

Prep SOP: PAI 746 Rev: 8

Prep SOP: NONE

Matrix Class: solid

Prep Analyst: Melissa Cromer

Prep Date: 1/20/2009

Prep Dept: RS

Balance:

Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Aliq g	Fin Aliq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0812175-8	SMP		0.5065	0.503815	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
2	1	0812175-11	SMP		0.5091	0.507403	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
3	1	0812177-13	SMP		0.5099	0.508200	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
4	1	0812178-2	SMP		0.5066	0.504911	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
5	1	0812178-2	DUP		0.5036	0.501921	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
6	1	0812178-7	SMP		0.5083	0.507029	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
7	1	0812207-7	SMP		0.506	0.504735	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
8	1	0812210-8	SMP		0.5027	0.501024	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
9	1	0812211-18	SMP		0.5077	0.506008	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
10	1	0812251-21	SMP		0.5014	0.500147	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
11	1	0812255-17	SMP		0.5033	0.501676	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
12	1	0812255-19	SMP		0.5084	0.507362	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
13	1	0812258-8	SMP		0.5038	0.502351	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
14	1	0812258-8	DUP		0.5065	0.504056	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
15	1	0812258-11	SMP		0.506	0.504313	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
16	1	0812258-16	SMP		0.5042	0.502519	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
17	1	RA090120-2	MB		0.505813	0.503789	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2	
18	1	RA090120-2	LCS		0.505813	0.503789	Dry Weight	01/27/09 17:10	01/29/09 10:30	T1,T2,S1	

Comments

Spiked By: Melissa Cromer

Date: 1/21/2009

Yttrium Added By: Melissa Cromer

Date: 1/27/2009

Witnessed By: Jeff Kujawa

Date: 1/21/2009

Witnessed By: Jeff Kujawa

Date: 1/27/2009

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	YTTRIUM	247972	9,003.596	ppm	NA	1	ppm	RS-006
T2	BARIIUM	247973	16,023.752	ppm	NA	2	ppm	RS-009

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Ra-228	784.3020.38	52.388	DPM/ml	01/20/09	1	ml	RS-006

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Page 4 of 1 RA228 Bench Sheet

Date Printed: 2/5/2009 17:44

ALS Paragon

LIMS Version: 6.242A

Supersedes: 7/3/08 1/21/09 9:21

965 265/05

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: RA090120-2

Prep Batch Not Validated!!!

Prep Procedure: RA228

Reviewed By: _____ Review Date: _____

Non-Routine Pre-Treatment? Y / N Batch: _____

Prep QASS / NCR? Y / N

Prep SOP: PAI 746 Rev: 8

Prep SOP: NONE

Matrix Class: solid

Prep Analyst: Melissa Cromer

Prep Date: 1/20/2009

Prep Dept: RS

Balance: _____

Balance: _____

Sample Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0812175-8	SMP		0.5055	0.5055	Dry Weight	12/10/09 12:10	1/21/09 10:30	T1, T2	30
2	1	0812175-11	SMP		0.5091	0.5091	Dry Weight			T1, T2	
3	1	0812177-13	SMP		0.5099	0.5099	Dry Weight			T1, T2	
4	1	0812178-2	SMP		0.5066	0.5066	Dry Weight			T1, T2	
5	1	0812178-2	DUP		0.5036	0.5036	Dry Weight			T1, T2	
6	1	0812178-7	SMP		0.5083	0.5083	Dry Weight			T1, T2	40
7	1	0812207-7	SMP		0.506	0.506	Dry Weight			T1, T2	
8	1	0812210-8	SMP		0.5027	0.5027	Dry Weight			T1, T2	32
9	1	0812211-18	SMP		0.5077	0.5077	Dry Weight			T1, T2	
10	1	0812251-21	SMP		0.5014	0.5014	Dry Weight			T1, T2	40
11	1	0812255-17	SMP		0.5033	0.5033	Dry Weight			T1, T2	31
12	1	0812255-19	SMP		0.5094	0.5094	Dry Weight			T1, T2	29
13	1	0812258-8	SMP		0.5038	0.5038	Dry Weight			T1, T2	35
14	1	0812258-8	DUP		0.5055	0.5055	Dry Weight			T1, T2	
15	1	0812258-11	SMP		0.506	0.506	Dry Weight			T1, T2	30
16	1	0812258-16	SMP		0.5042	0.5042	Dry Weight			T1, T2	
17	1	RA090120-2	MB		0.505813	0.505813	Dry Weight			T1, T2	29
18	1	RA090120-2	LCS		0.505813	0.505813	Dry Weight			T1, T2, S1	

Comments

Spiked By: YVCC Date: 1/21/09

Witnessed By: YVCC Date: 1/21/09

Yttrium Added By: YVCC Date: 1/27/09

Witnessed By: YVCC Date: 1/27/09

Trace/Carrier Solution Information									
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID	
T1	YTTRIUM	247972	9,003.596	ppm	NA	1	ppm	RS-006	
T2	BARIUM	247973	16,023.752	ppm	NA	2	ppm	RS-009	

Spike Solution Information									
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID	
S1	Ra-228	784.3020.38	52.388	DPM/ml	01/20/09	1	ml	RS-006	

37 of 2

Radiochemistry Prep Worksheet

ALS Paragon

Prep Batch: DG090105-3

Prep Procedure: Dry_Grind

Reviewed By: sdw *sm* Review Date: 1/6/2009

Non-Routine Pre-Treatment? Y *(N)* Batch: *MT* Re-Prep? Y *(N)* Prep QASS / NCR? Y *(N)* *MT*

Prep SOP: SOP336 Rev: 0

Prep SOP: NONE

Matrix Class: solid

Prep Analyst: Steven D. White *sm*

Prep Date: 1/5/2009

Prep Dept: GP

Balance: 15

Balance:

Oven Num: 18

Oven In Date: 12/19/2008 3:55:00 PM

Oven Out Date: 12/24/2008 1:00:00 PM

Sample Num	Prep Num	LabID	QC Type	Dish No.	Tare g	Gross g	Net g	Prep Notes
1	1	0812177-1	SMP		98.8	133.3	34.5	
2	1	0812177-2	SMP		98.8	152.1	53.3	
3	1	0812177-3	SMP		99.1	125.1	27	
4	1	0812177-4	SMP		99.1	132.7	33.6	
5	1	0812177-5	SMP		98.5	220.6	122.1	
6	1	0812177-6	SMP		99.1	220.1	121	
7	1	0812177-7	SMP		98.6	121.5	22.9	
8	1	0812177-8	SMP		98.2	154.5	56.3	
9	1	0812177-9	SMP		99.5	141.4	41.9	
10	1	0812177-10	SMP		98.8	165	66.2	<i>1-6-09</i>
11	1	0812177-11	SMP		98.3	110.8	12.5	
12	1	0812177-12	SMP		98.7	118.8	20.1	
13	1	0812177-13	SMP		98.4	181.9	83.5	
14	1	0812177-14	SMP		99.1	111.1	12	
15	1	0812177-15	SMP		98.4	110.5	12.1	
16	1	0812177-16	SMP		98.9	115	16.1	
17	1	0812177-17	SMP		98.5	145.2	47.7	
18	1	0812177-18	SMP		98.2	147.5	49.3	
19	1	0812177-19	SMP		99.3	134.8	35.5	
20	1	0812177-20	SMP		98.3	134.2	35.9	

Comments

Spiked By: N/A Date: N/A

Witnessed By: N/A Date: N/A

SAMPLE CONDITION FORM (SOLIDS)

ANALYST: JH

ANALYSIS DATE: 2/5/09

METHOD: 728 *hu*

WORK ORDER	SAMPLE ID	SAMPLE CONDITION		
		Dry/Wet	TEXTURE	Remarks
0812175	8	Dry	Gravel	None
+	11			
0812177	13			
0812178	2			
+	7			
0812207	7			
0812210	8			
0812211	18			
0812251	21			
0812255	17			
+	19			
0812258	8			
	11			
+	16			
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> 1/24 2/5/09 </div>				



Section 8

STANDARDS TRACEABILITY DOCUMENTS



Stable Chemistry Solution Report

Solution Id: 247972	Name: Yttrium Carrier<7>	Type: IS
Lot: multiple	Vendor Name: multiple	

Final Vol: 1000	Dept: RS	Prep By MOC	on	10/15/2008	Reviewed By JRK	on	10/16/2008
Units: mL	Location: SR/RA	Opened By	on		Verified By MOC	on	10/16/2008
Matrix: LIQUID	ExpireDate: 10/16/2009	Received By	on		Deactivated By	on	

Comment:

Component Name	Component ID	Volume Added	Units
Yttrium Oxide<1>	FA991208	11.4335	g

Constituent Name	Conc of Primary Soln	FinalConc	Summed Conc	Units
YTTRIUM	787475	9003.596		ppm

Associated Parent IDs

FA991208

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
NE = Not Entered

Date Printed: Tuesday, October 28, 2008
A Division of Datachem Laboratories

Paragon Analytics Inc.
Standards DB Version: 1.09

Stable Chemistry Solution Report

Solution Id: 247974	Name: Barium Carrier (BaCl2 in DI and HNO3)<23>	Type: IR
Lot: multiple	Vendor Name: multiple	

Final Vol: 1000	Dept: RS	Prep By MOC	on	12/29/2008	Reviewed By JRK	on	12/30/2008
Units: mL	Location: SR/RA	Opened By	on		Verified By	on	
Matrix: WATER	ExpiredDate: 12/30/2009	Received By	on		Deactivated By	on	

Comment:

Component Name	Component ID	Volume Added	Units
BARIUM CHLORIDE<2>	3756B07592	28.5074	g

Constituent Name	Conc of Primary Soln	FinalConc	Summed Conc	Units
BARIUM	562193.5	16026.67		ppm

Associated Parent IDs

3756B07592

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
NE = Not Entered

Date Printed: Wednesday, January 14, 2009

A Division of Datachem Laboratories

Paragon Analytics Inc.

Standards DB Version: 1.091

Prepare approx 1 l of Ra-228 at a working dilution of approx 50 dpm/ml, in 0.1 M HCl (Fisher Lot 060506)

1) Determine density of 0.1 M HCl

Mass of 100 ml "class A" flask = 62.4713 g Bal 12
flask + 0.1 M HCl = 162.3059 g
Net mass of 100 ml 0.1 M HCl = 99.8346 g
 $\div 100 \text{ ml}$ density = 0.9983 g/ml

2) Transfer approx 2 ml 784.3020.37 to 1 l Nalgene bottle.

Mass of bottle w/o lid = 75.0497 g Bal 12
bottle + std = 77.5697 g
Net mass of std = 2.5200 g

3) Dilute w/ 0.1 M HCl

Mass of bottle w/o lid (from above) 75.0497 g
bottle + diluted std = 1073.4 g (Bal 26)
998.4 g

4) Final Activity Calc.

$$\frac{(33,589.8 \text{ dpm/g}) (2.5200 \text{ g}) (0.9983 \text{ g/ml})}{(998.4 \text{ g})} = 84.6378 \text{ dpm/ml}$$

Std ID: 784.3020.38

RG 8/24/06

RG 8/24/06

Description: Ra-228

Expiration: 6/27/07

Activity: 84.64 dpm/mL

2s Uncertainty: 2.82 dpm/mL

Ref. Date: 1/28/05

Ref Time: N/A

Prep Date: 5/30/06 Prep by: DCB

Matrix/Comp. 0.1M HNO₃

Half Life (y): 5.75E+00

RG 8/24/06

Reverification Log

Analysis Date	Initials	Expiration Date
5/28/08	MBC	5/28/09

ANALYTICS

1380 Seaboard Ind Blvd • Atlanta, GA 30318 • USA • 404-352-8677

Ra-228

SRS 70035-307 Qty 6.24E-1 μ CI QA 10/10

Date 01/28/05 12:00 EST Exp. XXXXXX

PO # 71239, Item 2

5.00994 grams 0.1M HCl solution

CAUTION RADIOACTIVE MATERIAL



Continued on Page

Read and Understood By

Signed

Date 8/24/06

Signed

Date

Date 8/24/06

43 of 217

Prepare a primary dilution of (Analytical SRS 70035-30.7)
 RSO # 784 by diluting contents to approx 40g
 w/ 0.1 M HCl in a 40 ml VOA vial.

1) Prepare 2L 0.1 M HCl by diluting 83 ml conc. HCl, Fischer
 lot # 060506, in 2L DI water.

2) Transfer contents of ampoule to 40 ml VOA vial.
 mass of VOA vial w/ lid = 24.9925g (Bal 12)
 vial + STD 784 = 29.7652g
 net std transferal = 4.7727g


3) Dilute w/ 0.1 M HCl
 mass of vial (from above) = 24.9925g
 vial + std + 0.1 M HCl = 64.2671g (Bal 12)
 net mass of std = 39.2746g

4) Final Activity Calc.

$$\frac{(2.308 \times 10^4 \text{ dpm}) (60 \frac{\text{dpm}}{\text{g}}) (4.7727 \text{ g})}{(5.00994 \text{ g}) (39.2746 \text{ g})} = 33,589.8 \frac{\text{dpm}}{\text{g}}$$

Continued on Page _____

Read and Understood By



Signed

5/30/06

Date



Signed

8/24/06

Date

ANALYTICS



RSO # 784
Rec'd 2/2/05
JCS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 - U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

70035-307

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked with a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	2.308 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	January 28, 2005 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities: γ -impurities (other than decay products) <0.1%

5.00994 grams 0.1M HCl solution with 25 μ g/g Ba carrier.

P O NUMBER 71239, Item 2

SOURCE PREPARED BY: M. Dimitrova
M. Dimitrova, Radiochemist

Q A APPROVED:

Wm R. St. J. 2-1-05



Section 9

ADDITIONAL SUPPORTING DOCUMENTATION



Gas Proportional Counter

Instrument Calibration

Background Calibration

**LB4100-A Weekly Instrument Calibration and Check
Background Determinations**

Detector ID		Alpha			Beta			Detector ID	
	CPM	LCL	UCL	Flag	CPM	LCL	UCL	Flag	
A1 (01)	0.046	0.0212	0.1232	PASS	1.991	1.663	2.366	PASS	A1 (01)
A2 (02)	0.055	0.0190	0.1142	PASS	1.859	1.760	2.037	PASS	A2 (02)
A3 (03)	0.070	0.0385	0.1017	PASS	2.061	1.918	2.204	PASS	A3 (03)
A4 (04)	0.088	0.0078	0.1008	PASS	2.038	1.846	2.152	PASS	A4 (04)
B1 (05)	#REF!	-0.1229	0.3597	#REF!	#REF!	-54.809	122.121	#REF!	B1 (05)
B2 (06)	#REF!	0.0162	0.0891	#REF!	#REF!	-10.460	23.690	#REF!	B2 (06)
B3 (07)	#REF!	0.0383	0.1245	#REF!	#REF!	1.794	2.441	#REF!	B3 (07)
B4 (08)	#REF!	0.0299	0.1241	#REF!	#REF!	1.583	1.955	#REF!	B4 (08)
C1 (09)	0.048	0.0310	0.0994	PASS	1.789	1.569	1.924	PASS	C1 (09)
C2 (10)	0.047	0.0238	0.1042	PASS	1.677	1.535	1.865	PASS	C2 (10)
C3 (11)	0.054	0.0146	0.1142	PASS	1.812	1.670	1.959	PASS	C3 (11)
C4 (12)	0.050	0.0273	0.1059	PASS	1.788	1.671	1.967	PASS	C4 (12)
D1 (13)	#REF!	0.0247	0.1531	#REF!	#REF!	1.642	2.001	#REF!	D1 (13)
D2 (14)	#REF!	0.0089	0.1451	#REF!	#REF!	1.555	1.799	#REF!	D2 (14)
D3 (15)	#REF!	0.0187	0.1013	#REF!	#REF!	1.265	1.632	#REF!	D3 (15)
D4 (16)	#REF!	0.0288	0.1156	#REF!	#REF!	1.392	1.945	#REF!	D4 (16)

Reviewed by: _____

JP

Date: 1/29/09

Control Limits set 11/22/08
JCP 11/22/08

LB4100-B Weekly Instrument Calibration and Check
Background Determinations

Detector ID	Alpha			Flag	Beta			Flag	Detector ID
	CPM	LCL	UCL		CPM	LCL	UCL		
A1 (01)	0.058	0.023	0.110	PASS	1.544	1.239	1.780	PASS	A1 (01)
A2 (02)	0.109	0.042	0.153	PASS	1.481	1.220	1.746	PASS	A2 (02)
A3 (03)	0.063	0.019	0.134	PASS	1.433	1.322	1.728	PASS	A3 (03)
A4 (04)	0.058	0.047	0.087	PASS	1.557	1.402	1.758	PASS	A4 (04)
B1 (05)	0.077	0.041	0.105	PASS	1.743	1.567	1.983	PASS	B1 (05)
B2 (06)	0.111	0.025	0.140	PASS	1.551	1.285	1.823	PASS	B2 (06)
B3 (07)	0.093	0.040	0.136	PASS	1.532	1.358	1.834	PASS	B3 (07)
B4 (08)	0.115	0.042	0.144	PASS	1.653	1.331	1.930	PASS	B4 (08)
C1 (09)	0.060	0.026	0.115	PASS	1.576	1.363	1.934	PASS	C1 (09)
C2 (10)	0.107	0.006	0.171	PASS	1.555	1.348	1.817	PASS	C2 (10)
C3 (11)	0.087	0.005	0.150	PASS	1.928	1.042	4.699	PASS	C3 (11)
C4 (12)	0.073	0.003	0.186	PASS	1.520	1.306	1.887	PASS	C4 (12)
D1 (13)	0.077	0.020	0.163	PASS	1.540	1.483	1.792	PASS	D1 (13)
D2 (14)	0.096	0.014	0.162	PASS	1.663	1.329	2.053	PASS	D2 (14)
D3 (15)	0.050	0.024	0.092	PASS	1.573	1.356	1.987	PASS	D3 (15)
D4 (16)	0.063	0.019	0.147	PASS	3.187	-0.282	7.211	PASS	D4 (16)

Reviewed by: JP Date: 1/27/09

Control Limits established 01/20/09
JCP 01/20/09



Gas Proportional Counter

Quality Control Data

Daily Instrument Performance Checks

LB4100-A Daily Instrument Performance Check
Efficiency Determinations

Detector ID	Alpha				Beta				Detector ID
	Eff.	LCL	UCL	Flag	Eff.	LCL	UCL	Flag	
A1 (01)	0.2523	0.2284	0.2536	PASS	0.3921	0.3689	0.4117	PASS	A1 (01)
A2 (02)	0.2391	0.2273	0.2487	PASS	0.3765	0.3711	0.4042	PASS	A2 (02)
A3 (03)	0.2571	0.2360	0.2650	PASS	0.3960	0.3739	0.4104	PASS	A3 (03)
A4 (04)	0.2323	0.2202	0.2440	PASS	0.3574	0.3377	0.3787	PASS	A4 (04)
B1 (05)	#VALUE!	0.2246	0.2470	#VALUE!	#VALUE!	0.3621	0.4456	#VALUE!	B1 (05)
B2 (06)	#VALUE!	0.2191	0.2451	#VALUE!	#VALUE!	0.3476	0.3828	#VALUE!	B2 (06)
B3 (07)	#VALUE!	0.2015	0.2486	#VALUE!	#VALUE!	0.3583	0.4011	#VALUE!	B3 (07)
B4 (08)	#VALUE!	0.2074	0.2671	#VALUE!	#VALUE!	0.3543	0.4114	#VALUE!	B4 (08)
C1 (09)	0.2374	0.2196	0.2492	PASS	0.3940	0.3593	0.4029	PASS	C1 (09)
C2 (10)	0.2423	0.2364	0.2633	PASS	0.4070	0.3985	0.4258	PASS	C2 (10)
C3 (11)	0.2465	0.2337	0.2623	PASS	0.4176	0.3940	0.4277	PASS	C3 (11)
C4 (12)	0.2384	0.2354	0.2537	PASS	0.4051	0.3969	0.4261	PASS	C4 (12)
D1 (13)	#VALUE!	0.2492	0.2571	#VALUE!	#VALUE!	0.3970	0.4253	#VALUE!	D1 (13)
D2 (14)	#VALUE!	0.2371	0.2511	#VALUE!	#VALUE!	0.4077	0.4300	#VALUE!	D2 (14)
D3 (15)	#VALUE!	0.1748	0.2406	#VALUE!	#VALUE!	0.3079	0.3945	#VALUE!	D3 (15)
D4 (16)	#VALUE!	0.2040	0.2649	#VALUE!	#VALUE!	0.3606	0.4318	#VALUE!	D4 (16)

Reviewed by: _____

JP

Date: _____

1/29/09

Drawer A Control Limits Established 12/13/07 by LJO
Drawer C Control Limits Established 10/29/08 by JCP

ALS Laboratory Group - Fort Collins

QUALITY ASSURANCE SUMMARY SHEET

PAR W.O. # / BATCH GAS FLOW PROPORTIONAL
 TEST GFPC / ALL COUNTER
 METHOD GFPC
 SOP/REV (PREP) -
 SOP/REV (ANAL) 724

Briefly document any QA or other problems or deviations associated with the analysis of samples. Problems could result from: log-in, color, odor, dilution, consistency, scheduling, equipment, or instrumentation, or may include documentation of minor deviations necessary due to unique DQO's or sample characteristics.

Daily Background Checks are not necessary, and therefore not performed, the day following the Weekly Background Calibration. The results of the Weekly Background Calibration will be used as that day's Daily Background Check. If the Weekly Background Calibration is outside the established control limits for a detector, the Weekly Background Calibration will be performed a second time and will be considered as the second Daily Background Check for that day.

[Handwritten signature across the form]

MC
08/05/09

TECHNICIAN/ANALYST

DATE 08-05-09

DEPARTMENT MANAGER

DATE 08/05/09

376920

FORM 302r6.doc (4/22/04)

LB4100-A Daily Instrument Performance Check
Efficiency Determinations

Detector ID	Alpha				Beta				Detector ID
	Eff.	LCL	UCL	Flag	Eff.	LCL	UCL	Flag	
A1 (01)	0.2484	0.2284	0.2536	PASS	0.3915	0.3689	0.4117	PASS	A1 (01)
A2 (02)	0.2356	0.2273	0.2487	PASS	0.3884	0.3711	0.4042	PASS	A2 (02)
A3 (03)	0.2509	0.2360	0.2650	PASS	0.3884	0.3739	0.4104	PASS	A3 (03)
A4 (04)	0.2393	0.2202	0.2440	PASS	0.3612	0.3377	0.3787	PASS	A4 (04)
B1 (05)	#VALUE!	0.2246	0.2470	#VALUE!	#VALUE!	0.3621	0.4456	#VALUE!	B1 (05)
B2 (06)	#VALUE!	0.2191	0.2451	#VALUE!	#VALUE!	0.3476	0.3828	#VALUE!	B2 (06)
B3 (07)	#VALUE!	0.2015	0.2486	#VALUE!	#VALUE!	0.3583	0.4011	#VALUE!	B3 (07)
B4 (08)	#VALUE!	0.2074	0.2671	#VALUE!	#VALUE!	0.3543	0.4114	#VALUE!	B4 (08)
C1 (09)	0.2383	0.2196	0.2492	PASS	0.3851	0.3593	0.4029	PASS	C1 (09)
C2 (10)	0.2383	0.2364	0.2633	PASS	0.4020	0.3985	0.4258	PASS	C2 (10)
C3 (11)	0.2541	0.2337	0.2623	PASS	0.4165	0.3940	0.4277	PASS	C3 (11)
C4 (12)	0.2420	0.2354	0.2537	PASS	0.4042	0.3969	0.4261	PASS	C4 (12)
D1 (13)	#VALUE!	0.2492	0.2571	#VALUE!	#VALUE!	0.3970	0.4253	#VALUE!	D1 (13)
D2 (14)	#VALUE!	0.2371	0.2511	#VALUE!	#VALUE!	0.4077	0.4300	#VALUE!	D2 (14)
D3 (15)	#VALUE!	0.1748	0.2406	#VALUE!	#VALUE!	0.3079	0.3945	#VALUE!	D3 (15)
D4 (16)	#VALUE!	0.2040	0.2649	#VALUE!	#VALUE!	0.3606	0.4318	#VALUE!	D4 (16)

JP

Reviewed by:

Date:

1/30/09

Drawer A Control Limits Established 12/13/07 by LJO
Drawer C Control Limits Established 10/29/08 by JCP

**LB4100-A Daily Instrument Performance Checks
Background Checks**

Detector ID	Alpha			Beta			Flag	Detector ID
	CPM	LCL	UCL	CPM	LCL	UCL		
A1 (01)	0.133	-0.037	0.129	1.550	1.445	2.537	PASS	A1 (01)
A2 (02)	0.117	-0.036	0.146	1.700	1.331	2.387	PASS	A2 (02)
A3 (03)	0.150	-0.032	0.172	2.033	1.505	2.617	PASS	A3 (03)
A4 (04)	0.083	-0.027	0.203	1.850	1.485	2.591	PASS	A4 (04)
B1 (05)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B1 (05)
B2 (06)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B2 (06)
B3 (07)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B3 (07)
B4 (08)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B4 (08)
C1 (09)	0.050	-0.037	0.133	1.883	1.271	2.307	PASS	C1 (09)
C2 (10)	0.033	-0.037	0.131	1.700	1.175	2.179	PASS	C2 (10)
C3 (11)	0.100	-0.036	0.144	1.867	1.291	2.333	PASS	C3 (11)
C4 (12)	0.117	-0.037	0.137	1.633	1.270	2.306	PASS	C4 (12)
D1 (13)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D1 (13)
D2 (14)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D2 (14)
D3 (15)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D3 (15)
D4 (16)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D4 (16)

*Recant in file BKA0130R

Reviewed by: JP Date: 1/30/09

Control limits established from previous weekly background determinations.
Weekly Background File: BKA0128W Date: 1/28/09 Analyst: JCP
0 1/0/00

**LB4100-A Daily Instrument Performance Checks
Background Checks**

Detector ID	Alpha				Beta				Detector ID
	CPM	LCL	UCL	Flag	CPM	LCL	UCL	Flag	
A1 (01)	0.033	-0.037	0.129	PASS	1.933	1.445	2.537	PASS	A1 (01)
A2 (02)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A2 (02)
A3 (03)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A3 (03)
A4 (04)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	A4 (04)
B1 (05)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B1 (05)
B2 (06)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B2 (06)
B3 (07)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B3 (07)
B4 (08)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	B4 (08)
C1 (09)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C1 (09)
C2 (10)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C2 (10)
C3 (11)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C3 (11)
C4 (12)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	C4 (12)
D1 (13)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D1 (13)
D2 (14)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D2 (14)
D3 (15)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D3 (15)
D4 (16)	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	D4 (16)

Reviewed by: JP Date: 1/30/09

Control limits established from previous weekly background determinations.
Weekly Background File: BKA0128W Date: 1/28/09 Analyst: JCP
0 1/0/00

LB4100 - B
Daily Instrument Performance Check
Efficiency Determinations

Detector ID	Alpha			Beta			Flag	Detector ID
	Eff.	LCL	UCL	Eff.	LCL	UCL		
A1 (01)	0.2392	0.2259	0.2626	0.7910	0.7448	0.8656	PASS	A1 (01)
A2 (02)	0.2460	0.2271	0.2640	0.7855	0.7427	0.8631	PASS	A2 (02)
A3 (03)	0.2360	0.2291	0.2663	0.8319	0.7733	0.8987	PASS	A3 (03)
A4 (04)	0.2369	0.2289	0.2660	0.7635	0.7301	0.8485	PASS	A4 (04)
B1 (05)	0.2632	0.2308	0.2682	0.8299	0.7567	0.8795	PASS	B1 (05)
B2 (06)	0.2341	0.2150	0.2498	0.7878	0.7343	0.8533	PASS	B2 (06)
B3 (07)	0.2472	0.2296	0.2668	0.8204	0.7715	0.8967	PASS	B3 (07)
B4 (08)	0.2407	0.2226	0.2587	0.7892	0.7423	0.8627	PASS	B4 (08)
C1 (09)	0.2542	0.2368	0.2752	0.8020	0.7439	0.8646	PASS	C1 (09)
C2 (10)	0.2432	0.2234	0.2596	0.8139	0.7459	0.8668	PASS	C2 (10)
C3 (11)	0.2557	0.2269	0.2636	0.7812	0.7340	0.8530	PASS	C3 (11)
C4 (12)	0.2253	0.2172	0.2524	0.7700	0.7179	0.8343	PASS	C4 (12)
D1 (13)	0.2417	0.2219	0.2579	0.7945	0.7353	0.8546	PASS	D1 (13)
D2 (14)	0.2532	0.2324	0.2701	0.8210	0.7504	0.8721	PASS	D2 (14)
D3 (15)	0.2553	0.2356	0.2739	0.7972	0.7368	0.8563	PASS	D3 (15)
D4 (16)	0.2551	0.2351	0.2732	0.8129	0.7704	0.8954	PASS	D4 (16)

Reviewed by: JP Date: 1/29/09

Control Limits Established 12/30/08 by JCP

LB4100-B Daily Instrument Performance Checks
Background Checks

Detector ID	Alpha			Beta			Flag	Detector ID
	CPM	LCL	UCL	CPM	LCL	UCL		
A1 (01)	0.100	-0.035	0.151	1.183	1.063	2.025	PASS	A1 (01)
A2 (02)	0.067	-0.019	0.237	1.600	1.010	1.952	PASS	A2 (02)
A3 (03)	0.017	-0.034	0.160	1.650	0.969	1.897	PASS	A3 (03)
A4 (04)	0.033	-0.035	0.151	1.467	1.074	2.040	PASS	A4 (04)
B1 (05)	0.067	-0.030	0.184	1.817	1.232	2.254	PASS	B1 (05)
B2 (06)	0.100	-0.018	0.240	1.800	1.069	2.033	PASS	B2 (06)
B3 (07)	0.117	-0.025	0.211	1.417	1.053	2.011	PASS	B3 (07)
B4 (08)	0.200	-0.016	0.246	1.367	1.155	2.151	PASS	B4 (08)
C1 (09)	0.100	-0.035	0.155	1.467	1.090	2.062	PASS	C1 (09)
C2 (10)	0.033	-0.020	0.234	1.450	1.072	2.038	PASS	C2 (10)
C3 (11)	0.050	-0.027	0.201	1.917	1.390	2.466	PASS	C3 (11)
C4 (12)	0.033	-0.032	0.178	1.700	1.043	1.997	PASS	C4 (12)
D1 (13)	0.083	-0.030	0.184	1.450	1.059	2.021	PASS	D1 (13)
D2 (14)	0.067	-0.024	0.216	1.633	1.164	2.162	PASS	D2 (14)
D3 (15)	0.033	-0.037	0.137	1.767	1.087	2.059	PASS	D3 (15)
D4 (16)	0.067	-0.034	0.160	4.000	2.496	3.878	FLAG-HIGH	D4 (16)

* Detector 16 is offline Beta for today.

Reviewed by: JP

Date: 1/29/09

Control limits established from previous weekly background determinations.
Weekly Background File: BKB0126W Date: 1/26/09 Analyst: JCP

LB4100 - B
Daily Instrument Performance Check
Efficiency Determinations

Detector ID	Alpha				Beta				Detector ID
	Eff.	LCL	UCL	Flag	Eff.	LCL	UCL	Flag	
A1 (01)	0.2445	0.2259	0.2626	PASS	0.7935	0.7448	0.8656	PASS	A1 (01)
A2 (02)	0.2420	0.2271	0.2640	PASS	0.7930	0.7427	0.8631	PASS	A2 (02)
A3 (03)	0.2409	0.2291	0.2663	PASS	0.8357	0.7733	0.8987	PASS	A3 (03)
A4 (04)	0.2407	0.2289	0.2660	PASS	0.7777	0.7301	0.8485	PASS	A4 (04)
B1 (05)	0.2528	0.2308	0.2682	PASS	0.8332	0.7567	0.8795	PASS	B1 (05)
B2 (06)	0.2413	0.2150	0.2498	PASS	0.7915	0.7343	0.8533	PASS	B2 (06)
B3 (07)	0.2433	0.2296	0.2668	PASS	0.8580	0.7715	0.8967	PASS	B3 (07)
B4 (08)	0.2398	0.2226	0.2587	PASS	0.7928	0.7423	0.8627	PASS	B4 (08)
C1 (09)	0.2468	0.2368	0.2752	PASS	0.8059	0.7439	0.8646	PASS	C1 (09)
C2 (10)	0.2440	0.2234	0.2596	PASS	0.8244	0.7459	0.8668	PASS	C2 (10)
C3 (11)	0.2368	0.2269	0.2636	PASS	0.7906	0.7340	0.8530	PASS	C3 (11)
C4 (12)	0.2312	0.2172	0.2524	PASS	0.7722	0.7179	0.8343	PASS	C4 (12)
D1 (13)	0.2429	0.2219	0.2579	PASS	0.7985	0.7353	0.8546	PASS	D1 (13)
D2 (14)	0.2496	0.2324	0.2701	PASS	0.8179	0.7504	0.8721	PASS	D2 (14)
D3 (15)	0.2480	0.2356	0.2739	PASS	0.7839	0.7368	0.8563	PASS	D3 (15)
D4 (16)	0.2485	0.2351	0.2732	PASS	0.8054	0.7704	0.8954	PASS	D4 (16)

JP

Reviewed by:

Date: 1/30/09

Control Limits Established 12/30/08 by JCP

LB4100-B Daily Instrument Performance Checks
Background Checks

Detector ID	Alpha			Beta			Flag	Detector ID
	CPM	LCL	UCL	CPM	LCL	UCL		
A1 (01)	0.117	-0.035	0.151	1.483	1.063	2.025	PASS	A1 (01)
A2 (02)	0.167	-0.019	0.237	1.350	1.010	1.952	PASS	A2 (02)
A3 (03)	0.133	-0.034	0.160	1.517	0.969	1.897	PASS	A3 (03)
A4 (04)	0.083	-0.035	0.151	1.550	1.074	2.040	PASS	A4 (04)
B1 (05)	0.100	-0.030	0.184	1.817	1.232	2.254	PASS	B1 (05)
B2 (06)	0.133	-0.018	0.240	1.583	1.069	2.033	PASS	B2 (06)
B3 (07)	0.133	-0.025	0.211	1.800	1.053	2.011	PASS	B3 (07)
B4 (08)	0.150	-0.016	0.246	1.367	1.155	2.151	PASS	B4 (08)
C1 (09)	0.083	-0.035	0.155	1.300	1.090	2.062	PASS	C1 (09)
C2 (10)	0.133	-0.020	0.234	1.617	1.072	2.038	PASS	C2 (10)
C3 (11)	0.033	-0.027	0.201	1.933	1.390	2.466	PASS	C3 (11)
C4 (12)	0.133	-0.032	0.178	1.817	1.043	1.997	PASS	C4 (12)
D1 (13)	0.100	-0.030	0.184	1.350	1.059	2.021	PASS	D1 (13)
D2 (14)	0.167	-0.024	0.216	1.617	1.164	2.162	PASS	D2 (14)
D3 (15)	0.050	-0.037	0.137	1.717	1.087	2.059	PASS	D3 (15)
D4 (16)	0.033	-0.034	0.160	4.533	2.496	3.878	FLAG-HIGH	D4 (16)

* Detector 16 is offline Beta for 72 day.

Reviewed by: JP Date: 1/30/09

Control limits established from previous weekly background determinations.
Weekly Background File: BKB0126W Date: 1/26/09 Analyst: JCP



Gas Proportional Counter

Instrument Calibration

**Initial Efficiency Calibration
Standards Traceability**

Instrument: LB4100-A

Calibration: Sr-89 Flat Planchet

Date of Calibration: 10/06/08
10/14/08

Efficiency Log Files: Sr89-10/08

Efficiency Files: ESE1006, ESE1006A
ESE1014

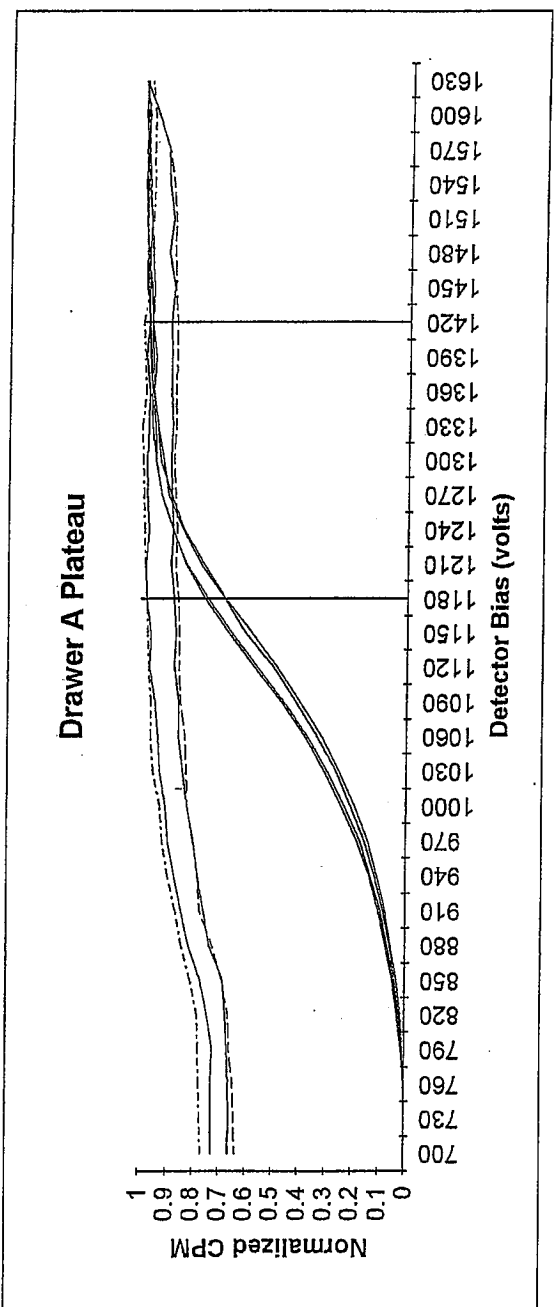
Source ID's: Sr-89- 865.3610.08 (Efficiency)
Sr-89- 784.3020.38 (ICV's & ICB's)

RG
10/24/08

Instrument Plateaus

Unit Type: LB4100/W-A
 Date Performed: 9/18/07 09:58
 FileName: PTA0918A
 Batch ID: PLATEAU

Unit Id: Orange
 Application Revision: B
 Application Version: Standard



Optimum alpha beta simultaneous operating voltage: **1420**

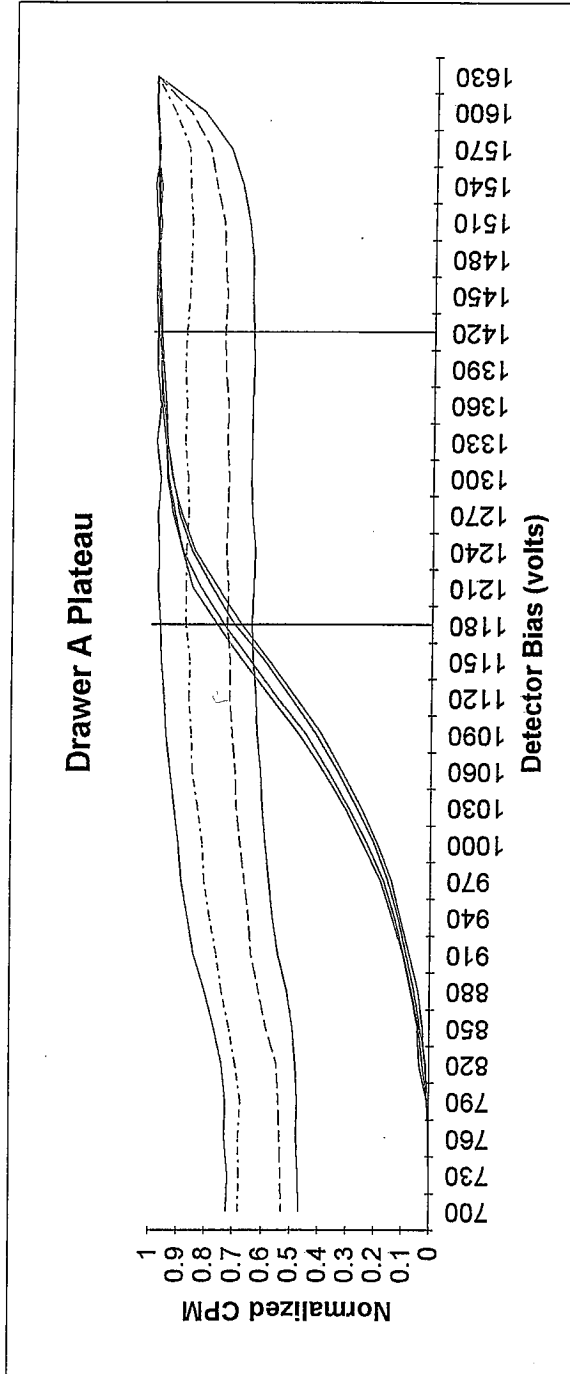
Optimum alpha only operating voltage: **1180**

	A1	A2	A3	A4
Beta slope at beta voltage	1.99%	1.77%	2.19%	0.99%
Alpha slope at beta voltage	0.06%	0.88%	0.76%	-0.99%
Alpha slope at alpha voltage	0.96%	1.53%	1.44%	1.63%

Archived
R6
10/24/08

Unit Type: LB4100/W-A
 Date Performed: 9/9/08 09:15
 FileName: PTA0909A
 Batch ID: PLATEAU

Unit Id: Orange
 Application Revision: B
 Application Version: Standard



Optimum alpha beta simultaneous operating voltage: **1417.5**

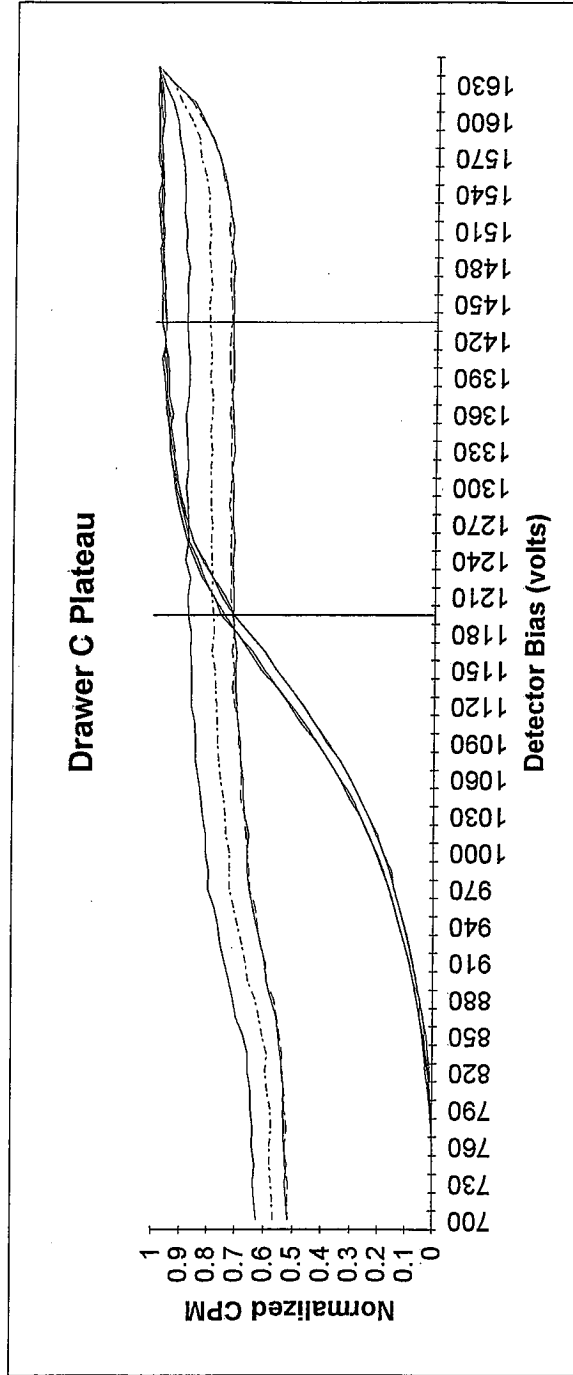
Optimum alpha only operating voltage: **1177.5**

	A1	A2	A3	A4
Beta slope at beta voltage	1.21%	1.85%	2.20%	2.88%
Alpha slope at beta voltage	1.37%	1.15%	0.41%	-1.37%
Alpha slope at alpha voltage	1.97%	1.67%	0.84%	1.50%

Plateau Check run 9/9/08.
 All parameters in control.
 Voltage and ROI's will
 remain the same from
 09/07 Calibration.

Unit Type: LB4100/W-A
Date Performed: 7/31/08 10:42
FileName: PTA0731C
Batch ID: PLATEAU

Unit Id: Orange
Application Revision: B
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: **1435**

Optimum alpha only operating voltage: **1195**

	C1	C2	C3	C4
Beta slope at beta voltage	1.87%	0.33%	1.16%	1.31%
Alpha slope at beta voltage	0.84%	-0.50%	1.55%	0.58%
Alpha slope at alpha voltage	2.46%	2.31%	1.43%	0.91%

9/18/07 LSD	<u>Plateaus For Drawers A and B</u>		
	<u>Source Used B</u>	<u>Detector</u>	<u>Source used</u>
	Sr/Y 90 - 406	A1 B1	410 - Am 241
	29,600 dpm - 407	A2 B2	411 - 17,800 dpm
	9/15/92 - 408	A3 B3	412 - 2/06/95
	↓ - 409	A4 B4	413 - ↓
	<u>Parameters</u>	<u>File names:</u>	
	Starting Voltage - 700	PTA0918A	
	Ending Voltage - 1650	PTA0918B	
	30 Volts / step		
	5 min / step		
	40,000 count preset		
9/18/07 LSD	A working voltage could not be found for Drawer B. Another plateau will be run using the same sources as above but different parameters.		
	<u>Parameters</u>	<u>File name:</u>	
	Starting Voltage: 700	PTA0919B	
	Ending Voltage: 1650		
	15 Volts / step		
	5 min / step		
	60,000 count preset		
9/20/07 LSD	A working voltage could still not be found. Technical consultant Mr. Burns Dave Burns suggested setting all the ROIs at 50% before running a plateau.		
	<u>Parameters</u>	<u>Filename:</u>	
	Starting Voltage: 700	PTA0920B	
	Ending Voltage: 1650		
	30 Volts / step		
	5 min / step		
9/20/07 LSD	50,000 ct. preset		
Continued on Page			

Continued on Page

Read and Understood By

Laura Urban
Signed

9/20/07
Date

Renee Hall
Signed

10/24/08
Date

4/11/08
JH All pucks were cleaned with radiac wash and rinsed with D.I. water

5/27/08
JH Power Outage 5/27/08
5/27/08

7/24/08 Controller for Drawers C+D received from Canberra and put back into instrument. Gas line/flow for Drawer D does not appear to be working. Controller will be powered back down and The situation will be investigated
JP 7/25/08

7/25/08 All pucks were cleaned with radiac wash and rinsed with DI water.
JP 7/25/08

7/31/08 Plateaus for Drawers C and D

Source Used B

Sr/M/90 - 406

29,600 DPM - 407

9/15/92 - 408

↓ - 409

Detectors

C1 D1

C2 D2

C3 D3

C4 D4

Source Used A

410 - Am241

411 - 17,800 dpm

412 - 2/06/95

413 - ↓

Parameters:

Starting Voltage: 700

Ending Voltage: 11650

15 Volts/step

5 Min/step

50000 count preset

File names:

PTA0731C - Drawer C

PTA0731B - Drawer D

RG 10/8/08

Continued on Page

Read and Understood By

Signed

8/5/08

Date

Signed

10/8/08

67 of 217

8/5/06 Plateaus For Drawer DBeta Sources Used

#406 Sr/Y-90
#407 29,600 DPM
#408 9/15/92
#409 ↓

Detectors

D1
D2
D3
D4

Alpha Sources Used

#410 Am241
#411 17,800 DPM
#412 2/06/95
#413 ↓

Parameters:

Starting Voltage: 700
Ending Voltage: 1650
15 Volts/Step
5 Min/Step
50,000 Count Preset

Filename

PTD0805

8/8/08 ROI's Set for Drawer C using Sr/Y-90 Plateau Sources9/9/08 Plateaus For Drawer ABeta Sources Used

#406 Sr/Y-90
#407 26,900 dpm
#408 9/15/92
#409 ↓

Detectors

A1
A2
A3
A4

Alpha Sources Used

#410 Am241
#411 17,800 dpm
#412 2/06/95
#413 ↓

Parameters

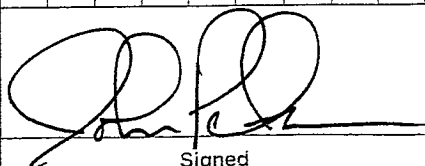
Starting Voltage: 700
Ending Voltage: 1650
30 Volts/Step
5 min/Step
40,000 Count Preset

Filename

PTA0909A

Continued on Page

Read and Understood By


Signed10/2/08
Date
Signed10/8/08
Date

Date 9/18/07SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	✓								
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	NA			
Dr B	↓			
Dr C	OL			
Dr D	↓			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	700	Dr A	0.15
	↓	Dr B	↓
Tank 2	1400	Dr C	↓
	↓	Dr D	↓

Comments:

* Drawers C & D are offline.
 Drawers A & B do not have
 a working calibration.
 LO 9/18/07

Page No.: **326262** A

Form 780r8.doc (6/23/06)

Reviewed By / Date 9/19/07

Date 9/18/07

SOP 724r/6

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-4	Plateaus	-	-	5 step	954	LD	PTA0918A	LD
5-8	↓	-	-	↓	↓	↓	PTA0918B	↓
A diagonal line is drawn from the bottom-left corner to the top-right corner of the grid area.								

Comments:

Page No.: **326262** B
(cont. from page NA B)

Form 780r8.doc (6/23/06)

Reviewed By / Date W. A. / 9/12

Date 7/31/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	W	P			W	P			P
2	↓	↓			↓	↓			↓
3	↓	↓			↓	↓			↓
4	↓	↓			↓	↓			↓
5	OL								
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA0725W			
Dr B	OL			
Dr C	↓			
Dr D	↓			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	2000	Dr A	0.15
	↓	Dr B	↓
Tank 2	1050	Dr C	↓
	↓	Dr D	↓

Comments:

Date 7/31/08

SOP 724r10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-4	Daily EFF	-	-	30	850	W	EFA0731	W
1-4	Daily BKG	-	-	60	905	W	BKA0731	W
1	08071418-1	AB080721-3	AB	240	1017	W	ABA0731	W
2	↓ -1D	↓	↓	↓	↓	↓	↓	↓
3	↓ -1MS	↓	↓	60	1018	↓	ABA0731A	W
4	AB080721-3 CCS	↓	↓	↓	↓	↓	↓	↓
9-12	Alpha/Beta	Plateau	5/step	-	1037	W	PTA0731C	W
13-16	↓	↓	↓	-	↓	↓	PTA0731D	↓
1	0807052-1	SR080724-2	Sr 89	800	18:50	JH	SR 0731	↓
2	↓ -1D	↓	↓	↓	↓	↓	SRA	↓
3	SR080724-2 MB	↓	↓	↓	↓	↓	↓	↓
4	↓ CCS	↓	↓	↓	↓	↓	↓	↓
<div>JP 8/14/08</div> <div>7/31/08</div>								

Comments:

Date 9/9/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	↓			↓	↓			↓
3									
4									
5	OL								
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA0905W			
Dr B	OL			
Dr C	↓			
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1700	Dr A	0.15
	↓	Dr B	↓
Tank 2	900	Dr C	↓
	↓	Dr D	↓

Comments:

Date 9/9/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-4	Daily Eff	---	---	30	7:30	JP	EFA0909	JP
1-4	Daily Bkg	---	---	60	7:44	JP	BKA0909	JP
1-4	Alpha/Beta	Plateau	Plateau	5 Step	9:10	JP	PTA0909A	JP
3	0808139-1	TR080825-1	Ra226	30	17:42	JP	RDA0909	JP
4	-2	↓	↓	↓	↓	↓	↓	↓
<div>JP 9/10/08</div>								

Comments:

Page No.: 367361 B
N/A B)

Form 780r8.doc (6/23/06)

Reviewed By/Date JP 9/10/08
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Instrument ROIs

LB4100-A/W Sample Counting Parameters for LIMS

	Date/Time	Official	Blas	Step
A	9/18/07 9:58	TRUE	1420	0
B	9/24/07 12:21	TRUE	1500	0
C	7/31/08 10:42	TRUE	1435	0
D	8/5/08 11:19	TRUE	1500	0

Detector Specific:

	Date/Time	Official	Threshold	bLL	bUL	aLL	aUL
A1	9/26/07 0:00	TRUE	0.1	Q	29.79	57.53	100
A2	9/26/07 0:00	TRUE	0.1	0	33.08	62.27	100
A3	9/26/07 0:00	TRUE	0.1	0	25.42	49.42	100
A4	9/26/07 0:00	TRUE	0.1	0	27.3	52.3	100
B1	9/26/07 0:00	TRUE	0.1	0	48.74	90.2	100
B2	9/26/07 0:00	TRUE	0.1	0	17.26	39.75	100
B3	9/26/07 0:00	TRUE	0.1	0	17.53	37.8	100
B4	9/26/07 0:00	TRUE	0.1	0	15.75	35.31	100
C1	8/8/08 0:00	TRUE	0.1	0	29.01	56.19	100
C2	8/8/08 0:00	TRUE	0.1	0	30.94	58.19	100
C3	8/8/08 0:00	TRUE	0.1	0	35.84	69.27	100
C4	8/8/08 0:00	TRUE	0.1	0	33.67	64.05	100
D1	8/26/08 0:00	TRUE	0.1	0	58.82	59.48	100
D2	8/26/08 0:00	TRUE	0.1	0	55.92	55.92	100
D3	8/26/08 0:00	TRUE	0.1	0	8.76	8.74	100
D4	8/26/08 0:00	TRUE	0.1	0	12.89	12.89	100

Oxford Systems Unit Manager

File Security Window Help

Orange LB4100 A1 - Orange LB4100 A2 - Orange LB4100 A3 - Orange LB4100 A4 -

ID: A1-01 Alpha CPM Beta CPM Time Left

ID: A2-01

ID: A3-01

ID: A4-01

Stat ROI's

Detector A2

Alpha Upper Limit 100.00 %

Alpha Lower Limit 62.27 %

Beta Upper Limit 33.08 %

Beta Lower Limit 0.00 %

Alpha Counts 35

Beta Counts 1898

Beta to Alpha Crosstalk 1.81 %

Count Close Help

Orange LB4100 A1 - Orange LB4100 A2 - Orange LB4100 A3 - Orange LB4100 A4 -

ID: A1-01 Alpha CPM Beta CPM Time Left

ID: A2-01

ID: A3-01

ID: A4-01

Alpha CPM 0.05

Beta CPM 2.00

Time Left 0

Orange LB4100 B4 -

ID: B1-01 Alpha CPM Beta CPM Time Left

Alpha CPM 0.05

Beta CPM 1.69

Time Left 0

Lock Key

[illegible]

Oxford Systems Unit Manager

File Security Window Help

Orange LB4100 A1 - Orange LB4100 A2 - Orange LB4100 A3 - Orange LB4100 A4 -

ID: A1-01 Alpha CPM Beta CPM Time Left

ID: A2-01

ID: A3-01

ID: A4-01

Set ROI's

Detector A4

Alpha Upper Limit 100.00 %

Alpha Lower Limit 52.30 %

Beta Upper Limit 27.30 %

Beta Lower Limit 0.00 %

Alpha Counts 47

Beta Counts 1995

Beta to Alpha Crosstalk 2.30 %

Count

Close

Help

0.05

2.00

0

0.05

1.69

0

9:34

Clock 9/23

File Security Window Help
Oxford Systems Unit Manager

αβ

Orange LB4100 - Create Batch

LB4100 A1

Application

Air Filter

Alpha Beta

Attenuation

Background

Background

Efficiency

EPA Waters

Gas Proport

Generic

Set ROI's

Detector C1

Alpha Upper Limit	100.00 %	Alpha Counts	103
Alpha Lower Limit	56.19 %	Beta Counts	102136
Beta Upper Limit	29.01 %	Beta to Alpha Crosstalk	0.10 %
Beta Lower Limit	0.00 %		

M: 0.07

M: 1.87

ft: 0

Data File Name

Batch ID

Run

Count

Close

Help

9:34

Clock 8/8

Oxford Systems Unit Manager

File
Security
Window
Help

Orange LB4100 - Create Batch

LB4100 A1

Application

Air Filter
 Alpha Beta
 Attenuation
Background
 Background
 Efficiency
 EPA Waters
 Gas Proport
 Generic

Data File Na

Batch ID

Run

Detector C2

Alpha Upper Limit

100.00 %

+

Alpha Lower Limit

30.94 %

+

Beta Upper Limit

30.94 %

+

Beta Lower Limit

0.00 %

+

Set ROI's

Alpha Counts

2483

Beta Counts

96866

Beta to Alpha Crosstalk

2.50 %

Count

Close

Help

M:

M:

ft:

0.07

1.87

0

9.37

Back 8/8

Page 1

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9/24/07
 100 A working voltage could still not be found. It was assumed that the count preset was what governed how many counts were being recorded. Turns out that the plateau file was only gathering the counts for 5 minutes and not trying to hit the count preset. This was remedied by increasing the minutes per step to 15 minutes instead of 5 minutes. Two separate plateaus were run (Separates alpha & beta ones) on 9/21/07 and 9/22/07.

Parameters

Starting Voltage: 300
 Ending Voltage: 1800
 15 Volts per step
 15 min per step
 50000 Count preset

File names:

PTA0921 \Rightarrow alpha
 PLAT0922 \Rightarrow beta

PTA0924B \Rightarrow both Archived
 ← over 1000 min

9/26/07
 100 ROIs set for drawer A and drawer B using the Sr/Y 90 Plateau sources.

9/27/07 100 Daily Efficiency

New "daily efficiency" Interim control limits using the efficiency run after new ROIs were set. (EFA0926) Historical control limits will be set after 30 data points have been accumulated.

Weekly & Daily Backgrounds

New "weekly background" Interim control limits using the weekly background run after new ROIs were set. (BKA0921w). Historical control limits will be set after 10 data points have been accumulated.

Continued on Page

Read and Understood By

Lana Naban
 Signed

9/24/07
 Date

Renee Kelley
 Signed

10/24/07
 Date

8/5/08 Plateaus For Drawer DBeta Sources Used

#406 Sr/Y-90
#407 29,600 DPM
#408 9/15/92
#409 ↓

Detectors

D1
D2
D3
D4

Alpha Sources Used

#410 Am241
#411 17,800 DPM
#412 2/06/95
#413 ↓

Parameters:

Starting Voltage: 700
Ending Voltage: 1650
15 Volts/Step
5 Min/Step
50,000 Count Preset

Filename

PTD0805

8/8/08 ROI's Set for Drawer C using Sr/Y-90 Plateau Sources9/9/08 Plateaus For Drawer ABeta Sources Used

#406 Sr/Y-90
#407 26,900 dpm
#408 9/15/92
#409 ↓

Detectors

A1
A2
A3
A4

Alpha Sources Used

#410 Am241
#411 17,800 dpm
#412 2/06/95
#413 ↓

Parameters

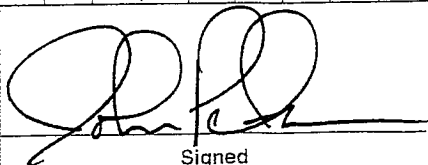
Starting Voltage: 700
Ending Voltage: 1650
30 Volts/Step
5 min/Step
40,000 Count Preset

Filename

PTA0909A

Continued on Page

Read and Understood By



Signed

10/2/08

Date



Signed

10/8/08

Date

90 of 217

Calibration Efficiencies

SOURCES.XLS

Source Database for OSUM for LB4100-A
Number of sources in table: 176

Application Revision: A

Control ID	Isotope	Type	Half-Life (Days)	DPM	Std dev	Date	Status	Alpha/Beta Archive File
1191	Am-241	Alpha	157856.728	9342	467.10	6-Apr-04	PA	Am241Wipe-10/08
1192	Sr-90/Y-90	Beta	10518.912	37044	1852.20	10-Dec-01	PA	Sr90Wipe-10/08
1193	Am-241	Alpha	157783.68	5514.295	275.71	6-Jun-01	PA	Am241-10/08
1194	Sr-90	Beta	10518.912	19986.92	999.35	2-Dec-04	PA	Sr90R-10/08
1195	Sr-90	Beta	10518.912	1110	55.50	18-Mar-99	PA	Sr90F-10/08
1196	Sr-89	Beta	50.53	10512.56	525.63	1-Oct-08	PA	Sr89-10/08
1197	Ra-226	Alpha	584384	3339.84	166.99	7-Oct-08	PA	TRA-10/08
1198	Th-230	Alpha	27539096	2653.3957	132.67	13-Jul-04	PA	Th230-10/08

Sr-89 Efficiency Calibration

LB4100-A

Date: 10/6/2008

Source ID: 1196

Det ID	A1	A2	A3	A4	B1	B2	B3	B4
File Name	ESE1006	ESE1014	ESE1006	ESE1006	N.A.	N.A.	N.A.	N.A.
Cnt Time	2.42	2.74	2.46	2.49	N.A.	N.A.	N.A.	N.A.
Tot Cnts	10021	10015	10002	10006	N.A.	N.A.	N.A.	N.A.
Bkg CPM	2.321	1.941	2.120	2.077	N.A.	N.A.	N.A.	N.A.
CPM	4138.588	3653.168	4063.734	4016.397	N.A.	N.A.	N.A.	N.A.
Alpha Efficiency	0.000288	0.000161	0.000367	0.000571	N.A.	N.A.	N.A.	N.A.
Beta Efficiency	0.424442	0.418504	0.416765	0.411911	N.A.	N.A.	N.A.	N.A.
Efficiency	0.4244	0.4185	0.4168	0.4119	N.A.	N.A.	N.A.	N.A.

Det ID	C1	C2	C3	C4	D1	D2	D3	D4
File Name	ESE1006A	ESE1006A	ESE1006A	ESE1006A	N.A.	N.A.	N.A.	N.A.
Cnt Time	2.35	2.26	2.34	2.38	N.A.	N.A.	N.A.	N.A.
Tot Cnts	10009	10046	10043	10031	N.A.	N.A.	N.A.	N.A.
Bkg CPM	1.847	1.653	1.915	1.866	N.A.	N.A.	N.A.	N.A.
CPM	4257.302	4443.480	4289.965	4212.840	N.A.	N.A.	N.A.	N.A.
Alpha Efficiency	0.000298	0.000131	0.000215	0.000467	N.A.	N.A.	N.A.	N.A.
Beta Efficiency	0.436687	0.455784	0.440038	0.432126	N.A.	N.A.	N.A.	N.A.
Efficiency	0.4367	0.4558	0.4400	0.4321	N.A.	N.A.	N.A.	N.A.

Sr-89 FLAT Planchet

LB4100-A

10/6/2008	Efficiency 2007	Efficiency 2008	% Diff
Det #			
A1	0.4175	0.4244	1.65
A2	0.4080	0.4185	2.57
A3	0.4124	0.4168	1.07
A4	0.4232	0.4119	2.67
C1	0.4139	0.4367	5.51
C2	0.4323	0.4558	5.44
C3	0.4360	0.4400	0.92
C4	0.4456	0.4321	3.03

NOTE: Paragon Analytics SOP724R10 states that efficiency calibrations must be within 5 % of the previous calibration values. Prior to the current calibration, the controller for Drawers C and D had a catastrophic failure and was removed from service. The detectors for Drawer C were recalibrated on 10/01/08 and Detector C1 and C2 showed a new counting efficiency slightly more than 5% of the previous efficiency. All calibration and sample data is believed to be unaffected and will be used without further qualification.

OK
RG 10/24/08

10/1/08 Gross Alpha/Beta ICV's, ICB's (Am 241 & Sr 90) - Ringed Planchet

Sources (ICB)	Detectors	Sources (ICV's)	Filename
0815506-B1	A1 A3	0815506-S1	ABA1001B
B2	A2 C3	S2	
B3	C1 C4	S3	

10/1/08 Sr 90 ICV's, ICB's (Sr 90 on Flat Planchet)

Sources (ICB)	Detectors	Sources	Filename
0714506-B1	A4 A1	0714506-S1	SRA1001
B2	C2 A2	S2	
B3	C3 C1	S3	

10/2/08 Th 230 Calibration (Gross Alpha-DW Protocol) Ringed Planchet

Bench sheet: ABC60619-3 Source ID: 1198 Logfile: Th230-10/08

Source	Detectors	File names
0618014-1LCS	A1 C1	ETH100Z ETH100ZA
ZLCS	A2 C2	
4LCS	A3 C3	
5LCS	A4 C4	

10/6/08 Sr 89/
Ra 228 Calibration (Sr 89 on Flat Planchet)

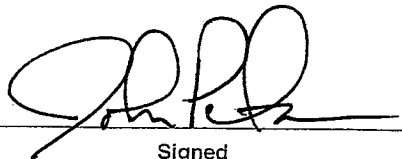
Benchsheet: RA081001-Z Source ID: 1196 Log File: Sr 89-10/08

Sources	Detectors	File names
0822001-1	A1 C1	ESE1006 ESE1006A
-2	A2 C2	
-4	A3 C3	
-5	A4 C4	

BG 10/8/08

Continued on Page

Read and Understood By


Signed

10/07/08
Date


Signed

10/8/08
Date

10/14/08 Sr 90 on Ringed Planchet
Mass Attenuation Curve

Benchsheet: AB070525-1

Sources: 0717509-S1 → S16

Det	10:00	10:10	10:18	10:28	10:41	10:51	11:09	11:17
A1	1	8	7	6	5	4	3	2
A2	2	1	8	7	6	5	4	3
A3	3	2	1	8	7	6	5	4
A4	4	3	2	1	8	7	6	5
C1	5	4	3	2	1	8	7	6
C2	6	5	4	3	2	1	8	7
C3	7	6	5	4	3	2	1	8
C4	8	7	6	5	4	3	2	1

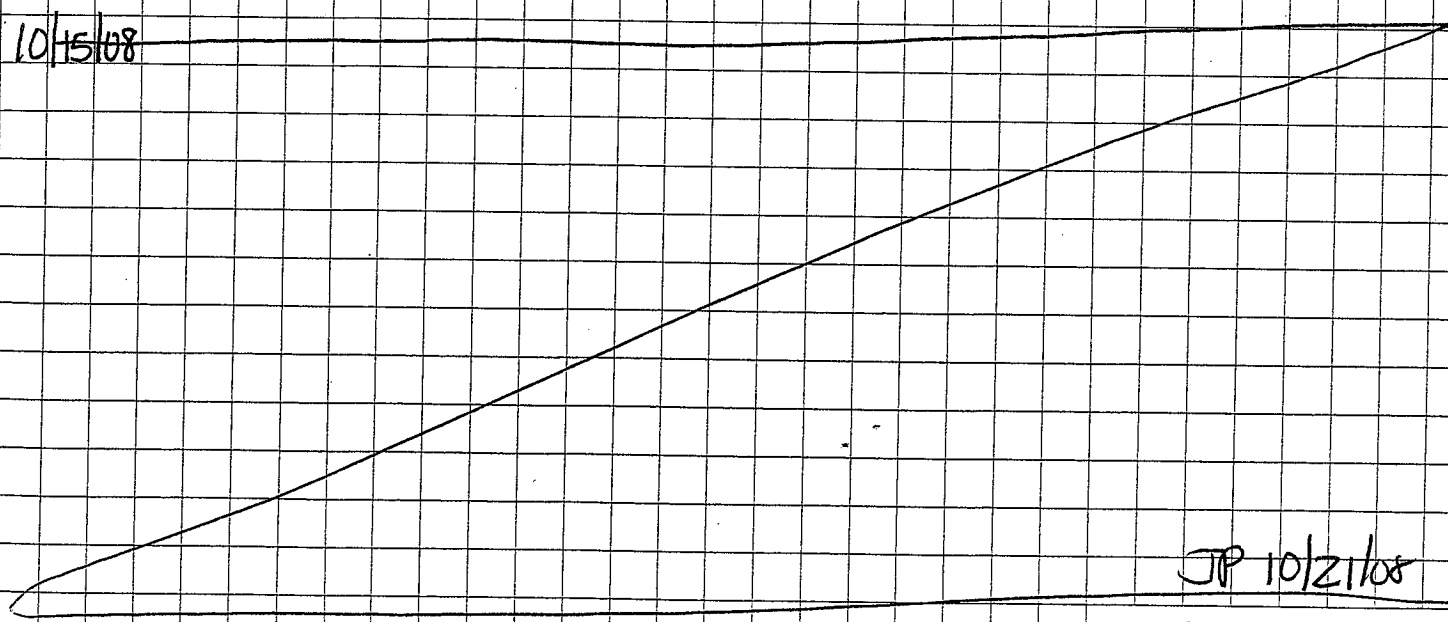
Det	He11	He11	12:01	12:11	12:24	12:39	12:49	12:59
A1	9	16	15	14	13	12	11	10
A2	10	9	16	15	14	13	12	11
A3	11	10	9	16	15	14	13	12
A4	12	11	10	9	16	15	14	13
C1	13	12	11	10	9	16	15	14
C2	14	13	12	11	10	9	16	15
C3	15	14	13	12	11	10	9	16
C4	16	15	14	13	12	11	10	9

Filename: ASR1014

Filename: ASR1014A

10/14/08 Sr 89/Ra228 Calibration on Flat Planchet

Benchsheet: RA081001-Z Source ID: 1196 Logfile: Sr89-10/08
Source: 0822001-Z Detector: A2 Filename: ESE1014



Continued on Page

Signed

10/21/08
Date

Read and Understood By

Signed

10/21/08
Date 96 of 217

Date 10/6/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	↓			↓	↓			↓
3									
4									
5	OL								
6									
7									JP 10/6/08
8									
9	JP	P			JP	P			P
10	↓	↓			↓	↓			↓
11									
12									
13									
14									
15									
16									JP 10/6/08

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA1013W / BKA1004W			
Dr B	OL			
Dr C	BKA1003W			
Dr D	OL			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	2000	Dr A	0.15
	↓	Dr B	↓
Tank 2	850	Dr C	↓
	↓	Dr D	↓

Comments:

Date 10/6/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-4,9-12	Daily EFP	---	---	30	7:55	JP	EFA1006	JP
1-4,9-12	Daily BKs	---	---	60	8:07	JP	BKA1006	JP
1-4	1196	Sr 89 EFP	B	30	10:33	JP	ESF1006	JP
9-12	1196	Sr 89 EFP	B	30	10:50	JP	ESE1006A	JP
							JP 10/7/08	

Comments:

Page No.: 367386 B
(cont. from page NA B)

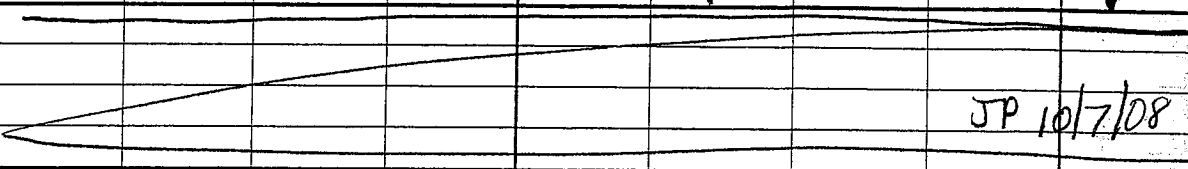
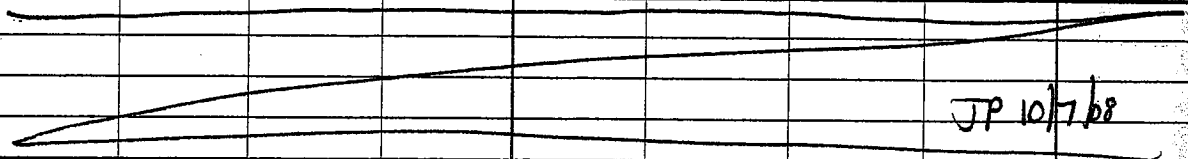
Form 780r8.doc (6/23/06)

Reviewed By/ Date JP 10/7/08 217

Date 10/7/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	↓			↓	↓			↓
3									
4									
5									
6									
7									
8									
9	JP	P			JP	P			
10	↓	↓			↓	↓			
11									
12									
13									
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA1003W/BKA1004W			
Dr B	OL			
Dr C	BKA1003W			
Dr D	OL			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1800	Dr A	0.15
	↓	Dr B	↓
Tank 2	850	Dr C	↓
	↓	Dr D	↓

Comments:

Date 10/14/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	↓			↓	↓			↓
3						H ₂	JP	P	
4	↓	↓			↓	P			↓
5	OL								
6									
7									JP 10/14/08
8									
9	JP	P			JP	P			P
10	↓	↓			↓	H ₂	JP	P	↓
11						H ₂	↓	↓	
12	↓	↓			↓	H ₂ , B	↓	↓	↓
13	OL								
14									
15									JP 10/14/08
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA1010W			
Dr B	OL			
Dr C	BKA1010W			
Dr D	OL			

Dr = Drawer

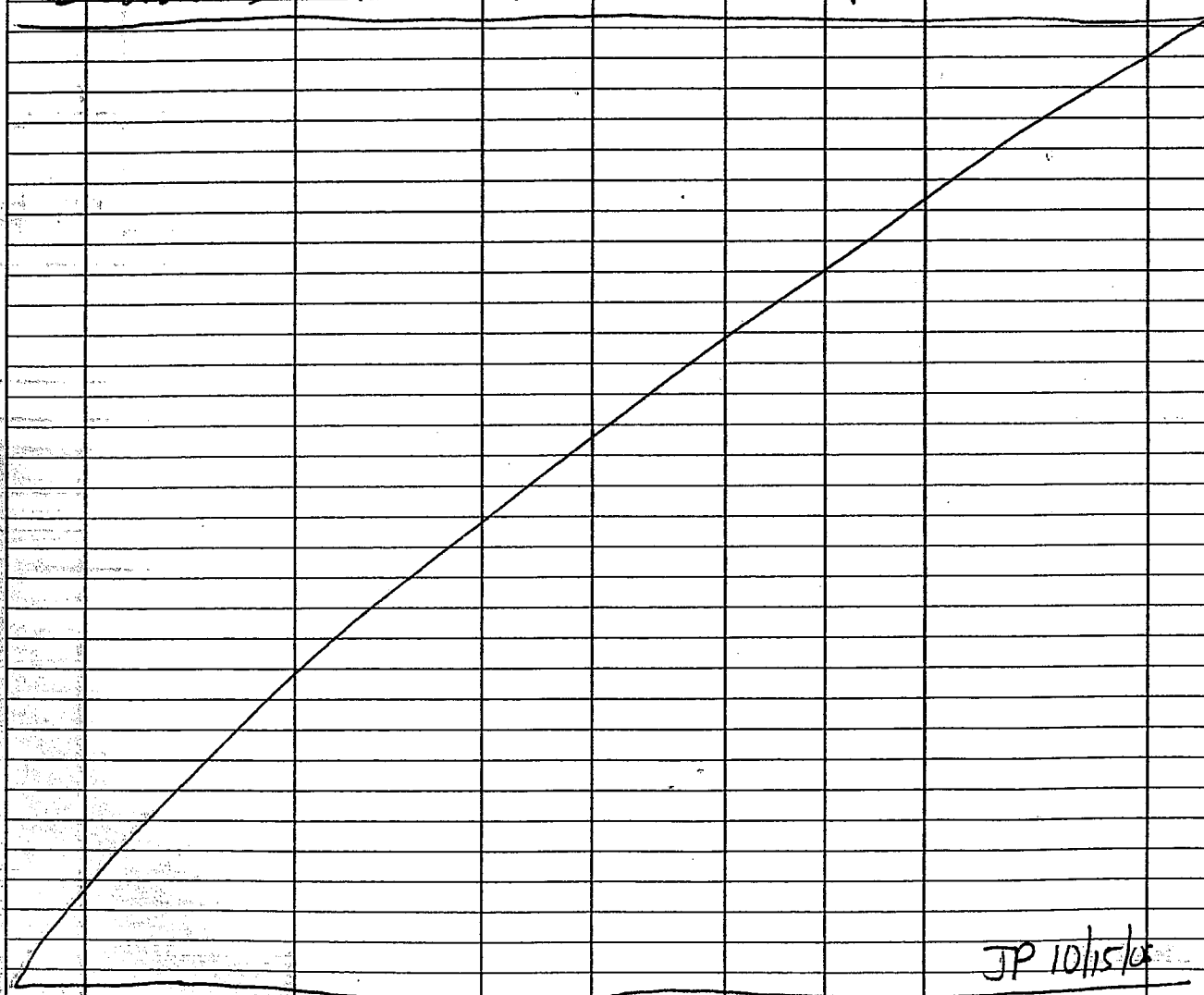
Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	300	Dr A	0.15
	↓	Dr B	↓
Tank 2	850	Dr C	↓
	↓	Dr D	↓

Comments:

Date 10/14/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-49-12	Daily EFF	—	—	30	7:34	JP	EFA1014	JP
1-49-12	Daily Bkg	—	—	60	7:44	JP	BKA1014	JP
3-10-12	Daily Bkg	—	—	60	8:52	JP	BKA1014R	JP
1-49-12	0717509-38	Sr90 Mass Attn	—	120	10:00	JP	ASR1014	JP
1-49-12	0717509-916	↓	—	120	11:34	JP	ASR1014A	JP
2	1196	Sr89 EFF	B	30	13:11	JP	ESE1014	JP
1	0808083-8	SR081001-1	Sr90	1000	13:49	JP	SRA1014	JP
2	—	↓	↓	↓	↓	↓	↓	↓
3	—	↓	↓	↓	↓	↓	↓	↓
4	—	↓	↓	↓	↓	↓	↓	↓
9	—	↓	↓	↓	↓	↓	↓	↓
10	—	↓	↓	↓	↓	↓	↓	↓
11	—	↓	↓	↓	↓	↓	↓	↓
12	0808087-5	↓	↓	↓	↓	↓	↓	↓
								

Comments:

Date 10/15/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	↓			↓	↓			↓
3									
4									
5	OL								
6									
7									
8									
9	JP	P			JP	P			P
10	↓	↓			↓	↓			↓
11									
12									
13	OL								
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA1010W			
Dr B	OL			
Dr C	BKA1010W			
Dr D	OL			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	2000	Dr A	0.15
	↓	Dr B	↓
Tank 2	850	Dr C	↓
	↓	Dr D	↓

Comments:

Radiochemistry Instrument Worksheet

Paragon Analytics

Prep Batch: RA081001-2

Prep Procedure: RA228

Analytical QASS / NCR? Y NA

Prep Num	LabID	QC Type	Init Aliq	Fin Aliq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
----------	-------	---------	-----------	----------	-------	--------------	--------------------	------------	----------------	------------------	------------	----------------	------------------	------------	----------------	------------------	-------

1	0822001-1	SMP	1500	1500	ml	PC/L											
1	0822001-2	SMP	1500	1500	ml	PC/L											
1	0822001-3	SMP	1500	1500	ml	PC/L											
1	0822001-4	SMP	1500	1500	ml	PC/L											
1	0822001-5	SMP	1500	1500	ml	PC/L											

JP 10/21/08

Tracer/Carrier Solution Information										Spike Solution Information							
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Prep Date	Aliquot	Units	Prep Date	Aliquot	Units	Pipet ID	Pipet ID	Pipet ID	Pipet ID
T1	STRONTIUM	247960	2,004.008	pCi/ml	NA	1	ml	RS-006	S1	Sr-89	865.3610.08	2,102.511	DPM/ml	10/01/08	5	ml	RS-015

Reporting Units

Sample Barcodes

0822001-1 RA081001-2PS1		0822001-2 RA081001-2PS2	
0822001-3 RA081001-2PS3		0822001-4 RA081001-2PS4	
0822001-5 RA081001-2PS5			

*Outlier

Radiochemistry Prep Worksheet

Paragon Analytics

Prep Batch: RA081001-2

Prep Procedure: RA228

Reviewed By: JRK *[Signature]* Review Date: 10/1/2008

Non-Routine Pre-Treatment? Y / ☒ Batch: *RA*

Prep QASS / NCR? Y / ☒

RA

Prep SOP: PAI 746 Rev: 8

Prep Analyst: Jeff Kujawa

Prep Date: 10/1/2008

Matrix Class: liquid

Prep Dept: RS

Balance:

Balance:

Samp Num	LabID	QC Type	Dish No.	Init Aliq ml	Fin Aliq ml	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	0822001-1	SMP		1500	1500	Unfiltered			T1,S1	
2	0822001-2	SMP		1500	1500	Unfiltered			T1,S1	
3	0822001-3	SMP		1500	1500	Unfiltered			T1,S1	
4	0822001-4	SMP		1500	1500	Unfiltered			T1,S1	
5	0822001-5	SMP		1500	1500	Unfiltered			T1,S1	

Comments

[Sr-89 spike and carrier spiked onto planchet with 8 mL concentrated HNO3.

Spiked By: Jeff Kujawa

Date: 10/1/2008

Yttrium Added By: N/A

Date:

Witnessed By: Melissa Cromer

Date: 10/1/2008

Witnessed By: N/A

Date:

Tracer/Carrier Solution Information									
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID	
T1	STRONTIUM	247960	2,004.008	pCi/ml	NA	1	ml	RS-006	

Spike Solution Information									
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID	
S1	Sr-89	865.3610.08	2,102.511	DPM/ml	10/01/08	5	ml	RS-015	

Radiochemistry Prep Worksheet

Paragon Analytics

Prep Batch: RA081001-2

Prep Procedure: RA228

Prep Batch Not Validated!!!

Reviewed By: Review Date:

Non-Routine Pre-Treatment? Y / N Batch: Re-Prep? Y / N Batch:

Prep QASS / NCR? Y / N

Prep SOP: PAI 746 Rev: 8

Prep SOP: NONE

Matrix Class: liquid

Prep Analyst: Jeff Kujawa

Prep Date: 10/1/2008

Prep Dept: RS

Balance:

Balance:

Sampl Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0822001-1	SMP		1500	1500	Unfiltered			T1, S1	
2	1	0822001-2	SMP		1500	1500	Unfiltered			T1, S1	
3	1	0822001-3	SMP		1500	1500	Unfiltered			T1, S1	
4	1	0822001-4	SMP		1500	1500	Unfiltered			T1, S1	
5	1	0822001-5	SMP		1500	1500	Unfiltered			T1, S1	

Comments

Sr-89 spike and carrier spiked onto planchet with 8 mL concentrated HNO3.

Spiked By: *JK*

Date: 10/1/08

Date: 10/1/08

Yttrium Added By: *JK*

Date: *JK*

Witnessed By: *JK*

Date: *JK*

Date: *JK*

Tracer/Carrier Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
T1	STRONTIUM	247960	2,004,008	pCi/ml	NA	RS-006

exp 8/1/09

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Sr-89	865.3610.08	2,102.611	DPM/ml	10/01/08	RS-015

exp 7/8/09

Ra-228 Outlier Test

	Beta CPM	Mean 1	Absolute Diff from mean1	Mean 2	Absolute Diff from mean2	% Diff	UCL Mean+5%	LCL Mean-5%
C1 0822001-1	4300.4	4360	59.3184	4333.8055	33.3735	0.77%	4550.49578	4117.11523
C1 0822001-2	4456.9	4360	97.1796	4333.8055	123.1245	2.84%	4550.49578	4117.11523
C1 0822001-3	4463.5	4360	103.7796	4333.8055	129.7245	2.99%	4550.49578	4117.11523
C1 0822001-4	4286.6	4360	73.1204	4333.8055	47.1755	1.09%	4550.49578	4117.11523
C1 0822001-5	4291.2	4360	68.5204	4333.8055	42.5755	0.98%	4550.49578	4117.11523

Mean of all five planchets:

Mean 1 4359.8

Mean of closest four planchets:

Mean 2 4333.8

Criteria: should be within 5%: SOP 743

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-AW
 Counting Unit ID: Orange
 High Voltage Mode: Simultaneous
 Application Revision: C
 Application Version: PA
 Rev.12/29/03 JE

Data file name: RA41002
 Batch ID: RA081001-2
 Count Preset (n): 10
 Batch Ended: 10/2/08 10:26

Background logfile: BKGAB
 Date of Bkg. Cat: 9/28/08
 Alpha efficiency logfile: An241-10/08
 Alpha attenuation calibration: An0907
 Beta efficiency logfile: S488-09/07
 Beta attenuation calibration: S0907

Alpha prog. logfile: n/a
 Alpha prog. attenuation: n/a
 Beta prog. logfile: n/a
 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
$y = b \cdot m^a \cdot (e^{(mass-x0)})$		$y = b \cdot m^a \cdot (e^{(mass-x0)})$	
Alpha b=	1.10120	Beta b=	1.0732
m=	0.99200	m=	0.9995
a=	1.0000	a=	1.0000
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
$y = b \cdot m^a \cdot x$		$y = b \cdot m^a \cdot x$	
a->b xtalk b=	0.1971	b->a xtalk b=	-2.000E-06
a->b xtalk m=	0.9983	b->a xtalk m=	0.0021

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity						Beta Activity					
					Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Cor.Fact.
AT	0822001-1	10/2/08 10:26	10.00	0.0	3.500	0.072	9.031	0.2095	1.101	n/a	n/a	4302.400	1.988	0.5414	0.4175	1.079
																n/a
																n/a

JP 10/6/08

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-AW
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Background logfile: BKGAB
Date of Bkg. Cal: 9/28/08
Alpha efficiency logfile: Am241-1
Alpha attenuation calibration: Am0907
Beta efficiency logfile: Sr89-09/08
Beta attenuation calibration: Sr0907

Alpha Attenuation Calibration $y = b \cdot m^a [e^{-(\text{mass}/x)}]$ Alpha = b	Beta Attenuation Calibration $y = b \cdot m^a [e^{-(\text{mass}/x)}]$ Beta = b
$a = 1.76120$	$a = 1.70792$
$m = 0.99200$	$m = 0.9995$
$x = 1.0000$	$x = 1.0000$
$sd = 0.0050$	$sd = 0.0000$
Alpha to Beta X-talk $y = b \cdot m^a \cdot x$	Beta to Alpha X-talk $y = b \cdot m^a \cdot x$
$a = b$ xtalk = 0.1871	$b = a$ xtalk = $-2.0000e-06$
$a = b$ xtalk = 0.9983	$b = a$ xtalk = 0.00021

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity								Beta Activity							
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.		
A1	0822001-2	10/20/08 10:39	10:00	0.0	4,800	0.072	9,360	0.2085	1.101	n/a	n/a	n/a	4458,900	1,968	0.8472	0.4175	1.079	n/a	n/a	

JP 10/6/08

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-JW
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: RAA1002B
Batch ID: R0851001-2
Count Preset (m): 10
Batch Ended: 10/20/08 10:50

Background logfile: BKGAB
Date of Bkg. Cal: 9/23/08
Alpha efficiency logfile: Am241-1008
Alpha attenuation calibration: Am9907
Beta efficiency logfile: Sr90-09/07
Beta attenuation calibration: Sr9907

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity					Beta Activity					Alpha Attenuation Calibration					Beta Attenuation Calibration				
					Gross CPM	Bkg. CPM	b>a xtlk CPM	a>b xtlk CPM	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Progeny Eff	Progeny Cor.Fact.	Alpha b=	m=	a=	x0=	Beta b=	m=	a=	x0=	Cor.Fact.
AT	0822001-3	10/20/08 10:50	10.00	0.0	3.100	0.072	5.373	0.2095	1.101	n/a	4465.500	1.968	0.5665	0.3715	1.079	1.0120	0.99200	1.0000	0.0000	1.0732	0.9995	1.0000	0.0000	n/a

JP 10/6/08

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-AW
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Data file name: RAA1002C
Batch ID: R4081001-2
Count Preset (n): 10
Batch Ended: 10/2/08 11:04

Background logfile: BKGAB
Date of Bkg. Cal: 9/29/08
Alpha efficiency logfile: Am241-10/08
Alpha attenuation calibration: Am0907
Beta efficiency logfile: S88-09/07
Beta attenuation calibration: S8907

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
$y = b \cdot m \cdot (c^2 (m_{\text{mass}} \cdot x))$		$y = b \cdot m \cdot (c^2 (m_{\text{mass}} \cdot x))$	
Alpha b=	1.0720	Beta b=	1.0792
m=	0.99200	m=	0.9995
a=	1.0000	a=	1.0000
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
$y = b \cdot m \cdot x$		$y = b \cdot m \cdot x$	
a -> b xtalk b=	0.0171	b -> a xtalk b=	-2.000E-06
a -> b xtalk m=	0.9983	b -> a xtalk m=	0.0021

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity				Beta Activity				Progeny Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Progeny Eff
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Cor.Fact.	Base Eff	Cor.Fact.	Base Eff				
A1	0822001-4	10/2/08 11:04	10:00	0.0	4.400	0.072	9.002	0.2085	1.101	0.4175	1.079	0.8098	n/a	n/a	n/a	n/a

JP X 10/6/08
AP 10/6/08

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-AW
 Counting Unit ID: Orange
 High Voltage Mode: Simultaneous
 Application Revision: C
 Application Version: PA
 Rev.12/29/03-JE

Data file name: RAA1002D
 Batch ID: RA081001-2
 Count Preset (m): 10
 Batch Ended: 10/20/08 11:16

Background logfile: BKGAB
 Date of Bkg. Cal: 9/28/08
 Alpha efficiency logfile: Am241-1008
 Alpha attenuation calibration: Am0907
 Beta efficiency logfile: S89-09/07
 Beta attenuation calibration: SC0907

Alpha prog. logfile: n/a
 Alpha prog. attenuation: n/a
 Beta prog. logfile: n/a
 Beta prog. attenuation: n/a

Alpha Attenuation Calibration $y = b \cdot m^2 / (e^{(m \cdot a - x)})$	Beta Attenuation Calibration $y = b \cdot m^2 / (e^{(m \cdot a - x)})$
Alpha b= 1.10120	Beta b= 1.0792
m= 0.99280	m= 0.9985
a= 1.0000	a= 1.0000
x0= 0.0000	x0= 0.0000
Alpha to Beta X-talk $y = b \cdot m^2 \cdot x$	Beta to Alpha X-talk $y = b \cdot m^2 \cdot x$
a->b xtalk b= 0.1871	b->a xtalk b= -2.000E-06
a->b xtalk m= 0.9983	b->a xtalk m= 0.0021

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity						Beta Activity					
					Gross CPM	Bkg. CPM	a>b xtlk CPM	a>b xtlk CPM	Progeny Eff	Progeny Cor.Fact.	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Base Eff	Base Cor.Fact.
A1	0822001-S	10/20/08 11:16	10.00	0.0	3.600	0.072	9.012	0.2095	1.101	n/a	0.2095	1.101	0.4175	1.079	n/a	n/a

JP 10/6/08

Radiochemistry Solution Report

Solution Id: 247960 Name: Strontium Carrier+1<4>

Type: IS

Lot:

Vendor Name:

Final Vol: 1000 Units: mL Matrix: LIQUID
 Dept: RS Location: SR/RA ExpireDate: 8/4/2009
 Prep By DBC on 8/3/2007 Reviewed By JRK on 8/28/2007
 Opened By on on Verified By DBC on 8/3/2007
 Received By on on Deactivated By on on

Comment:

Component Name

Strontium Stable Carrier Source<1>

Component ID

8256 Y07595

Volume Added

4.8406

Units

g

Calibrated Primary Calibration Reference

CompName	Act/Conc	Date	1/2 Life (Yrs)	Final Act/Conc	Summed Conc	Units
STRONTIUM	414000	10/21/2008		2004.008		pCi/ml

Associated Parent IDs

8256 Y07595

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
 NE = Not Entered

(Prnt) = Secular equilibrium; parent half life used to calculate concentration.

Date Printed: Tuesday, October 21, 2008

Paragon Analytics

A Division of Datachem Laboratories

Standards DB Version: 1.09

JDD 6/24/08

Prepare a working dilution of ~~RSO# 865~~ at $\sim 10,000$ dpm
~~RSO# 865.3610.07~~
 JDD 6/24/08

1) Density of 0.1 M HCl lot #068438 balance
 Mass of 100 ml volumetric flask 68.2945 g 12
 Mass of flask + 100 ml Acid 168.0504 g 12
 Net Mass of Acid ~~99.7554 g~~ 99.7509 g
~~JDD 7/10/08 $\rho = 0.997554 \text{ g/ml}$~~
~~0.997554 g/ml~~

2) Transfer Std.
 Mass of empty vial (No lid) 21.6922 g 12
 Mass of vial + std. Transferred 34.6989 g 12
 Net Mass of Std. Transferred 13.0067 g

3) Dilute w/ 0.1 M HCl
 Mass of Std, diluent, and vial 60.7240 g 12
 Mass of Vial 21.6922 g 12
 Net Mass of Dilution 39.0318 g

Activity Calculation

$$\left(30462.32 \frac{\text{dpm}}{\text{g}} \right) \left(13.0067 \text{ g} \right) \left(\frac{0.997509 \text{ g/ml}}{39.0318 \text{ g}} \right) = 10125.80 \frac{\text{dpm}}{\text{ml}}$$

JDD 7/10/08

Std ID: 865.3610.08

MC 8/18/08

Description: Sr-89

Expiration: 7/8/2009

Activity: 10125.80 dpm/ml

2s Uncertainty: 172.14 dpm/ml

Ref. Date: 6/9/2008

Ref Time: N/A

Prep Date: 6/24/2008 Prep by: jdd

Matrix/Comp: 0.1 M HCl

Half Life (y): 1.38E-01

Reverification Log

Analysis Date Initials Expiration Date

MC 8/18/08

Continued on Page


Read and Understood By



Signed

6/24/08

Date



Signed

7/10/08

Date



Eckert & Ziegler

Analytics

RSO #
865

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytiscinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

77540-307

Sr-89 50 mL Liquid in Flame Sealed Vial

Customer: Paragon Analytics
P. O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-89
Activity (Bq):	2.557 E4
Half-Life:	50.53 days
Calibration Date:	June 9, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7 %

Comments:

Impurities: γ -impurities <0.1%
50.36376 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

Source Prepared By: _____

W. Mao, Radiochemist

QA Approved: _____

D. M. Montgomery, QA Manager

Date: 6-19-08

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

114 of 217

Internal Calculation Verifications

ICBs

&

ICVs

Sr-89/Ra228 ICV/ICB
LB4100-A

Detector	Sample ID	Sampling Date & Time	Ingrowth Date & Time	Decay Date & Time	Cnt Start Date & Time	Initial Vol	Final Vol	Count Dur	Gross CPM	Bkg CPM	Efficiency	Ba Yield	Y Yield	Total Yield	Net CPM	Activity pCi/Vol	TPU 2 sig	MDC	% Rec
A3	RA0810002-AMB	10/2/2008 12:00	10/3/2008 16:00	10/13/2008 10:55	10/13/2008 13:37	1.50	1.494	250	1.900	2.044	0.4168	0.912	0.678	0.618	-0.144	-0.29	0.40	0.86	
C1	RA0810002-BMB	10/2/2008 12:00	10/3/2008 16:00	10/13/2008 10:55	10/13/2008 13:37	1.50	1.494	250	1.848	1.716	0.4367	0.860	0.679	0.584	0.132	0.27	0.39	0.80	
C4	RA0810002-CMB	10/2/2008 12:00	10/3/2008 16:00	10/13/2008 10:55	10/13/2008 13:37	1.50	1.494	250	1.860	1.794	0.4321	0.897	0.655	0.587	0.066	0.13	0.39	0.82	
A1	0822003-1	10/2/2008 12:00	10/3/2008 16:00	10/13/2008 10:55	10/13/2008 13:37	1.50	1.494	250	11.036	1.979	0.4244	0.861	0.691	0.595	9.057	18.48	5.56	0.87	113.3%
A4	0822003-2	10/2/2008 12:00	10/3/2008 16:00	10/13/2008 10:55	10/13/2008 13:37	1.50	1.494	250	9.980	1.979	0.4119	0.918	0.714	0.655	8.001	15.27	4.60	0.81	93.6%
C2	0822003-3	10/2/2008 12:00	10/3/2008 16:00	10/13/2008 10:55	10/13/2008 13:37	1.50	1.494	250	11.072	1.689	0.4558	0.916	0.683	0.625	9.373	16.94	5.09	0.71	103.8%

Spike Information

Sample ID	Spike ID	Ref Date	Ra-228 Act DPM/mL	Spike Vol mL	Ra-228 Act Added
RA0810002-AMB	784.3020.38	10/2/2008	54.32	0.0	0.0
RA0810002-BMB	784.3020.38	10/2/2008	54.32	0.0	0.0
RA0810002-CMB	784.3020.38	10/2/2008	54.32	0.0	0.0
0822003-1	784.3020.38	10/2/2008	54.32	1.0	16.3
0822003-2	784.3020.38	10/2/2008	54.32	1.0	16.3
0822003-3	784.3020.38	10/2/2008	54.32	1.0	16.3

Ra-228 Decay	Ac-228 Ingrowth	Ac-228 Decay	Cnt Time Ingrowth	Cnt Time Adj.	K
0.9964	1.0000	0.7369	0.3757	0.4711	0.2358
0.9964	1.0000	0.7369	0.3757	0.4711	0.2333
0.9964	1.0000	0.7369	0.3757	0.4711	0.2322
0.9964	1.0000	0.7369	0.3757	0.4711	0.2309
0.9964	1.0000	0.7369	0.3757	0.4711	0.2469
0.9964	1.0000	0.7369	0.3757	0.4711	0.2607

1 sig CU	1 sig TPU
0.1962	0.2008
0.1927	0.1967
0.1950	0.1960
0.4383	2.7777
0.3905	2.2989
0.3875	2.5434

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Radiochemistry Instrument Worksheet

Paragon Analytics

Prep Batch: RA081002-2

Prep Procedure: RA228

Analytical QASS / NCR? Y / N N/A

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	0822003-1	SMP	1500	1494.2	ml	PC/L		RAA1013	JP							
1	0822003-2	SMP	1500	1494.2	ml	PC/L		4								
1	0822003-3	SMP	1500	1494.2	ml	PC/L		10								
1	RA081002-2A	MB	1500	1494.2	ml	PC/L		3								
1	RA081002-2B	MB	1500	1494.2	ml	PC/L		9								
1	RA081002-2C	MB	1500	1494.2	ml	PC/L		12								JP 12/21/08

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	YTTRIUM	247966	9,004.855	pCi/ml	NA	1	ml	RS-006
T2	BARIUM	247969	16,022.965	ppm	NA	2	ppm	RS-009

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Ra-228	784.3020.38	54.320	DFM/ml	10/02/08	1	ml	RS-006

Reporting Units

Sample Barcodes

0822003-1 RA081002-2PS1		0822003-2 RA081002-2PS2	
0822003-3 RA081002-2PS3		RA081002-2AMB RA081002-2PS4	
RA081002-2BMB RA081002-2PS5		RA081002-2CMB RA081002-2PS6	
RA081002-2CAR RA081002-2PS7			

Radiochemistry ICP Worksheet

Paragon Analytics

Prep Batch: RA081002-2

Prep Procedure: RA228

Reviewed By: MOC *moc* Review Date: 10/14/2008

BARIUM Recovery Results

Reference Carrier

LabID	QC Type	Car Vol	Ref Carr Dil Vol	Ref Carr ICP Alq	Ref Carr ICP Dil Vol	Ref Carr ICP Run	Ref Carr ICP Conc
RA081002-2	CAR	2	1502	1	10	IR081014-1A1	2.288804

Samples

Prep Num	LabID	QC Type	Init Samp Vol (ml)	Car Vol (ml)	Samp Dil Vol (ml)	Init ICP Alq (ml)	Init ICP Dil Vol (ml)	Pre-Con (ml)	Post-Con (ml)	Pre-Sep Vol (ml)	Post-Sep Vol (ml)	Fin ICP Alq (ml)	Fin ICP Dil Vol (ml)	Initial ICP Run	Final ICP Run	Init ICP Conc (ug/ml)	Fin ICP Conc (ug/ml)	Init Samp Mass (ug)	Ref Mass (ug)	Flag	Fin Samp Mass (ug)	% Yield	Final Sample Alq
1	0822003-1	SMP	1500	2	26	0.1	1000	25.9	25.9	25.9	55	0.1	1000	IR081014-1A1	IR081014-1A1	0.13859	0.056162	35895.27	34245.61		30889.02	86.05%	1494
1	0822003-2	SMP	1500	2	26	0.1	1000	25.9	25.9	25.9	55	0.1	1000	IR081014-1A1	IR081014-1A1	0.13451	0.05812	34838.84	34245.61		31985.85	91.75%	1494
1	0822003-3	SMP	1500	2	26	0.1	1000	25.9	25.9	25.9	55	0.1	1000	IR081014-1A1	IR081014-1A1	0.13413	0.057848	34740.24	34245.61		31816.29	91.56%	1494
1	RA081002-2A	MB	1500	2	26	0.1	1000	25.9	25.9	25.9	55	0.1	1000	IR081014-1A1	IR081014-1A1	0.13272	0.056978	34374.01	34245.61		31337.7	91.17%	1494
1	RA081002-2B	MB	1500	2	26	0.1	1000	25.9	25.9	25.9	55	0.1	1000	IR081014-1A1	IR081014-1A1	0.13145	0.053569	34045.34	34245.61	LB	29463.21	86.04%	1494
1	RA081002-2C	MB	1500	2	26	0.1	1000	25.9	25.9	25.9	55	0.1	1000	IR081014-1A1	IR081014-1A1	0.13261	0.056035	34345.84	34245.61		30819.22	89.73%	1494

YTTRIUM Recovery Results

Reference Carrier

LabID	QC Type	Car Vol	Ref Carr Dil Vol	Ref Carr ICP Alq	Ref Carr ICP Dil Vol	Ref Carr ICP Run	Ref Carr ICP Conc
RA081002-2	CAR	1	50	0.5	10	IR081014-1A1	9.000888

Samples

Prep Num	LabID	QC Type	Init Samp Vol (ml)	Car Vol (ml)	Samp Dil Vol (ml)	Init ICP Alq (ml)	Init ICP Dil Vol (ml)	Pre-Con (ml)	Post-Con (ml)	Pre-Sep Vol (ml)	Post-Sep Vol (ml)	Fin ICP Alq (ml)	Fin ICP Dil Vol (ml)	Initial ICP Run	Final ICP Run	Init ICP Conc (ug/ml)	Fin ICP Conc (ug/ml)	Init Samp Mass (ug)	Ref Mass (ug)	Flag	Fin Samp Mass (ug)	% Yield	Final Sample Alq
1	0822003-1	SMP	1500	1	50			50	50	50	50	0.5	10	IR081014-1A1	IR081014-1A1	0	6.219281	9000.888	9000.888		6219.281	69.10%	NA
1	0822003-2	SMP	1500	1	50			50	50	50	50	0.5	10	IR081014-1A1	IR081014-1A1	0	6.428292	9000.888	9000.888		6428.292	71.42%	NA
1	0822003-3	SMP	1500	1	50			50	50	50	50	0.5	10	IR081014-1A1	IR081014-1A1	0	6.145034	9000.888	9000.888		6145.034	68.27%	NA
1	RA081002-2A	MB	1500	1	50			50	50	50	50	0.5	10	IR081014-1A1	IR081014-1A1	0	6.105136	9000.888	9000.888		6105.137	67.83%	NA
1	RA081002-2B	MB	1500	1	50			50	50	50	50	0.5	10	IR081014-1A1	IR081014-1A1	0	6.108583	9000.888	9000.888		6108.583	67.87%	NA
1	RA081002-2C	MB	1500	1	50			50	50	50	50	0.5	10	IR081014-1A1	IR081014-1A1	0	5.890955	9000.888	9000.888		5890.956	65.45%	NA

Radiochemistry ICP Worksheet

Paragon Analytics

Prep Batch: RA081002-2

Total Yield

Prep Num	Lab ID	QC Type	Total Yield
1	0822003-1	SMP	59.46%
1	0822003-2	SMP	65.53%
1	0822003-3	SMP	62.53%
1	RA081002-2A	MB	61.84%
1	RA081002-2B	MB	58.39%
1	RA081002-2C	MB	58.73%

Sample Id1	Al	Ba	Ca	Fe	K	Mg	Na	Pb	Sr	Y
Y 0809222-3	0.0124	0.0061	0.1442	0.0470	-0.0269	-0.0090	0.5070	-0.0015	0.0365	5.4960
Y 0810026-1	0.0153	0.0036	0.1396	0.0732	-0.0160	-0.0114	0.5678	-0.0011	0.0418	5.5317
Y 0810026-2	0.0153	0.0047	0.1458	0.0467	-0.0217	-0.0085	0.5634	-0.0004	0.0632	5.7263
Y RA081008-1MB	0.0271	0.0035	0.1628	0.0387	-0.0106	-0.0124	0.7153	0.0002	0.0359	6.4849
Y RA081008-1LCS	0.0327	0.0051	0.1751	0.0336	-0.0098	-0.0116	0.6425	-0.0002	0.0487	6.7148
CCV	50.3967	0.5025	50.2813	20.7124	19.9913	49.9784	20.6196	0.4939	0.5003	9.9685
CCB	0.0254	0.0000	0.0035	0.0001	-0.0207	0.0061	0.0030	0.0007	0.0000	0.0011
Y RA081008-1LCS	0.0499	0.0059	0.1724	0.0376	-0.0016	-0.0046	0.5311	-0.0002	0.0500	6.5747
RA081008-1RC	0.0220	-0.0002	0.2349	0.0041	-0.0049	-0.0099	-0.0048	-0.0023	0.0000	9.1855
I 0822003-1	0.0291	0.1386	-0.0031	-0.0209	-0.0120	-0.0065	2.1063	0.5816	0.0625	0.0056
F 0822003-1	0.1102	0.0562	-0.0077	-0.0165	-0.0109	-0.0099	13.3248	-0.0022	0.0205	0.0007
I 0822003-2	-0.0002	0.1345	-0.0062	-0.0186	-0.0136	-0.0061	2.0593	0.5939	0.0645	-0.0021
F 0822003-2	0.0226	0.0581	-0.0004	-0.0107	0.0163	-0.0114	13.5269	-0.0011	0.0222	-0.0003
I 0822003-3	-0.0048	0.1341	0.0031	-0.0084	-0.0035	-0.0082	2.0840	0.5898	0.0624	-0.0043
F 0822003-3	-0.0051	0.0578	0.0540	-0.0096	0.0136	-0.0085	13.4066	-0.0017	0.0220	-0.0015
I RA081002-2AMB	-0.0106	0.1327	-0.0081	-0.0155	-0.0128	-0.0090	2.0343	0.5857	0.0628	-0.0045
F RA081002-2AMB	0.0007	0.0570	0.0382	-0.0064	-0.0087	0.0019	13.4133	0.0000	0.0223	-0.0025
CCV	50.7105	0.5008	50.3839	20.7036	20.1022	50.4508	20.6046	0.4937	0.4999	10.0224
CCB	0.0109	0.0001	0.0077	0.0083	-0.0024	0.0087	0.0083	0.0015	0.0001	0.0005
I RA081002-2BMB	-0.0002	0.1314	-0.0008	-0.0125	-0.0084	-0.0029	2.0805	0.5487	0.0580	-0.0043
F RA081002-2BMB	0.0063	0.0536	0.0046	-0.0024	-0.0052	-0.0109	13.3674	-0.0023	0.0179	-0.0010
I RA081002-2CMB	0.0051	0.1326	-0.0039	-0.0268	-0.0193	-0.0041	2.0401	0.5678	0.0511	-0.0048
F RA081002-2CMB	0.0293	0.0560	-0.0023	-0.0065	-0.0217	-0.0116	13.1468	-0.0013	0.0172	-0.0022
RA081002-2RC	0.0199	2.2888	0.0008	-0.0207	-0.0182	-0.0121	0.0164	-0.0010	0.0006	-0.0060
Y 0822003-1	0.0184	0.0074	0.1624	0.0204	-0.0462	-0.0129	0.3900	0.0109	0.0449	6.2193
Y 0822003-2	0.0308	0.0030	0.1550	0.0398	-0.0092	-0.0112	0.4399	-0.0005	0.0274	6.4283
Y 0822003-3	0.0204	0.0048	0.1466	0.0223	-0.0144	-0.0119	0.4926	-0.0019	0.0379	6.1450
Y RA081002-2AMB	0.0187	0.0044	0.1574	0.0172	-0.0245	-0.0131	0.5585	0.0006	0.0366	6.1051
Y RA081002-2BMB	0.0264	0.0080	0.1550	0.0454	0.0079	-0.0097	0.6125	-0.0014	0.0383	6.1086
CCV	50.1866	0.5000	50.6728	20.8411	19.8695	50.0225	20.5034	0.4919	0.4993	9.9883
CCB	0.0259	0.0001	0.0042	0.0029	0.0011	0.0058	0.0046	0.0005	0.0000	0.0010
Y RA081002-2CMB	0.0165	0.0085	0.1493	0.0487	0.0217	-0.0114	0.5657	-0.0003	0.0370	5.8910
RA081002-2RC	0.0126	0.0000	0.2295	-0.0105	0.0033	-0.0097	0.0024	-0.0006	0.0001	9.0009
F 0808083-12	0.0114	0.0001	0.5542	-0.0186	0.0106	0.0022	0.0047	-0.0025	0.6876	0.0044
F 0822007-1	-0.0009	0.0518	-0.0077	-0.0230	0.0114	-0.0124	2.1925	-0.0038	0.0007	-0.0027
F 0822007-2	-0.0017	0.0481	-0.0066	0.0189	0.0239	-0.0129	2.1396	-0.0028	0.0001	-0.0040
F 0822007-3	-0.0036	0.0502	-0.0100	-0.0260	0.0291	-0.0116	2.1139	-0.0021	-0.0001	-0.0050
F 0822007-4	-0.0080	0.0522	-0.0085	-0.0167	0.0182	-0.0124	2.1102	-0.0026	-0.0001	-0.0054
F 0822007-5	-0.0065	0.0499	-0.0050	-0.0268	0.0141	-0.0133	2.1253	-0.0035	-0.0001	-0.0058
RE081010-1MB1	0.0351	0.0510	-0.0089	-0.0208	0.0160	-0.0141	2.0983	-0.0016	-0.0002	-0.0059
RE081010-1MB2	-0.0043	0.0527	0.0035	-0.0219	0.0030	-0.0148	2.1234	-0.0033	-0.0002	-0.0061
RE081010-1MB3	0.0020	0.0514	-0.0035	-0.0146	-0.0052	-0.0049	2.1593	-0.0029	-0.0002	-0.0063
CCV	50.3368	0.4998	50.3615	20.7194	20.0122	50.0669	20.6049	0.4929	0.4986	10.0001
CCB	0.0269	0.0000	0.0050	0.0083	-0.0152	0.0029	0.0035	-0.0004	0.0001	0.0000

Radiochemistry Prep Worksheet

Paragon Analytics

Prep Batch: RA081002-2

Prep Procedure: RA228

Reviewed By: MOC *MC* Review Date: 10/14/2008

Non-Routine Pre-Treatment? ☒ Y ☐ N Batch: *NA*
 Prep SOP: PAI 746 Rev: 8
 Prep SOP: NONE
 Matrix Class: liquid

Prep Analyst: Melissa Cromer
 Prep Date: 10/2/2008
 Prep Dept: RS

Balance: *NA*
 Balance:

Prep QASS / NCR? ☒ Y ☐ N *NA*

Sample Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	0822003-1	SMP	7	1500	1494.231	Unfiltered	10/03/08 16:00	10/13/08 10:55	T1,T2,S1	
2	0822003-2	SMP	8	1500	1494.231	Unfiltered	10/03/08 16:00	10/13/08 10:55	T1,T2,S1	
3	0822003-3	SMP	9	1500	1494.231	Unfiltered	10/03/08 16:00	10/13/08 10:55	T1,T2,S1	
4	RA081002-2A	MB	10	1500	1494.231	Unfiltered	10/03/08 16:00	10/13/08 10:55	T1,T2	<i>NA 10/15/08</i>
5	RA081002-2B	MB	11	1500	1494.231	Unfiltered	10/03/08 16:00	10/13/08 10:55	T1,T2	
6	RA081002-2C	MB	12	1500	1494.231	Unfiltered	10/03/08 16:00	10/13/08 10:55	T1,T2	

Comments

Spiked By: Melissa Cromer Date: 10/2/2008
 Witnessed By: Jeff Kujawa Date: 10/2/2008

Yttrium Added By: Melissa Cromer Date: 10/3/2008
 Witnessed By: Jay Fielding Date: 10/3/2008

Tracer/Carrier Solution Information					
Soln #	Nuclide	SolnID	Prep Conc	Units	Pipet ID
T1	YTTRIUM	247966	9,004.855	pCi/ml	RS-006
T2	BARIUM	247969	16,022.965	ppm	RS-009

Spike Solution Information					
Soln #	Nuclide	SolnID	Prep Conc	Units	Pipet ID
S1	Ra-228	784.3020.38	54.320	DPM/ml	RS-006

Radiochemistry Prep Worksheet

Paragon Analytics

Prep Batch: RA081002-2

Prep Batch Not Validated!!!

Prep Procedure: RA228

Reviewed By: _____ Review Date: _____

Non-Routine Pre-Treatment? Y / N Batch: _____

Re-Prep? Y / N Batch: _____ Prep QASS / NCR? Y / N _____

Prep SOP: PAI 746 Rev: 8

Prep Analyst: Melissa Cromer

Prep Date: 10/2/2008

Balance: _____

Prep Date: 10/2/2008

Balance: _____

Matrix Class: liquid

Prep Dept: RS

Sample Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0822003-1	SMP		1500	1500	Unfiltered	10/3/08 10:30	10/3/08 0:00	T1,T2,S1	bat 10P 26
2	1	0822003-2	SMP		1500	1500	Unfiltered	10/3/08 10:30	10/3/08 0:00	T1,T2,S1	
3	1	0822003-3	SMP		1500	1500	Unfiltered			T1,T2,S1	
4	1	RA081002-2A	MB		1500	1500	Unfiltered			T1,T2	26
5	1	RA081002-2B	MB		1500	1500	Unfiltered			T1,T2	
6	1	RA081002-2C	MB		1500	1500	Unfiltered			T1,T2	

Comments

Spiked By: max Date: 10/2/08

Yttrium Added By: Melissa Cromer Date: 10/3/08

Witnessed By: max Date: 10/2/08

Witnessed By: g Date: 10/3/08

Prep/Carrier Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
T1	YTTRIUM	247966	9,004.855	pCi/ml	NA	1 ml RS-006
T2	BARIUM	247969	16,022.965	ppm	NA	2 ppm RS-009

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Ra-228	784.3020.38	54.320	DPM/ml	10/02/08	1 ml RS-006

Exp. 5/28/09

Exp. 5/2/09

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-A/W
 Counting Unit ID: Orange
 High Voltage Mode: Simultaneous
 Application Revision: C
 Application Version: PA
 Rev.12/29/03 JE

Data file name: RAA1013
 Batch ID: RA081002-2
 Count Preset (m): 250
 Batch Endet: 10/13/08 17:51

Background logfile: BKGAB
 Date of Bkg. Cal: 10/11/08
 Alpha efficiency logfile: Am241-10/08
 Alpha attenuation calibration: Am0907
 Beta efficiency logfile: SRS-10/08
 Beta attenuation calibration: SR0907

Alpha Attenuation Calibration		Beta Attenuation Calibration	
$y = b'm^a/(a'(mass \times x))$		$y = b'm^a/(a'(mass \times x))$	
Alpha b=	1.10120	Beta b=	1.0792
m=	0.99200	m=	0.9995
a=	1.0000	a=	1.0000
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
$y = b'm^a \times x$		$y = b'm^a \times x$	
a -> b xtalk b=	0.1871	b -> a xtalk b=	-2.000E-06
a -> b xtalk m=	0.9983	b -> a xtalk m=	0.0021

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity						Beta Activity							
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
A1	0822003-1	10/13/08 17:48	250.00	0.0	0.180	0.067	0.019	0.2095	1.101	n/a	n/a	11.038	1.979	0.0174	0.4224	1.079	n/a	n/a
A3	RA081002-2AMB	10/13/08 17:48	250.00	0.0	0.048	0.073	0.000	0.2335	1.101	n/a	n/a	1.900	2.044	0.0000	0.4168	1.079	n/a	n/a
A4	0822003-2	10/13/08 17:48	250.00	0.0	0.196	0.035	0.017	0.2296	1.101	n/a	n/a	9.980	1.979	0.0301	0.4119	1.079	n/a	n/a
C1	RA081002-2BMB	10/13/08 17:51	250.00	0.0	0.084	0.064	0.000	0.2238	1.101	n/a	n/a	1.848	1.716	0.0037	0.4367	1.079	n/a	n/a
C2	0822003-3	10/13/08 17:51	250.00	0.0	0.088	0.060	0.020	0.2609	1.101	n/a	n/a	11.072	1.699	0.0052	0.4558	1.079	n/a	n/a
C4	RA081002-2CMB	10/13/08 17:51	250.00	0.0	0.056	0.056	0.000	0.2465	1.101	n/a	n/a	1.860	1.794	0.0000	0.4321	1.079	n/a	n/a

JP 10/20/08

Date 10/13/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	H ₂	JP	P	↓	↓			↓
3		↓							
4									
5	OL								
6									
7									
8									JP 10/13/08
9	JP	P			JP	P			P
10	↓	↓			↓	↓			↓
11									
12									
13	OL								
14									
15									
16									JP 10/13/08

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA1010W			
Dr B	OL			
Dr C	BKA1010W			
Dr D	OL			

Dr = Drawer

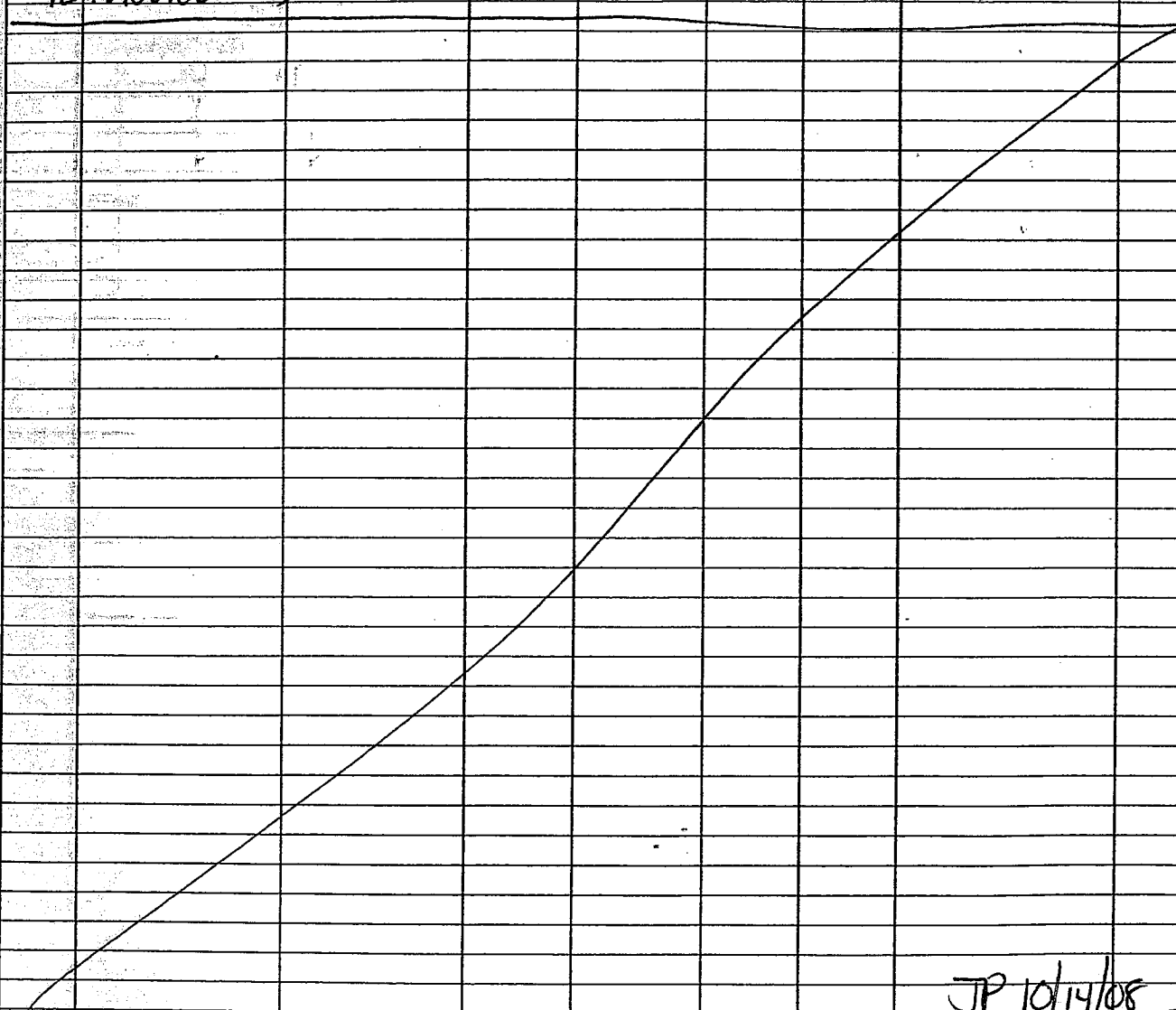
Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	500	Dr A	0.15
	↓	Dr B	↓
Tank 2	850	Dr C	↓
	↓	Dr D	↓

Comments:

Date 10/13/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100A

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-4, 9-12	Daily Eff	---	---	30	7:32	JP	EFA1013	JP
2	Daily Eff	---	---	30	7:42	JP	EFA1013R	JP
1-4, 9-12	Daily Eff	---	---	60	7:51	JP	BKA1013	JP
3, 4	0618015-94, 10A Th230 Attn Curve	---	---	120	8:57	JP	ATH1013	JP
9, 10	↓	↓	---	↓	10:28	JP	ATH1013A	JP
11, 12	↓	↓	---	↓	12:05	JP	ATH1013B	JP
1	0822003-1	RA081002-2	RA228 ICB	250	13:37	JP	RAA1013	JP
3	RA081002-2AMB	↓	ICB	↓	↓	↓	↓	↓
4	0822003-2	↓	↓	↓	↓	↓	↓	↓
9	RA081002-2BMB	↓	↓	↓	↓	↓	↓	↓
10	0822003-3	↓	↓	↓	↓	↓	↓	↓
12	RA081002-2CMB	↓	↓	↓	↓	↓	↓	↓
								
						JP 10/14/08		

Comments:

Date 10/14/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100A

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	↓			↓	H _α	JP	P	↓
3						P			
4	↓	↓			↓				
5	OL								
6									
7									JP 10/14/08
8									
9	JP	P			JP	P			P
10	↓	↓			↓	H _α	JP	P	↓
11						H _α	↓	↓	
12	↓	↓			↓	H _α , B	↓	↓	
13	OL								
14									JP 10/14/08
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKA1010W			
Dr B	OL			
Dr C	BKA1010W			
Dr D	OL			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	300	Dr A	0.15
	↓	Dr B	↓
Tank 2	850	Dr C	↓
	↓	Dr D	↓

Comments:

Radiochemistry Solution Report

Solution Id: 247966	Name: Yttrium Carrier<6>	Lot:	Vendor Name:	Type: IS
---------------------	--------------------------	------	--------------	----------

Final Vol: 1000	Dept: RS	Prep By: EMF	on	2/29/2008	Reviewed By: JRK	on	3/5/2008
Units: mL	Location: SR/RA	Opened By:	on		Verified By: EMF	on	3/1/2008
Matrix: LIQUID	ExpireDate: 3/1/2009	Received By:	on		Deactivated By:	on	

Comment:

Component Name	Component ID	Volume Added	Units
Yttrium Oxide<1>	FA991208	11.4351	g

Calibrated Primary Calibration Reference

CompName	Act/Conc	Date	1/2 Life (Yrs)	Final Act/Conc	Summed Conc	Units
YTTRIUM	787475	10/21/2008		9004.855		pCi/ml

Associated Parent IDs

FA991208

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
NE = Not Entered

(Print) = Secular equilibrium; parent half life used to calculate concentration.

Date Printed: Tuesday, October 21, 2008

Paragon Analytics

A Division of Datachem Laboratories

Standards DB Version: 1.09

Radiochemistry Solution Report

Solution Id: 247969	Name: Barium Carrier (BaCl2 in DI and HNO3)<20>	Type: IR
Lot:	Vendor Name:	

Final Vol: 1000	Dept: RS	Prep By	EMF	on	5/2/2008	Reviewed By	DBC	on	5/5/2008
Units: mL	Location: SR/RA	Opened By		on		Verified By		on	
Matrix: WATER	ExpireDate: 5/2/2009	Received By		on		Deactivated By		on	

Comment:

Component Name	Component ID	Volume Added	Units
BARIUM CHLORIDE<2>	3756B07592	28.5008	g

Calibrated Primary Calibration Reference

CompName	Act/Conc	Date	1/2 Life (Yrs)	Final Act/Conc	Summed Conc	Units
BARIUM	562193.5	10/21/2008		16022.96		pCi/ml

Associated Parent IDs

3756B07592

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
NE = Not Entered

(Print) = Secular equilibrium; parent half life used to calculate concentration.

Date Printed: Tuesday, October 21, 2008

Paragon Analytics

A Division of Datachem Laboratories

Standards DB Version: 1.09

30
PROJECT

784.3020.38 Ra-228

Notebook No. _____

Continued From Page _____

Prepare approx 1L of Ra-228 at a working dilution of approx 50 dpm/ml, in 0.1 M HCl (Fischer Lot 060506)

1) Determine density of 0.1 M HCl

Mass of 100ml "class A" flask = 62.4713g Bal 12
flask + 0.1 M HCl = 162.3059g
Net mass of 100ml 0.1 M HCl = 99.8346g
÷ 100 ml density = 0.9983 g/ml

2) Transfer approx 2 ml 784.3020.37 to 1L Nalgene bottle.

Mass of bottle w/ lid = 75.0497g Bal 12
bottle + std = 77.5697g
Net mass of std = 2.5200g

3) Dilute w/ 0.1 M HCl

Mass of bottle w/ lid (from above) 75.0497g
bottle + diluted std = 1073.4g (Bal 26)
998.4 g

4) Final Activity Calc.

$$\frac{(33,589.8 \text{ dpm/g})(2.5200 \text{ g})(0.9983 \text{ g/ml})}{(998.4 \text{ g})} = 84.6378 \text{ dpm}$$

Std ID: 784.3020.38

RG 8/24/06

RG 8/24/06

Description: Ra-228

Expiration: 6/27/07

Activity: 84.64 dpm/mL

2s Uncertainty: 2.82 dpm/mL

Ref. Date: 1/28/05

Ref Time: N/A

Prep Date: 5/30/06 Prep by: DCB

Matrix/Comp. 0.1M HNO₃

Half Life (y): 5.75E+00

RG 8/24/06

Reverification Log

Analysis Date	Initials	Expiration Date
5/28/08	MBC	5/28/09

ANALYTICS

1380 Seaboard Ind Blvd • Atlanta, GA 30318 • USA • 404-352-8677

Re-228

SRS 70035-307 Qty 6.24E-1 HCl QA 1/1/06

Date 01/28/05 12:00 EST Exp. XXXXXX

PO # 71239; Item 2

5.00994 grams 0.1M HCl solution

CAUTION RADIOACTIVE MATERIAL



RG 8/24/06

Continued on Page _____

[Signature]

Signed

5/30/06

Date

Read and Understood By

[Signature]

Signed

8/24/06

Date

Prepare a primary dilution of (Analytical SRS 70035-307)
 RSO # 784 by diluting contents to approx 40g
 w/ 0.1 N HCl in a 40 ml VOA vial.

1) Prepare 2L 0.1 M HCl by diluting 83 ml conc. HCl, Fischer
 Lot # 060506, in 2L DI water.

2) Transfer contents of ampoule to 40 ml VOA vial.
 Mass of VOA vial w/ lid = 24.9925g (Bal 12)
 vial + STD 784 = 29.7652g
 net std transferal = 4.7727g

3) Dilute w/ 0.1 ^{0.003514/06} M HCl

Mass of vial (from above) = 24.9925g
 vial + std + 0.1 M HCl = 64.2671g (Bal 12)
 net mass of std = 39.2746g

4) Final Activity Calc

$$\frac{(2.308 \times 10^4 \text{ dpm}) (60 \frac{\text{sec}}{\text{min}}) (4.7727 \text{ g})}{(5.00994 \text{ g}) (39.2746 \text{ g})} = 33,589.8 \frac{\text{dpm}}{\text{g}}$$

Continued on Page

Read and Understood By



5/30/06



8/24/06

Signed

Date

Signed

Date



ANALYTICS

RSO # 784
Rec'd 2/2/05
JCS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 - U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

70035-307

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked with a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	2.308 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	January 28, 2005 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities: γ -impurities (other than decay products) <0.1%

5.00994 grams 0.1M HCl solution with 25 $\mu\text{g/g}$ Ba carrier.

P O NUMBER 71239, Item 2

SOURCE PREPARED BY:

M. Dimitrova
M. Dimitrova, Radiochemist

Q A APPROVED:

W. M. R. 2-1-05

Instrument: LB4100-B

Calibration: Sr-89 Flat Planchet(Ra-228)

Date of Calibration: 11/18/2008

Efficiency Log Files: Sr89-11/08

Efficiency Files: ESE1118, ESE1118A,
ESE1118B, ESE1118C

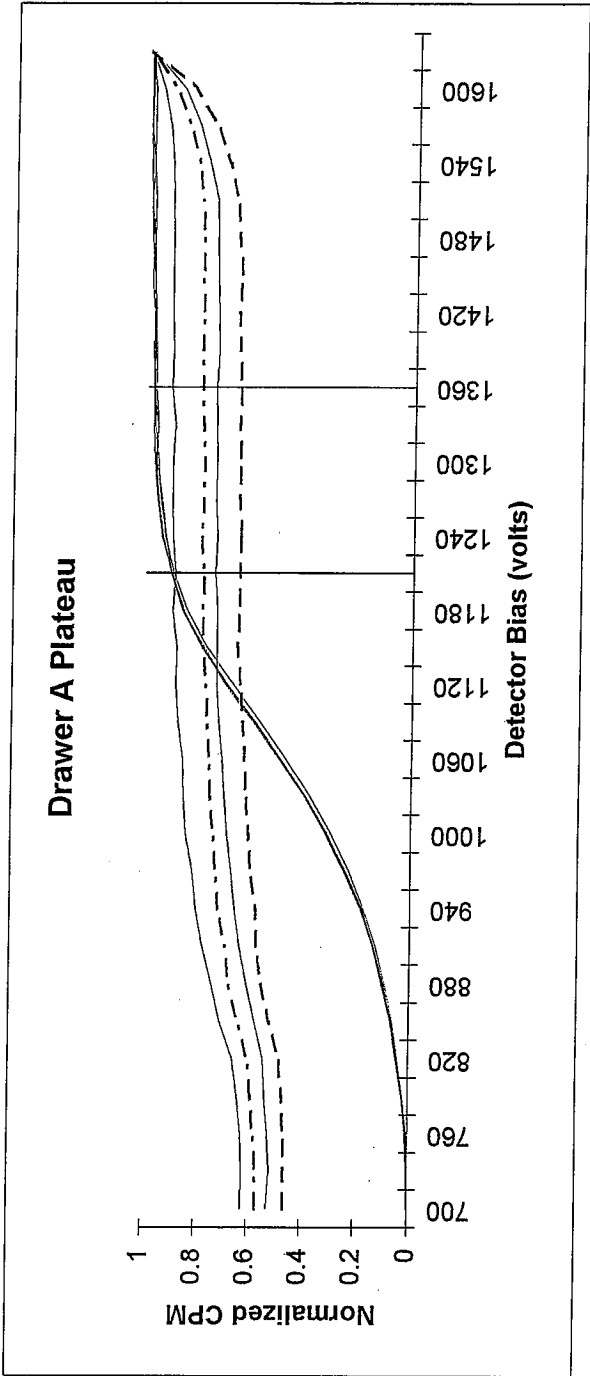
Source ID's: Sr89- 865.3610.08
ICV'S – 784.3020.38

RG
11/24/08

Instrument Plateaus

Unit Type: LB4100/W
Date Performed: 11/6/08 11:47
File Name: PTB1106A
Batch ID: DRAWER A PLATEAU

Unit Id: Aqua
Application Revision: 2
Application Version: Standard



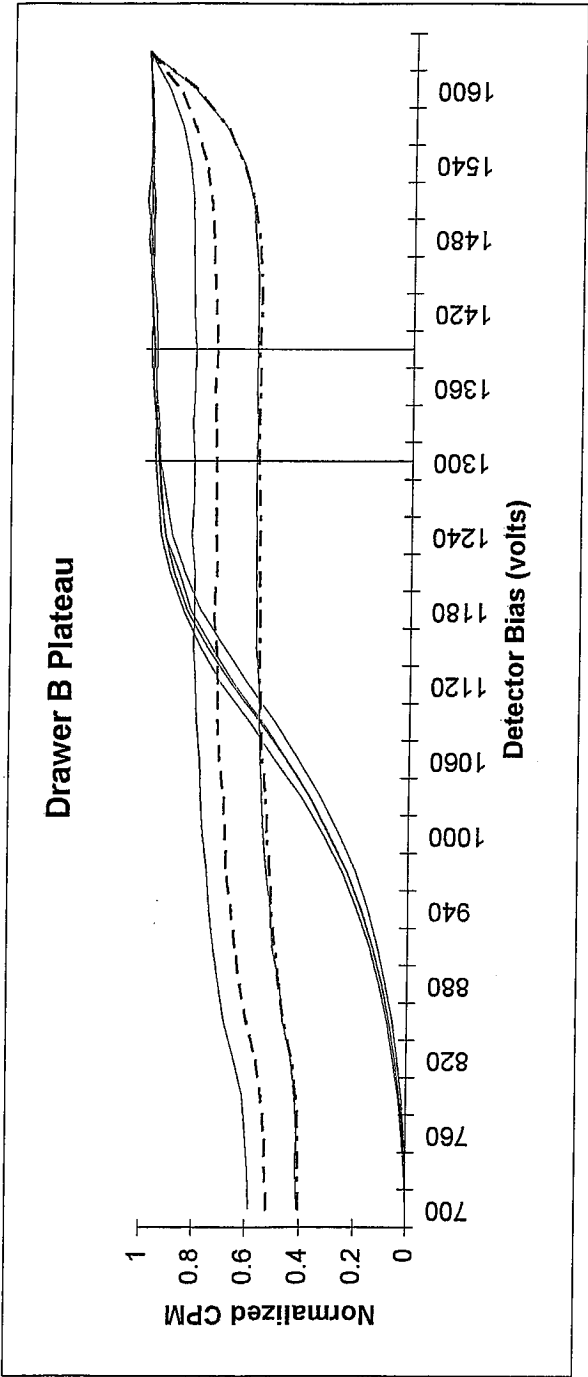
Optimum alpha beta simultaneous operating voltage: 1357.5

Optimum alpha only operating voltage: 1200

	A1	A2	A3	A4
Beta slope at beta voltage	1.22%	1.02%	0.57%	1.07%
Alpha slope at beta voltage	-0.15%	1.51%	0.93%	0.95%
Alpha slope at alpha voltage	0.93%	-0.38%	1.61%	0.50%

Unit Type: LB4100/W
Date Performed: 11/6/08 11:48
File Name: PTB1106B
Batch ID: DRAWER B PLATEAU

Unit Id: Aqua
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: 1402.5

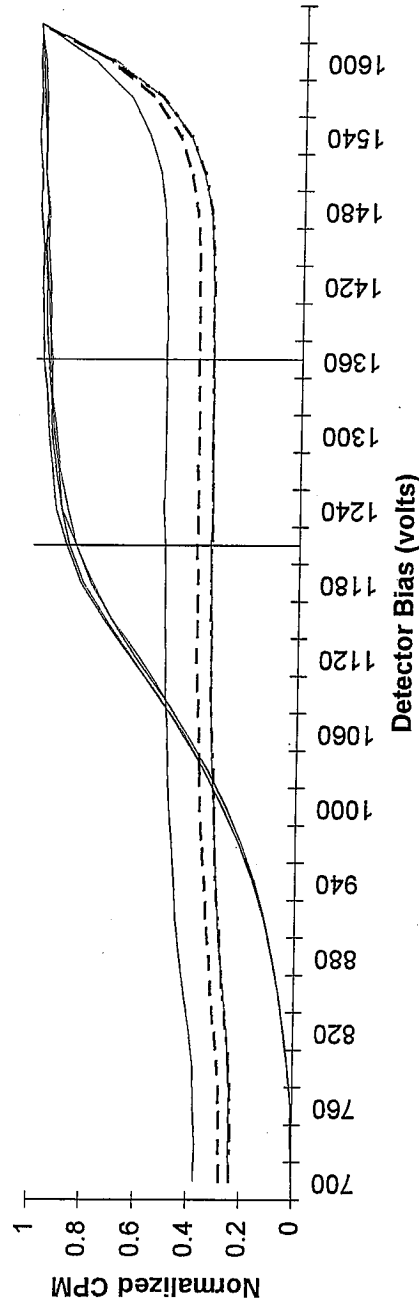
Optimum alpha only operating voltage: 1297.5

	B1	B2	B3	B4
Beta slope at beta voltage	1.78%	1.82%	1.68%	1.99%
Alpha slope at beta voltage	0.29%	0.82%	0.38%	-0.50%
Alpha slope at alpha voltage	-0.34%	0.91%	0.46%	1.04%

Unit Type: LB4100/W
 Date Performed: 11/9/08 08:07
 FileName: PTB1109C
 Batch ID: DRAWER C PLATEAU

Unit Id: Aqua
 Application Revision: 2
 Application Version: Standard

Drawer C Plateau



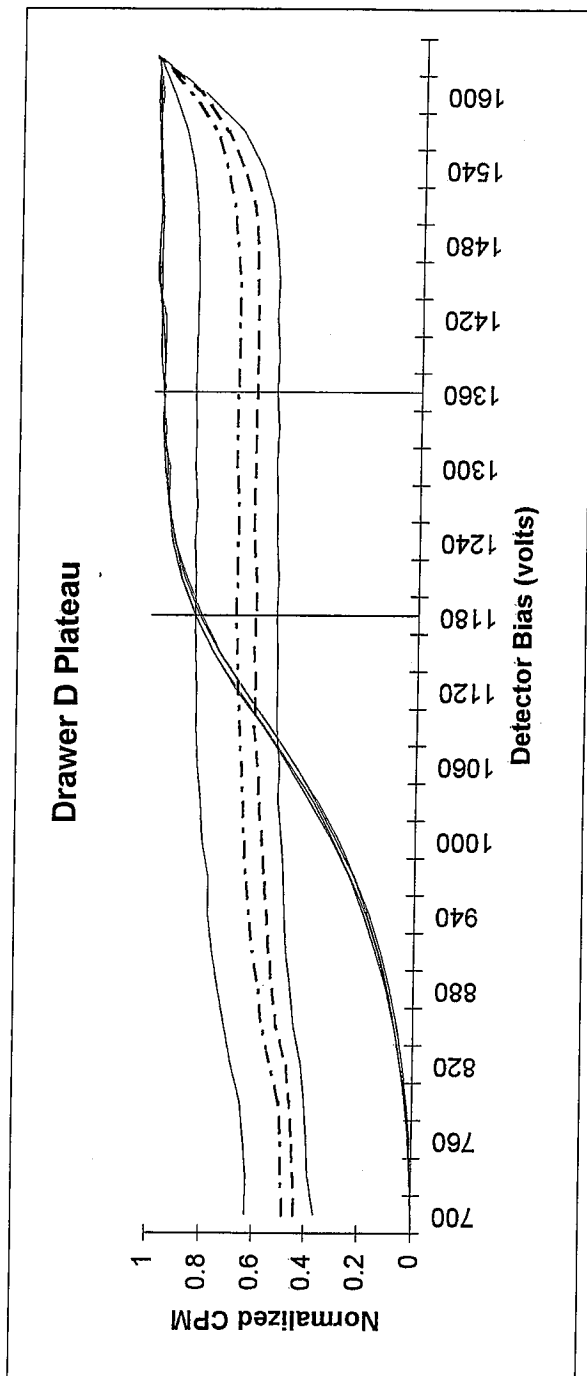
Optimum alpha beta simultaneous operating voltage: **1372.5**

Optimum alpha only operating voltage: **1200**

	C1	C2	C3	C4
Beta slope at beta voltage	2.76%	2.60%	2.54%	2.59%
Alpha slope at beta voltage	0.44%	1.31%	1.24%	0.73%
Alpha slope at alpha voltage	1.31%	1.43%	0.51%	0.05%

Unit Type: LB4100/W
Date Performed: 11/9/08 08:07
FileName: PTB1109D
Batch ID: DRAWER D PLATEAU

Unit Id: Aqua
Application Revision: 2
Application Version: Standard



Optimum alpha beta simultaneous operating voltage: **1372.5**

Optimum alpha only operating voltage: **1170**

	D1	D2	D3	D4
Beta slope at beta voltage	2.16%	1.75%	0.39%	1.85%
Alpha slope at beta voltage	0.99%	-0.19%	-0.01%	-0.38%
Alpha slope at alpha voltage	0.89%	0.87%	1.09%	0.96%

7/11/08 - Daily Efficiency Control limits changed from historical limits ($\bar{x} \pm 3\sigma$) to tolerance limits ($\bar{x} \pm 7.5\%$) due to constructive limits (historical) JP 7/12/08

7/22/08 - Deleted all data from 2006 + 2007 from old data and old data2 folder in file manager JP 7/23/08

7/25/08 All pucks removed from instrument and washed with radiac wash and rinsed with DI water JP 7/25/08

11/6/08 / 11/9/08 Plateaus For Drawers A, B, C, + D

<u>α Sources Used</u>	<u>Detectors</u>	<u>B Sources Used</u>
410 Am 241	A1 B1 C1 D1	Sr/Y 90 - 406
411 17,800 dpm	A2 B2 C2 D2	29,600 dpm 407
412 2/06/95	A3 B3 C3 D3	9/15/02 408
413 ↓	A4 B4 C4 D4	↓ 409

Parameters

Start Voltage: 700
End Voltage: 1650
30 Volt/Step
5 min/Step
40,000 Count ~~Preset~~ Preset
JP 11/10/08

Weak Check Time = 0.1 min
Weak Counts Limit = 10

File names:

PTB1106A
PTB1106B
PTB1109C
PTB1109D

Continued on Page

Signed

11/18/08

Date

Read and Understood By

Signed

11/19/08

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Date 11/6/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100B

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2	↓	LB	JP	P	↓	↓			↓
3	↓	P			↓	↓			↓
4	↓	↓			↓	↓			↓
5	↓	↓			↓	↓			OLB-W
6	↓	↓			↓	↓			P
7	↓	↓			↓	↓			↓
8	↓	↓			↓	↓			↓
9	↓	↓			↓	↓			P
10	↓	↓			↓	↓			↓
11	↓	↓			↓	LB			OLB-W
12	↓	↓			↓	P			P
13	↓	↓			↓	P			P
14	↓	↓			↓	↓			↓
15	↓	↓			↓	↓			↓
16	↓	↓			↓	LB			OLB-D

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKB103/W			
Dr B	↓			
Dr C	↓			
Dr D	↓			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	600	Dr A	0.15
	↓	Dr B	↓
Tank 2	800	Dr C	↓
	↓	Dr D	↓

Comments:

Date 11/6/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100B

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily Eff	—	—	30	7:59	JP	EFB1106	JP
2	Daily Eff	—	—	30	8:14	JP	EFB1106R	JP
1-16	Daily Bkg	—	—	60	8:27	JP	BKCB1106	JP
1-4	Alpha/Beta	—	Plateau	5 Min/Step	11:47	JP	PTB1106A	JP
5-8	Beta/Alpha	—	↓	↓	11:48	JP	PTB1106B	JP
						JP 11/7/08		

Comments:

Page No.: 369653 B
(cont. from page NA B)

Form 780r8.doc (6/23/06)

Reviewed By / Date JP 11/7/08

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Date 11/7/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: **LB4100B**

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2									
3									
4									
5									OLB-W
6									P
7									
8									
9									P
10									
11						LB			OLB-W
12						P			P
13									P
14									
15									
16						LB			OLB-D

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKB1031W	JP	P	BKB1107W
Dr B			#5 → HB, 6-8 P	
Dr C			#11 → HB, 9-10, 12 P	
Dr D			P	

Dr = Drawer

Gas Supply

	P-10 Supply		P-10 Flow
Tank 1	400	Dr A	0.15
	↓	Dr B	↓
Tank 2	800	Dr C	↓
	↓	Dr D	↓

Comments:

Date 11/9/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100B

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			*				P
2									
3									
4									
5									OLB-W
6									P
7									
8									
9									P
10									
11									OLB-W
12									P
13									
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKB1107W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

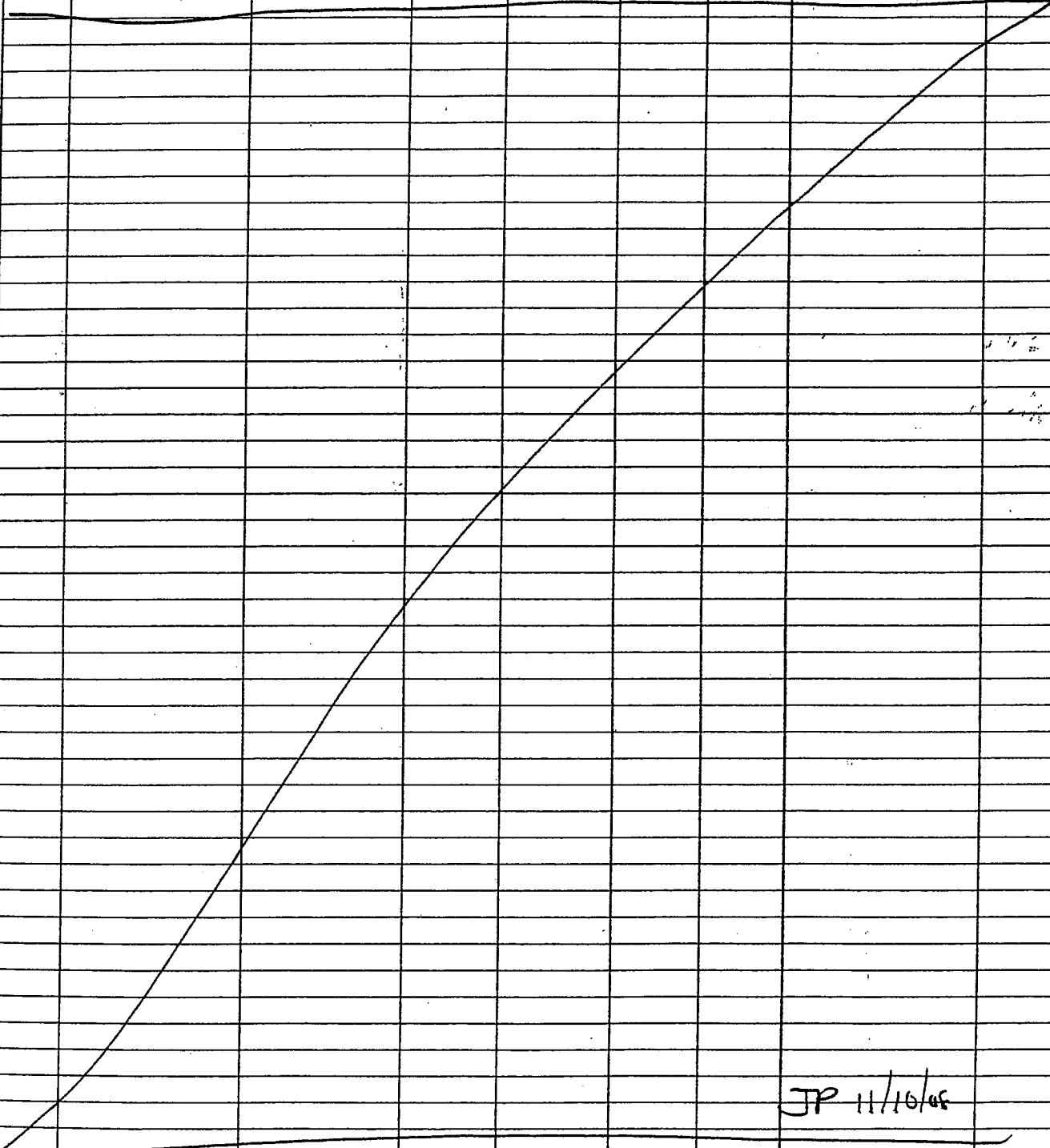
Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	2000	Dr A	0.15
		Dr B	
Tank 2	550	Dr C	
		Dr D	

Comments: * It is not necessary to run daily background checks on the morning following a weekly background calibration. JP 11/10/08

Date 11/9/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100B

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily F/X			30	7:46	JP	EEB1109	JP
9-12	Alpha/Beta	Drawer C Plateau	Plateau	5 min/Step	8:07	JP	PTB1109C	JP
13-16	Beta/Alpha	Drawer D Plateau	↓	↓	↓	↓	PTB1109D	JP
								
						JP 11/10/08		

Comments:

Page No.: **369655** B
(cont. from page NA B)

Form 780r8.doc (6/23/06)

Reviewed By/Date JP 11/10/08

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Date 11/10/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: LB4100B

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2									↓
3									↓
4									↓
5									OLB-W
6									P
7									↓
8									P
9						✓			↓
10									↓
11						HB			OLB-W
12						P			P
13									P
14									↓
15						✓			↓
16	↓	↓			↓	↓			↓

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKB1107W			
Dr B	↓			
Dr C				
Dr D	↓			

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1700	Dr A	0.15
	↓	Dr B	↓
Tank 2	550	Dr C	
	↓	Dr D	↓

Comments:

Instrument ROIs

LB4100 - B Water Sample Counting Parameters

Certainty requirement for MDA and flags
 Maximum count time (min)
 Typical Residual Mass (mg)
 Typical Sample Volume (l)

Action level for flags (pCi/l)
 Activity Multiplier
 Mass Error (%)
 Volume Error (%)

	Alpha		Beta	
	eff.	bkg.	eff.	bkg.
A1	14.38%	0.046	#VALUE!	MDA (pCi/l)
A2	15.31%	0.082	#VALUE!	#VALUE!
A3	15.27%	0.065	#VALUE!	#VALUE!
A4	15.19%	0.068	#VALUE!	#VALUE!

These are the counting parameters sent to the LB4110

Batch Specific:

Event	
Aqua	1
Recycle	0

Drawer Specific:

Date/Time		Bias		Step	
Official		Threshold		Step	
A	11-6-08 11:47	TRUE	1357.5	0	0
B	11-6-08 11:48	TRUE	1402.5	0	0
C	11-9-08 8:07	TRUE	1372.5	0	0
D	11-9-08 8:07	TRUE	1372.5	0	0

Detector Specific:

	Date/Time	Official	Threshold	bLL	BUL	aLL	aUL	Time	bCntPst	bPstTm	aCntPst	aPstTm	bWkCnt	bWkTm	aWkCnt	aWkTm
A1	11-17-08 0:00	TRUE	0.1	0	18.9	34.82	100	30	0	0	0	0	0	0	0	0
A2	11-17-08 0:00	TRUE	0.1	0	21.12	39.95	100	30	0	0	0	0	0	0	0	0
A3	11-17-08 0:00	TRUE	0.1	0	19.92	36.58	100	30	0	0	0	0	0	0	0	0
A4	11-17-08 0:00	TRUE	0.1	0	20.92	38.68	100	30	0	0	0	0	0	0	0	0
B1	11-17-08 0:00	TRUE	0.1	0	39.6	73.87	100	30	0	0	0	0	0	0	0	0
B2	11-17-08 0:00	TRUE	0.1	0	35.7	67.44	100	30	0	0	0	0	0	0	0	0
B3	11-17-08 0:00	TRUE	0.1	0	30.06	56.04	100	30	0	0	0	0	0	0	0	0
B4	11-17-08 0:00	TRUE	0.1	0	34.6	65.44	100	30	0	0	0	0	0	0	0	0
C1	11-17-08 0:00	TRUE	0.1	0	23.88	46.69	100	30	0	0	0	0	0	0	0	0
C2	11-17-08 0:00	TRUE	0.1	0	23.73	45.2	100	30	0	0	0	0	0	0	0	0
C3	11-17-08 0:00	TRUE	0.1	0	23.12	45.78	100	30	0	0	0	0	0	0	0	0
C4	11-17-08 0:00	TRUE	0.1	0	24.05	45.29	100	30	0	0	0	0	0	0	0	0
D1	11-17-08 0:00	TRUE	0.1	0	22.49	43.51	100	30	0	0	0	0	0	0	0	0
D2	11-17-08 0:00	TRUE	0.1	0	22.9	43.49	100	30	0	0	0	0	0	0	0	0
D3	11-17-08 0:00	TRUE	0.1	0	25.9	47.88	100	30	0	0	0	0	0	0	0	0
D4	11-17-08 0:00	TRUE	0.1	0	25.17	46.05	100	30	0	0	0	0	0	0	0	0

11/17/08 ROI's set for all drawers using Sr90/Y90 planchets from Plateaus

11/18/08 Interim control limits set for efficiency and background calibrations. Efficiency control limits are 11/18/08 efficiency calibration check $\pm 10\%$. Background control limits are 11/17/08 background calibration $\pm 3\sigma$ counting uncertainty. Historical control limits will be set following the acquisition of 30 data points for efficiency and 10 data points for background calibrations.

11/18/08 Am 241 Wipe Calibration

Source: #746 Source ID: 1181 Logfile Am241Wipe-11/08

Filenames: EAW1118, A \rightarrow O

α to B crosstalk was calculated for each detector using the following equation: $\frac{\text{counts in Beta Channel}}{\text{counts in Alpha Channel}}$

11/18/08 Sr 90 Wipe Calibration

Source: #602 Source ID: 1182 Logfile: Sr90Wipe-11/08

Filenames: ESW1118, A \rightarrow O

B to α crosstalk was calculated for each detector using the following equation: $\frac{\text{Counts in Alpha Channel}}{\text{Counts in Beta Channel}}$

Continued on Page

Read and Understood By

Signed

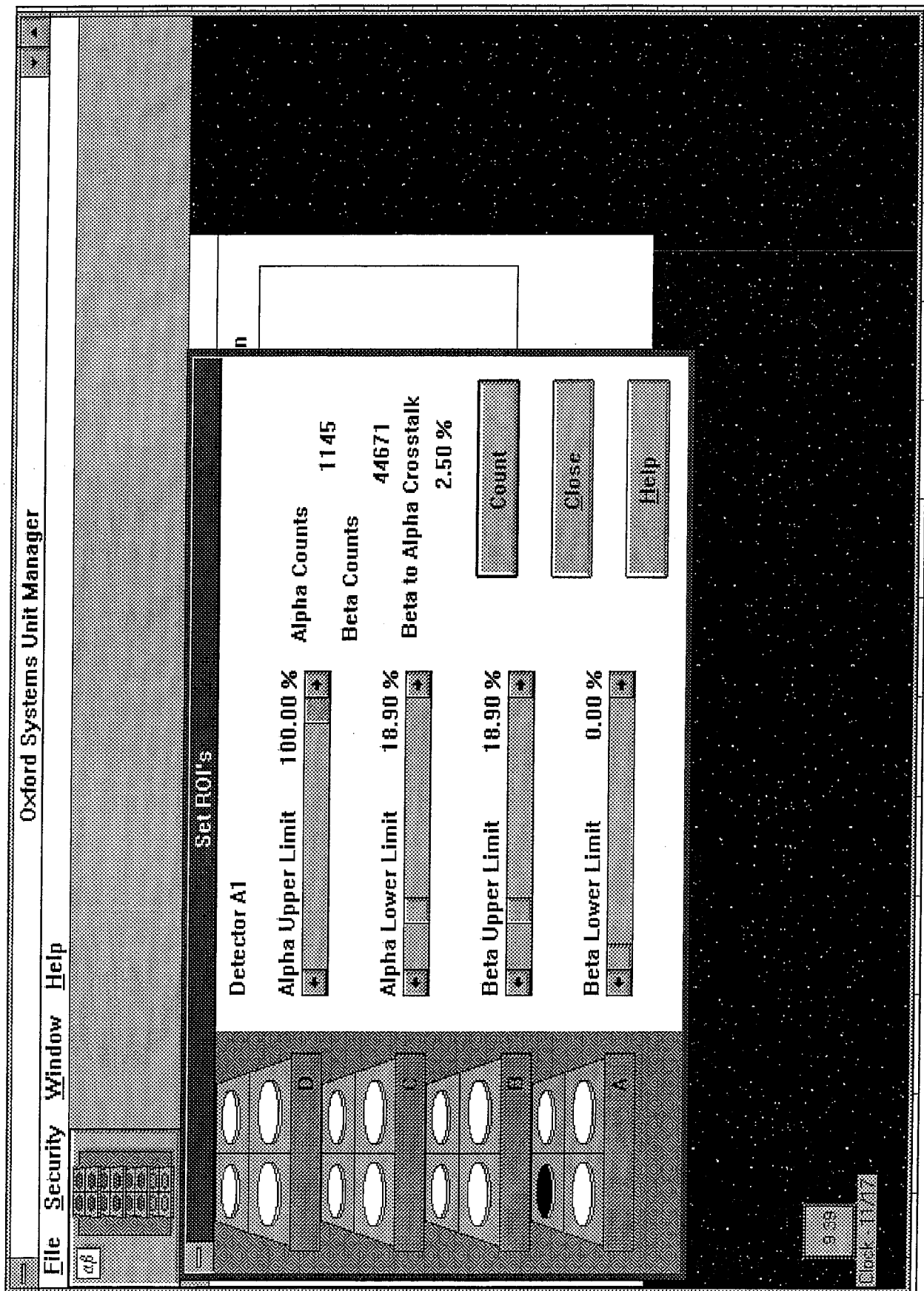
11/18/08

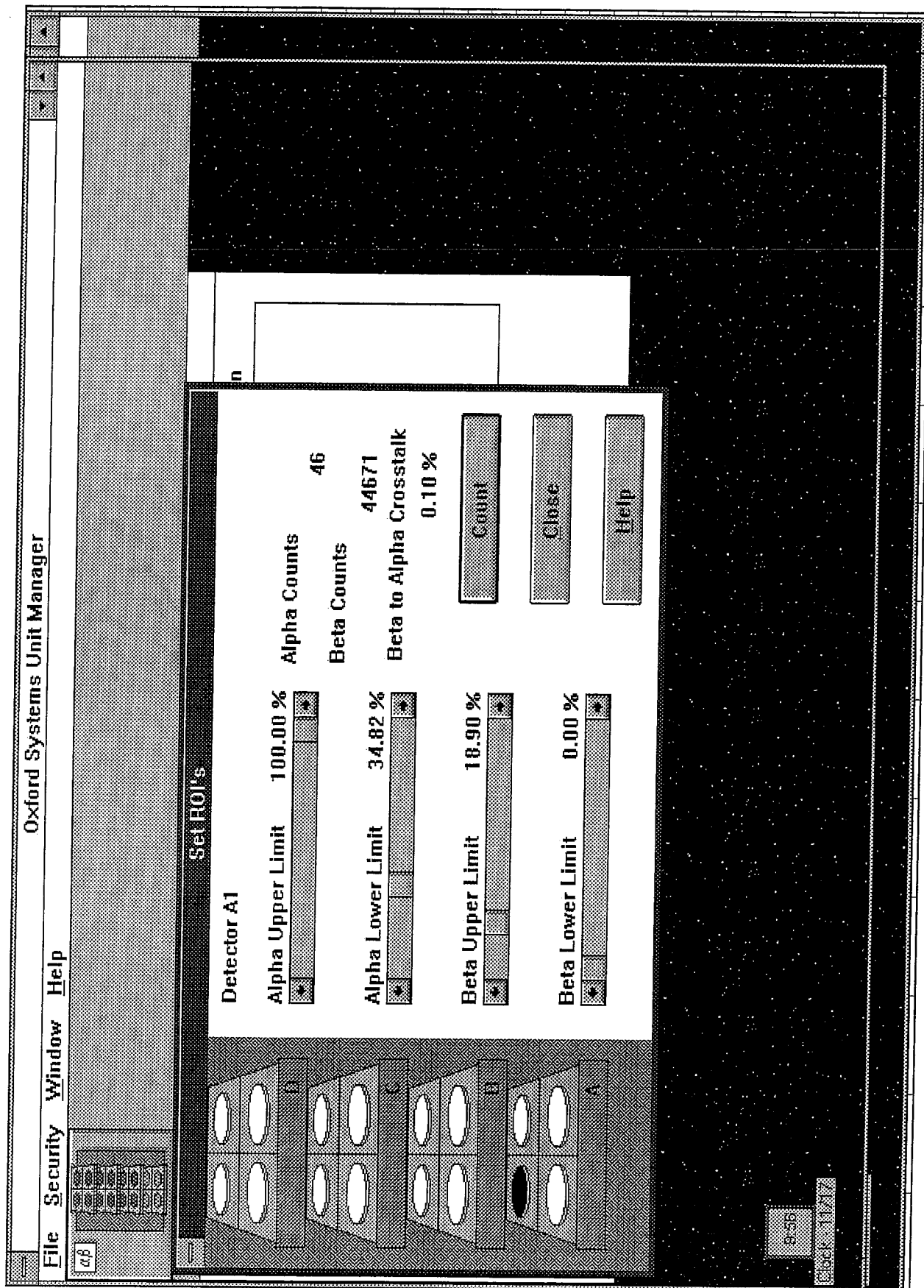
Date

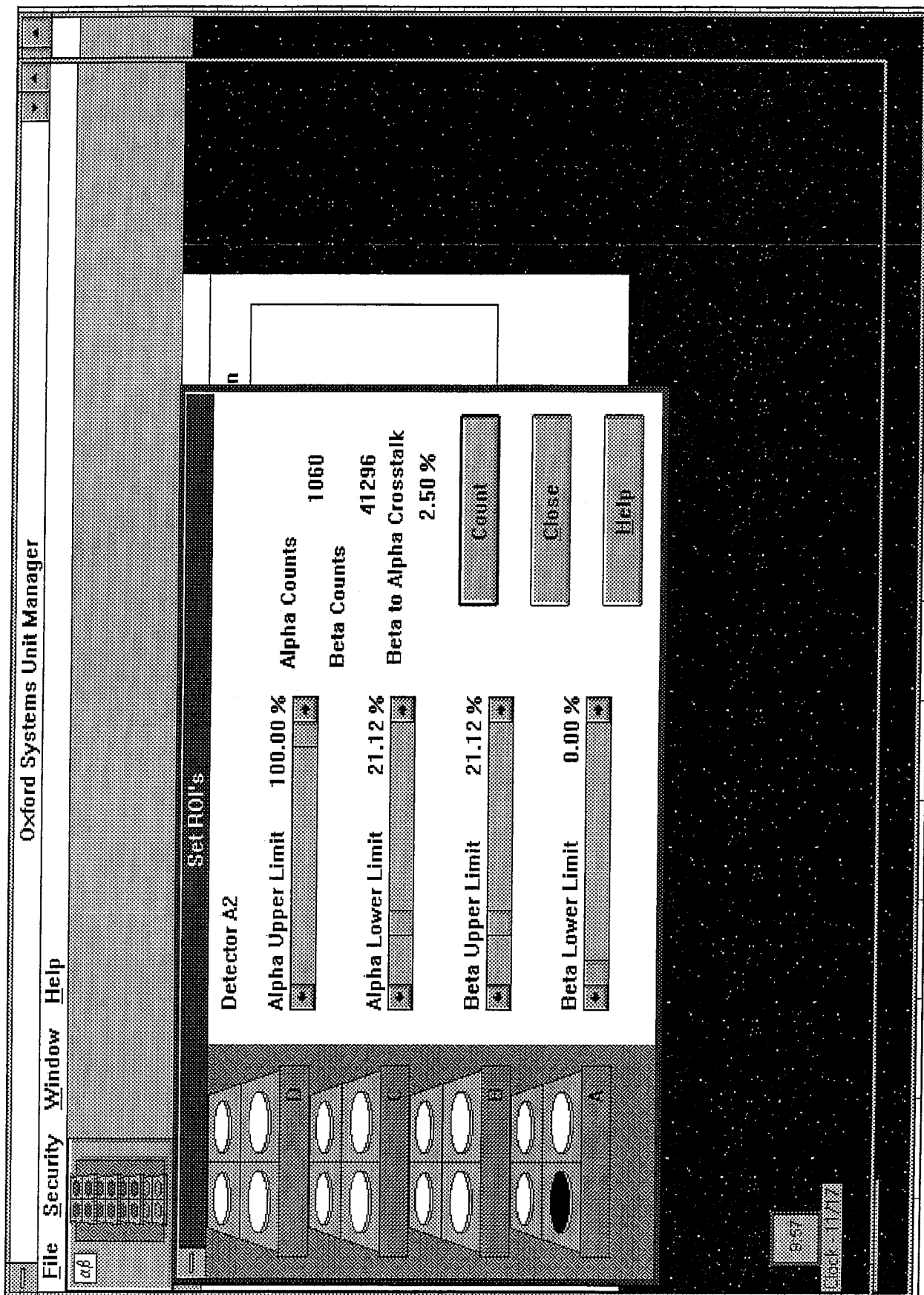
Signed

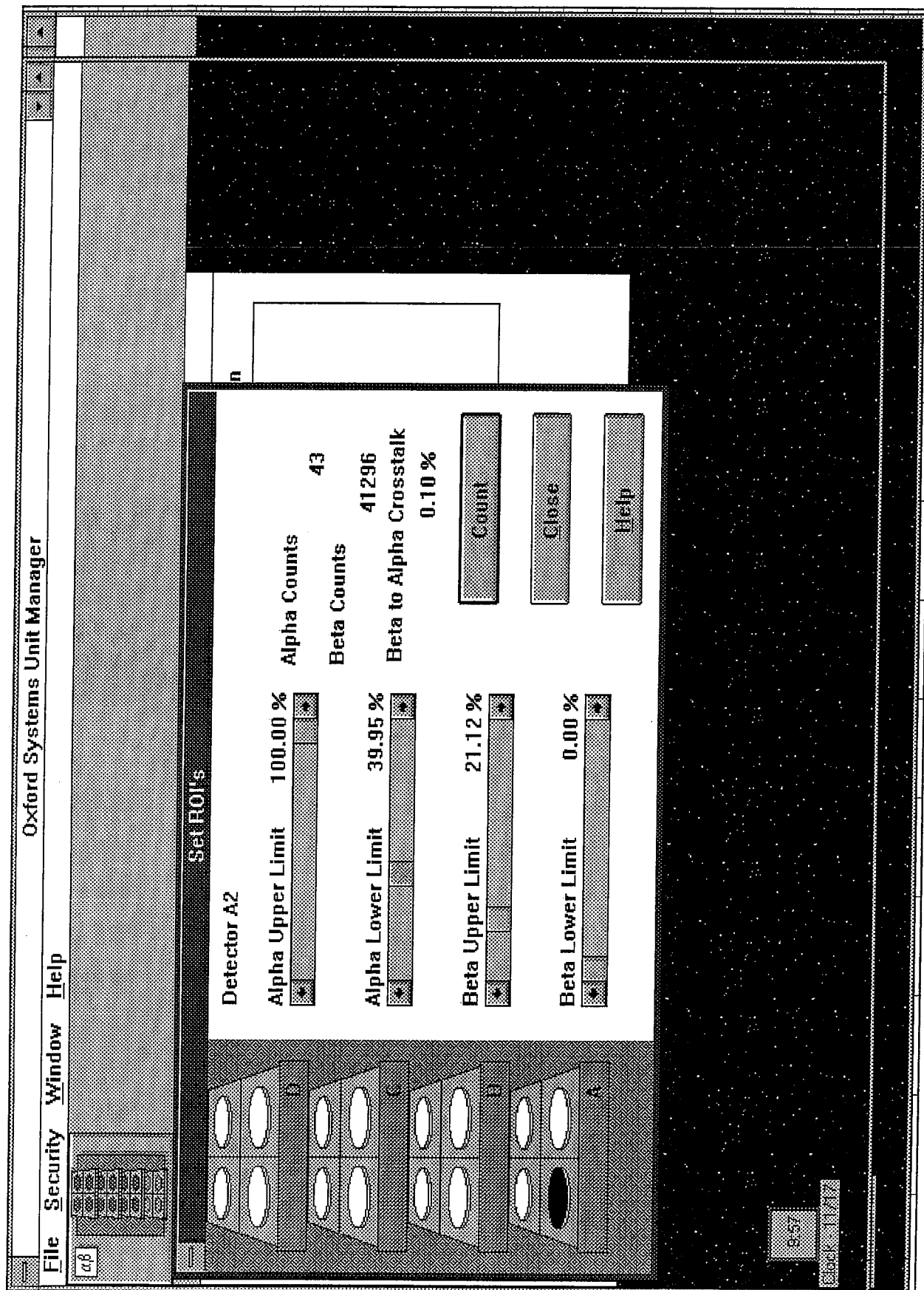
11/19/08

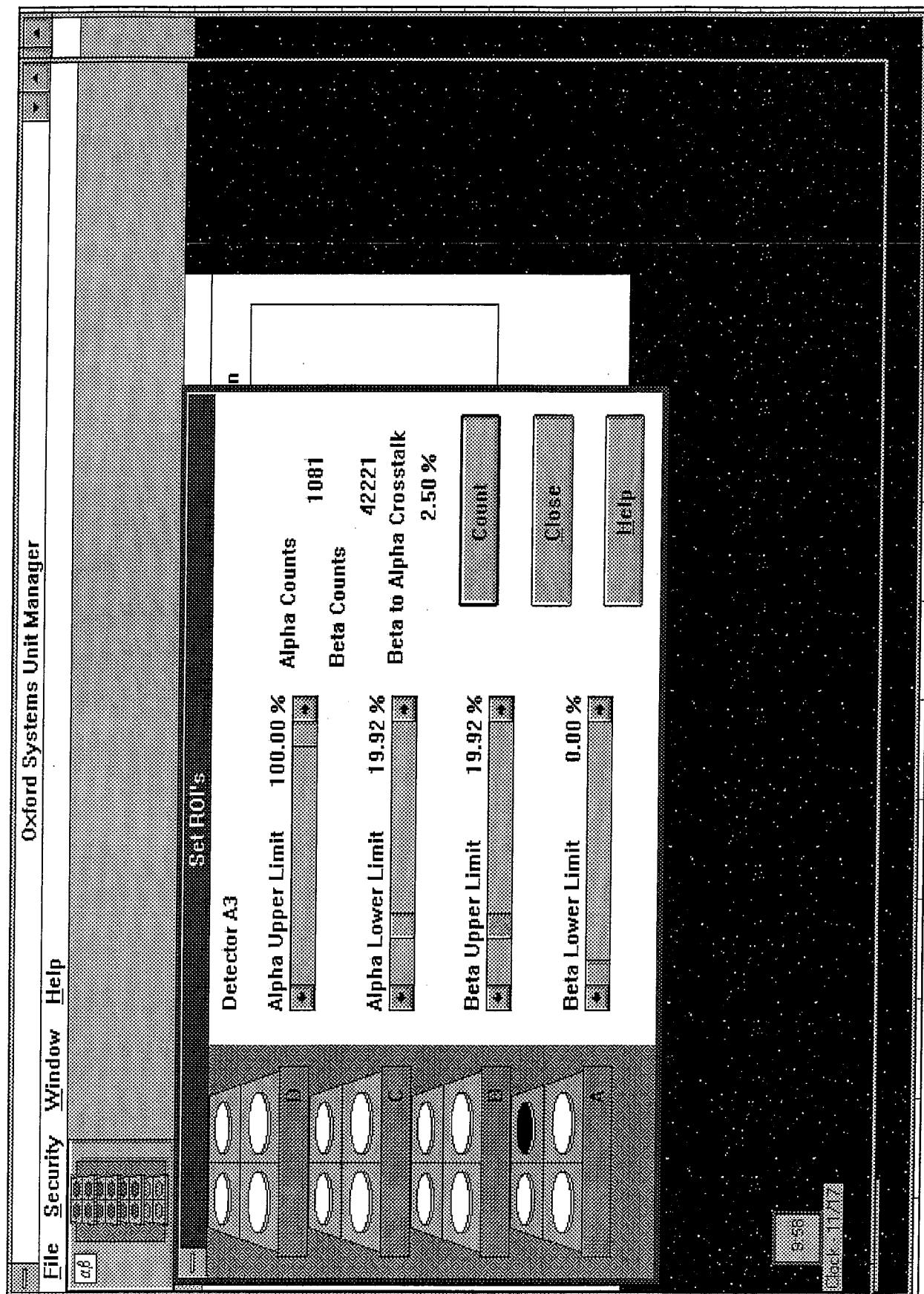
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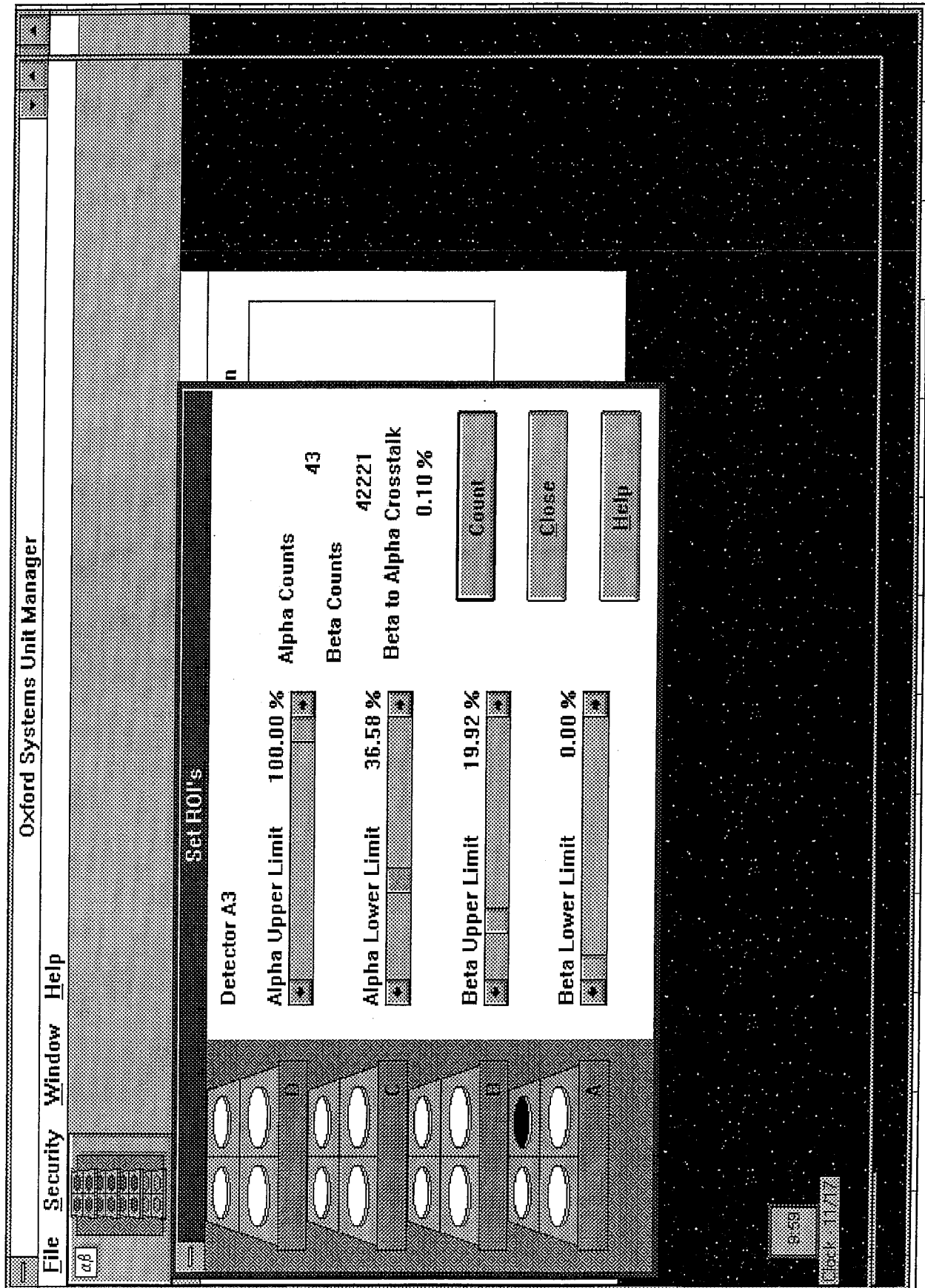


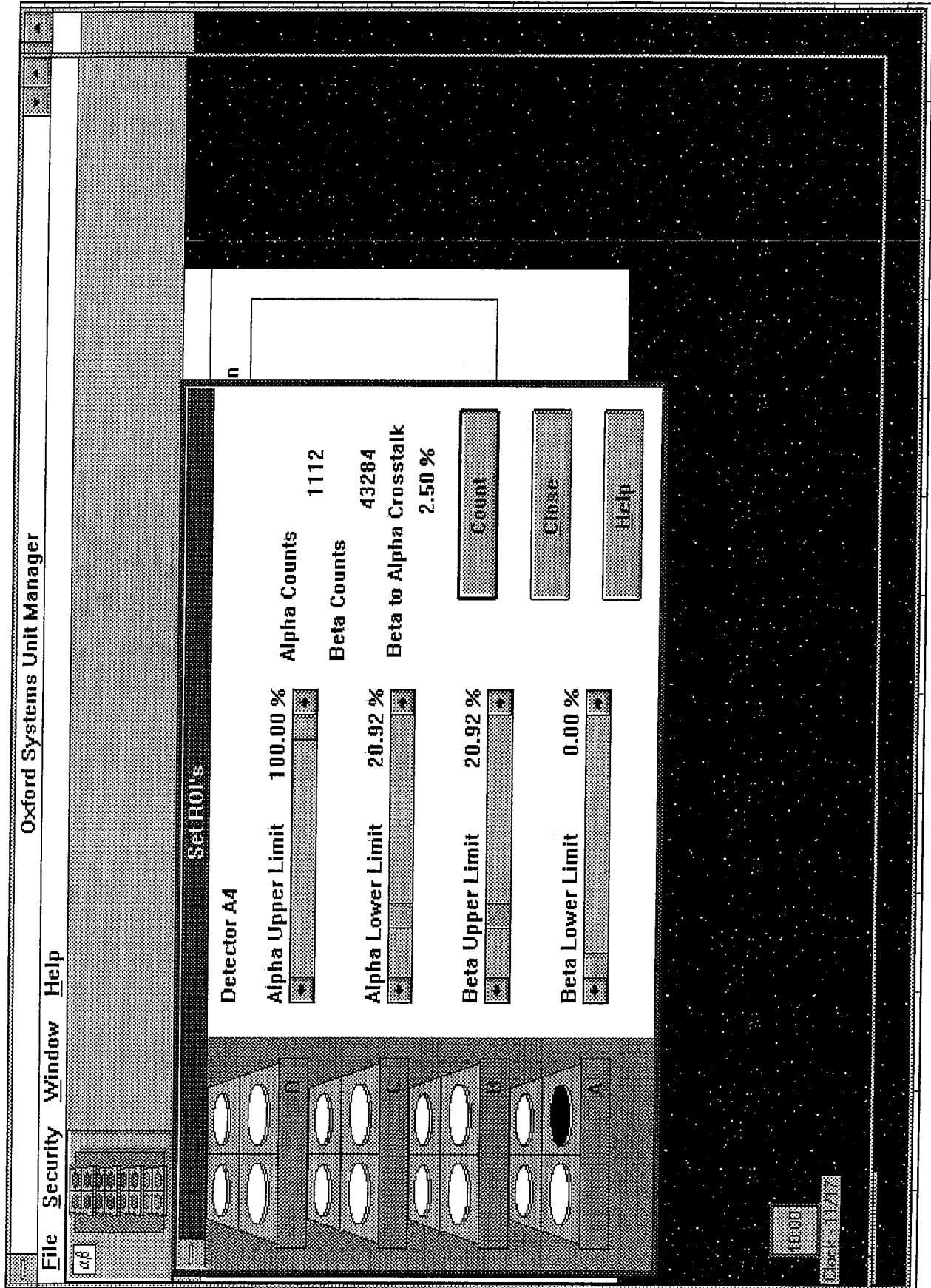


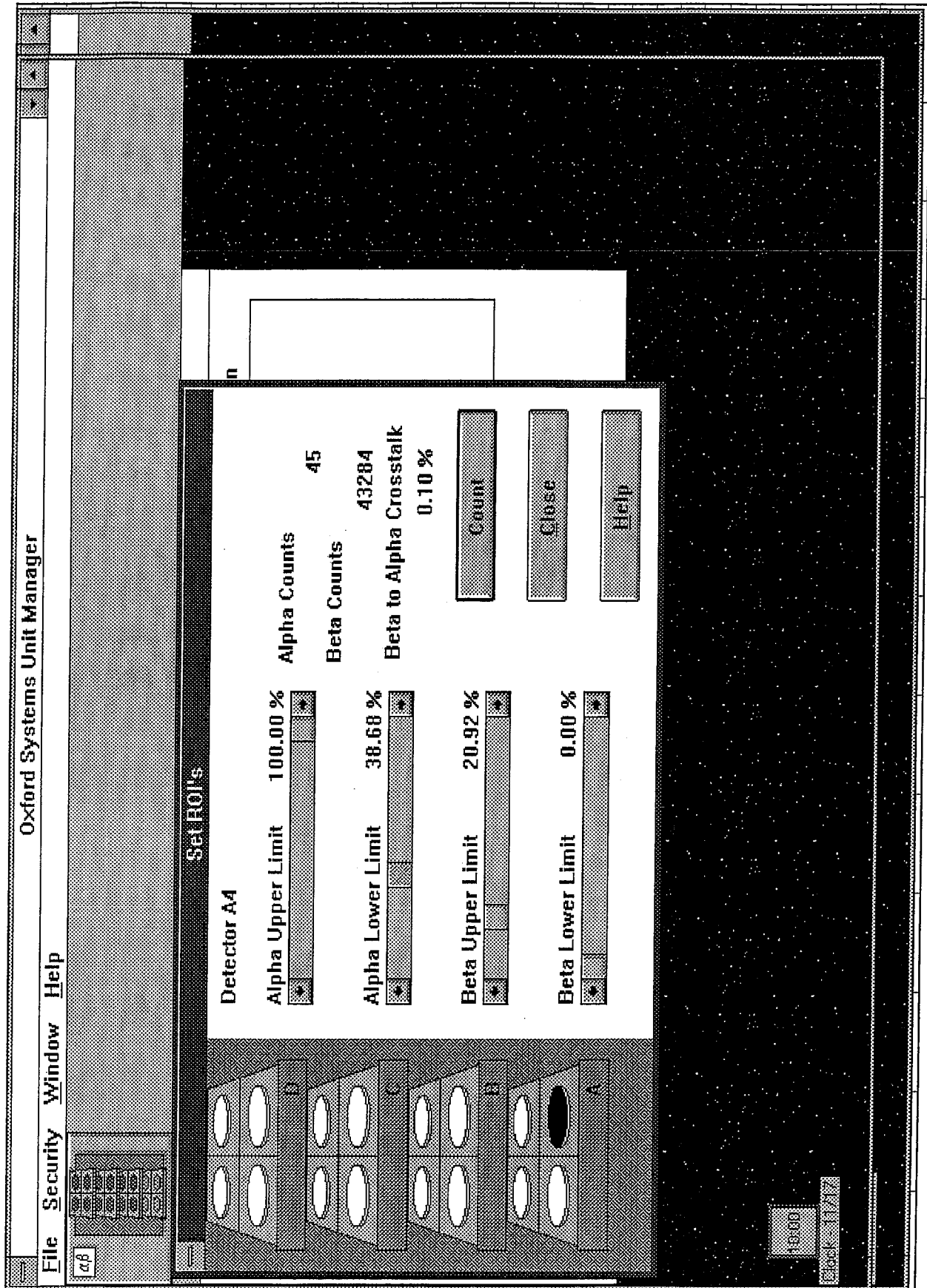


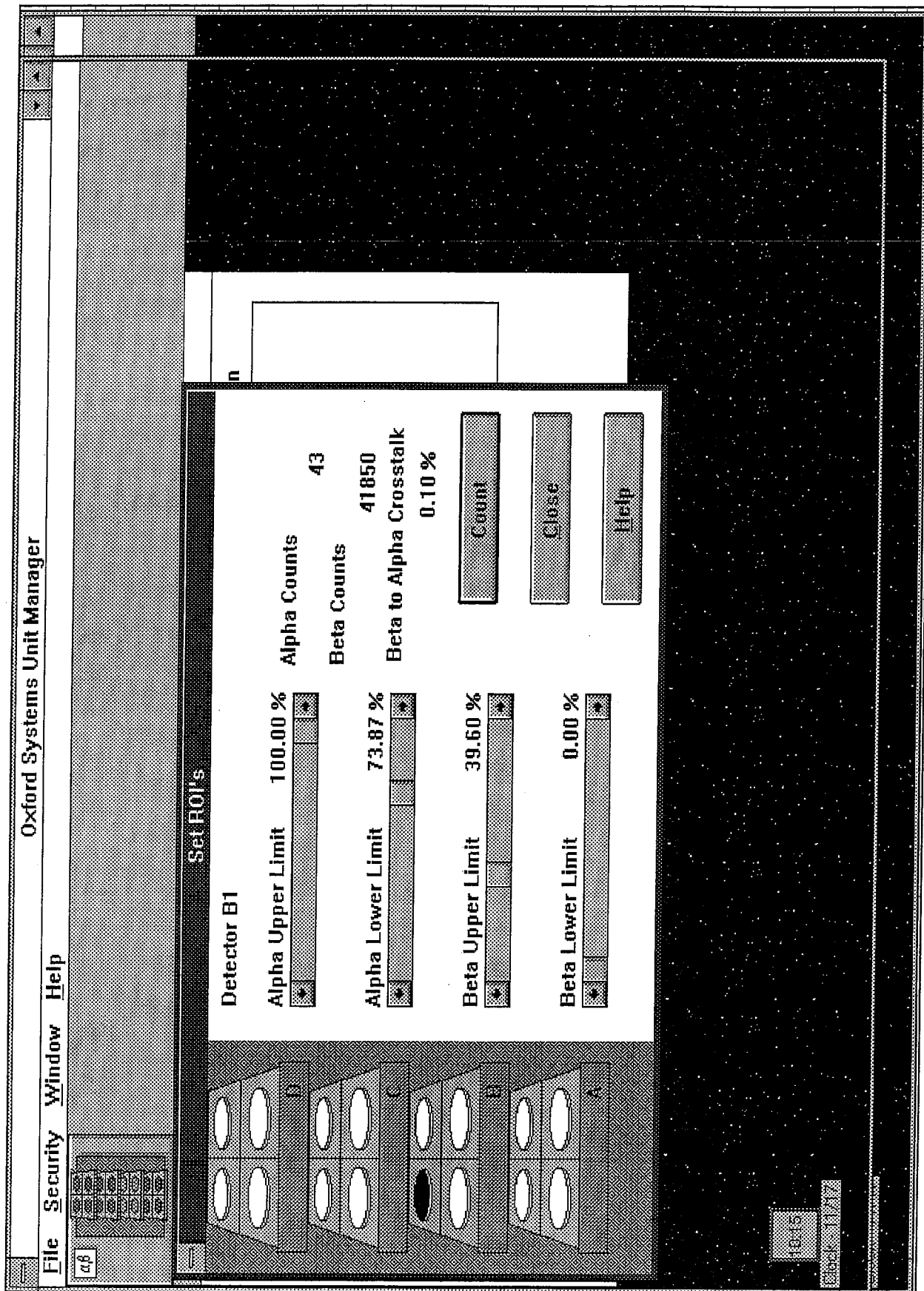




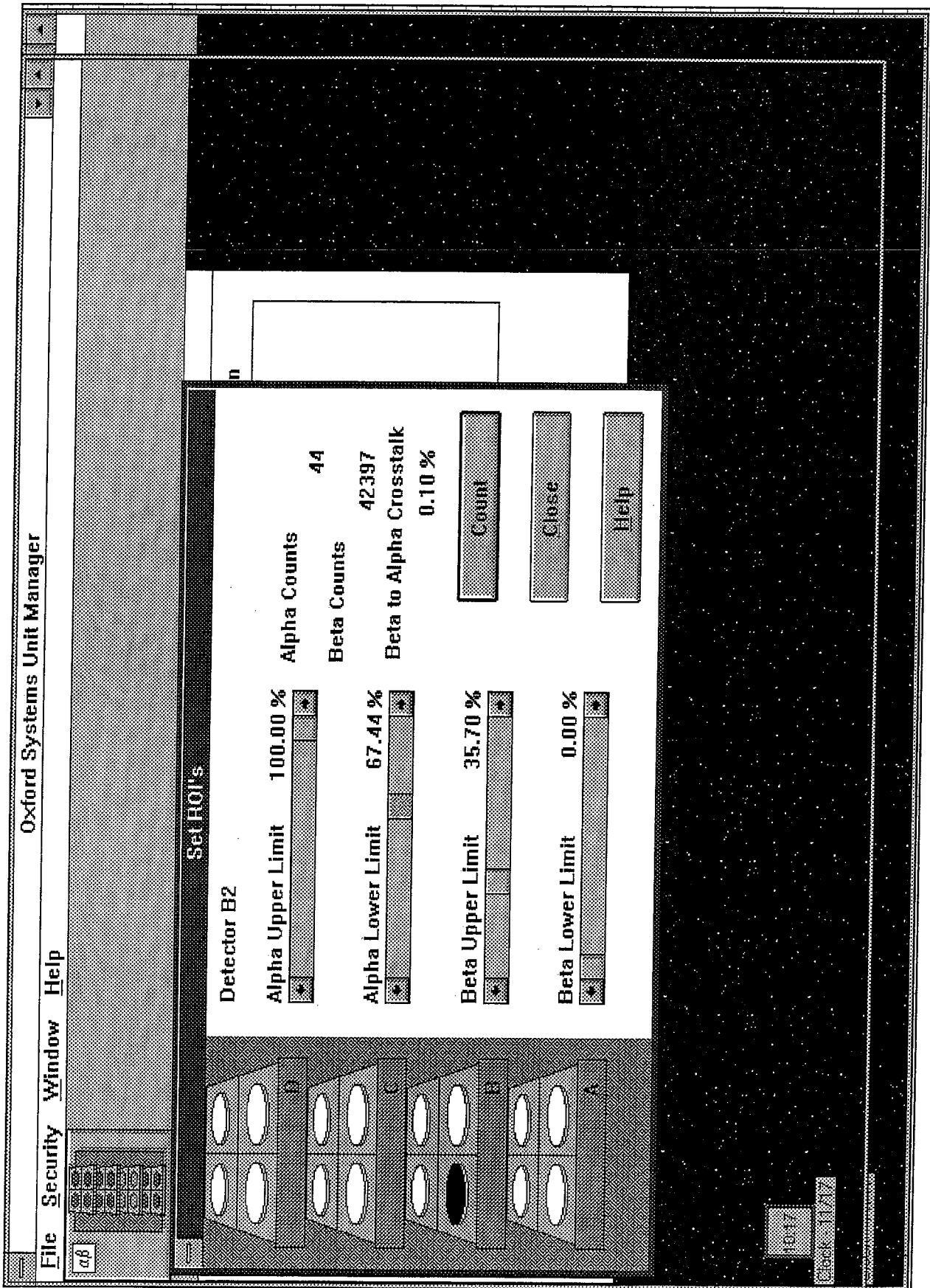


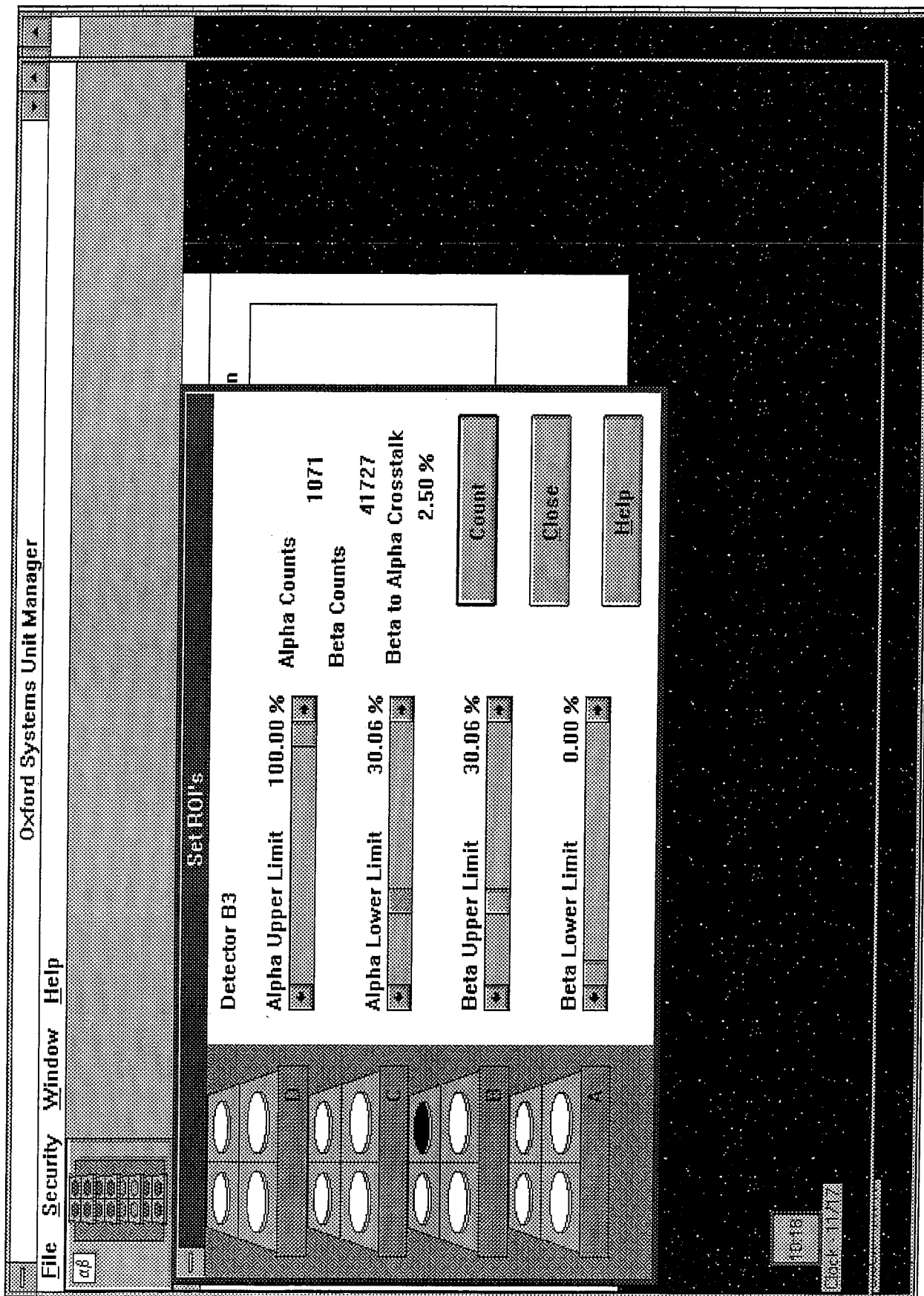


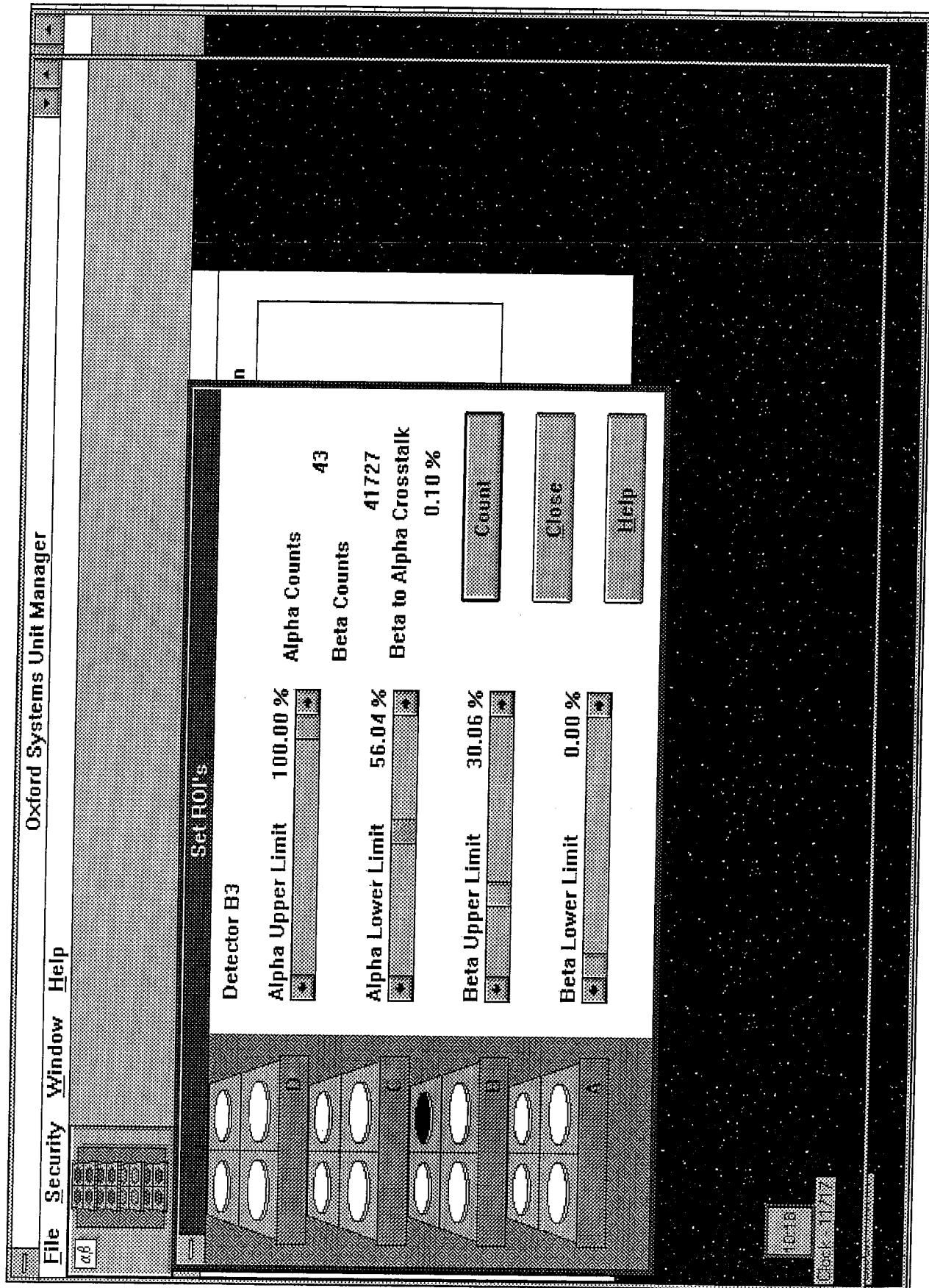


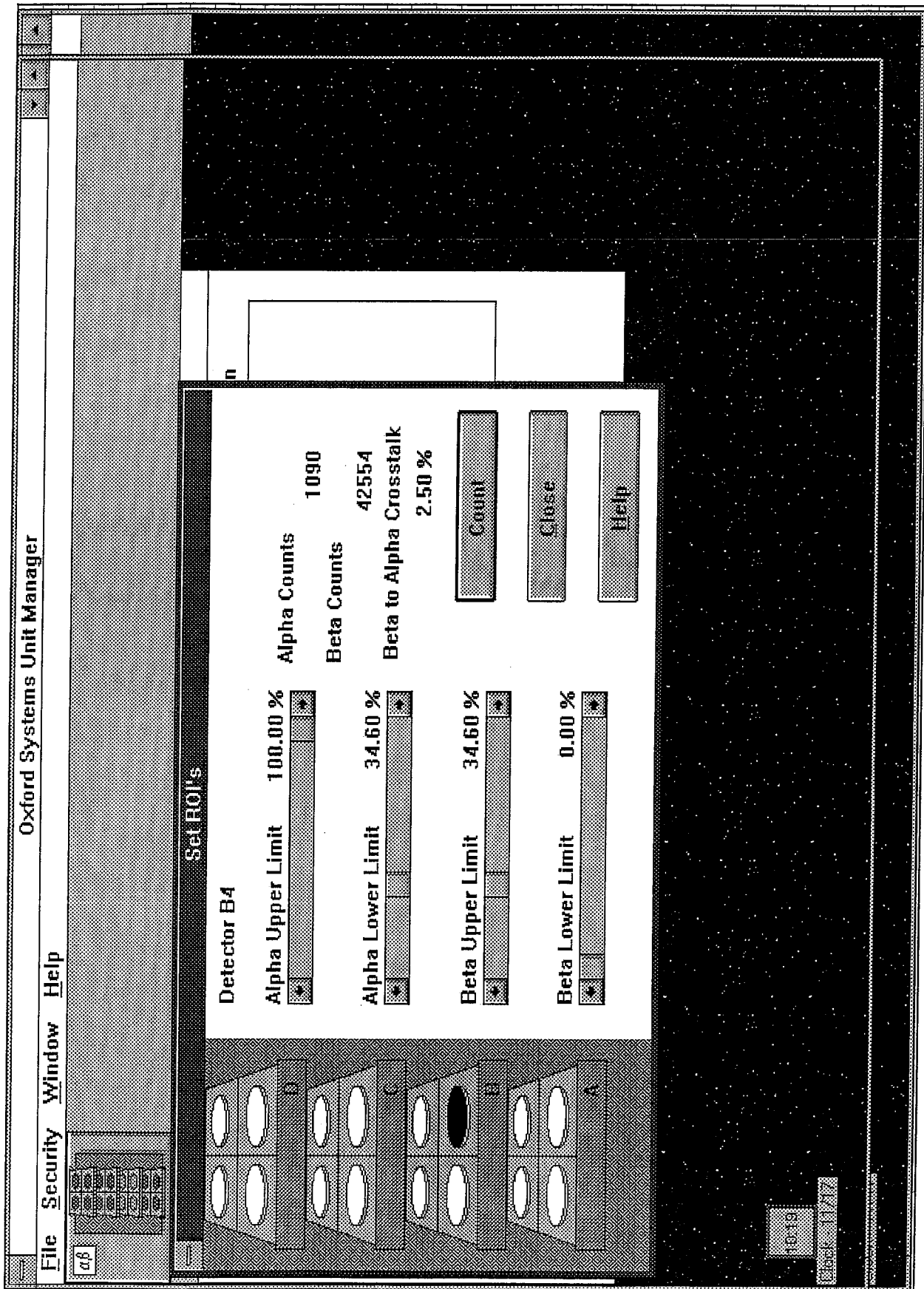


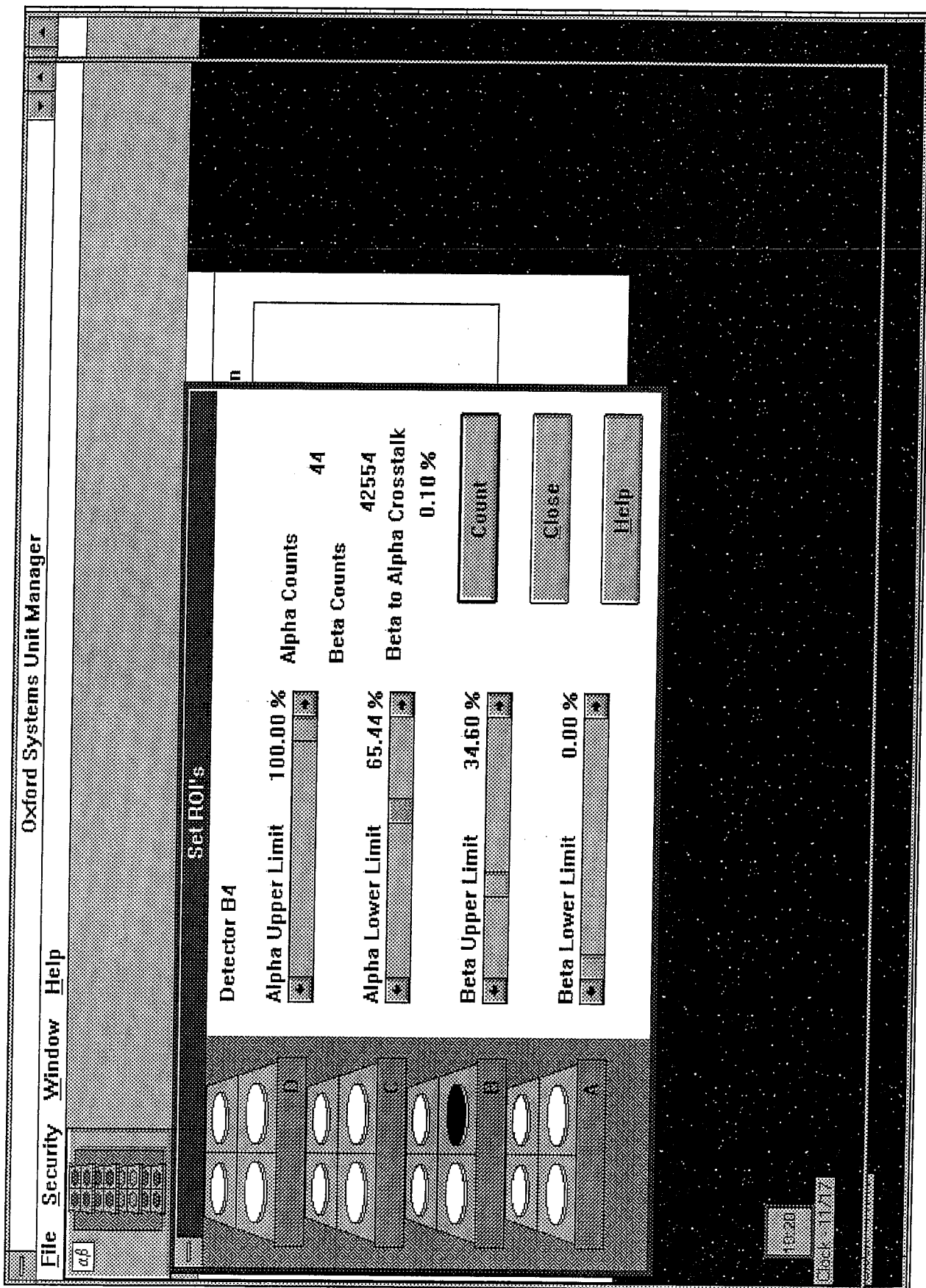
13:16
Track - 11/17

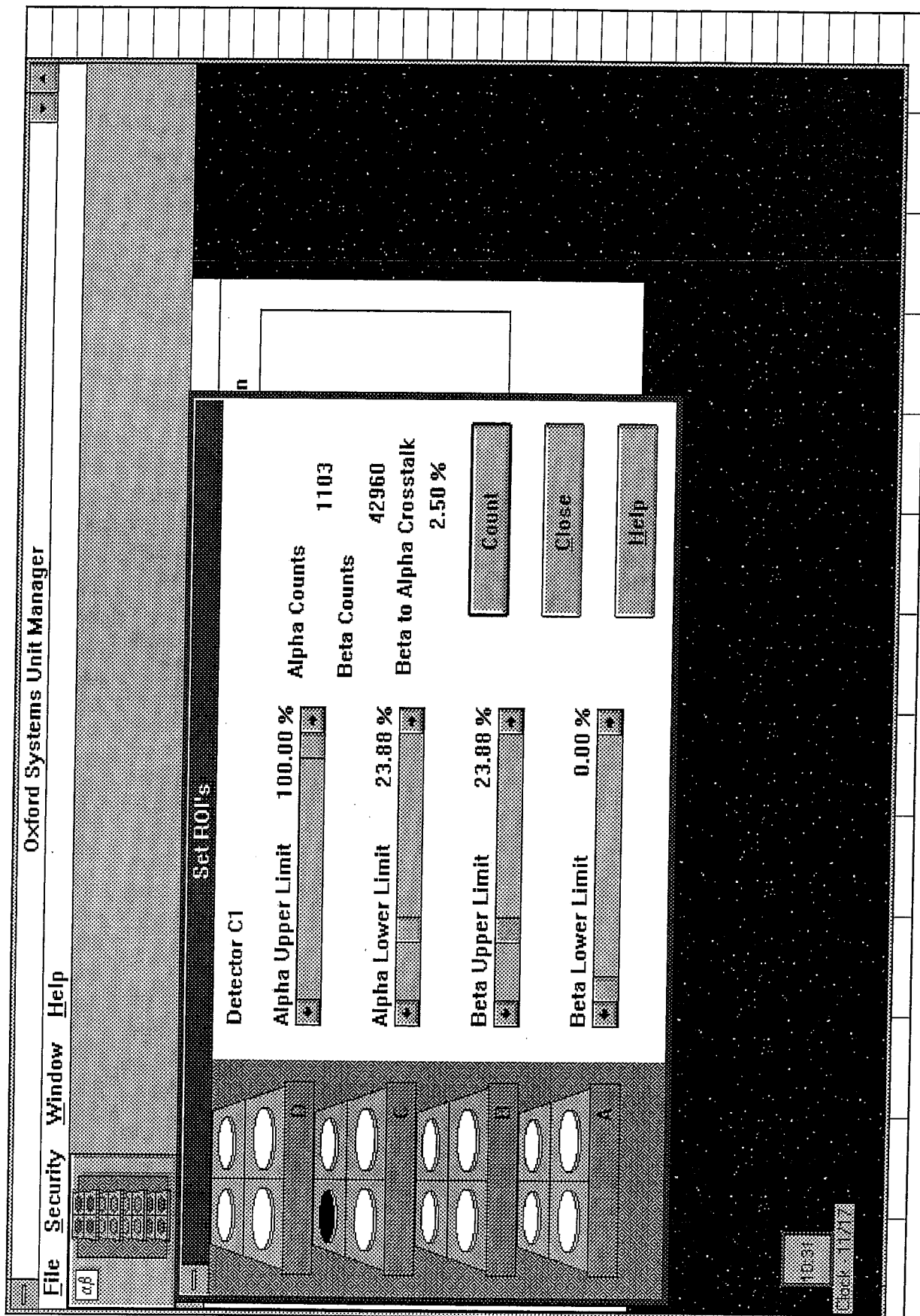












Oxford Systems Unit Manager

File Security Window Help

10.31

Set ROI's

Detector C1

Alpha Upper Limit	Alpha Lower Limit	Beta Upper Limit	Beta Lower Limit
100.00 %	46.69 %	23.88 %	0.00 %

Alpha Counts 45

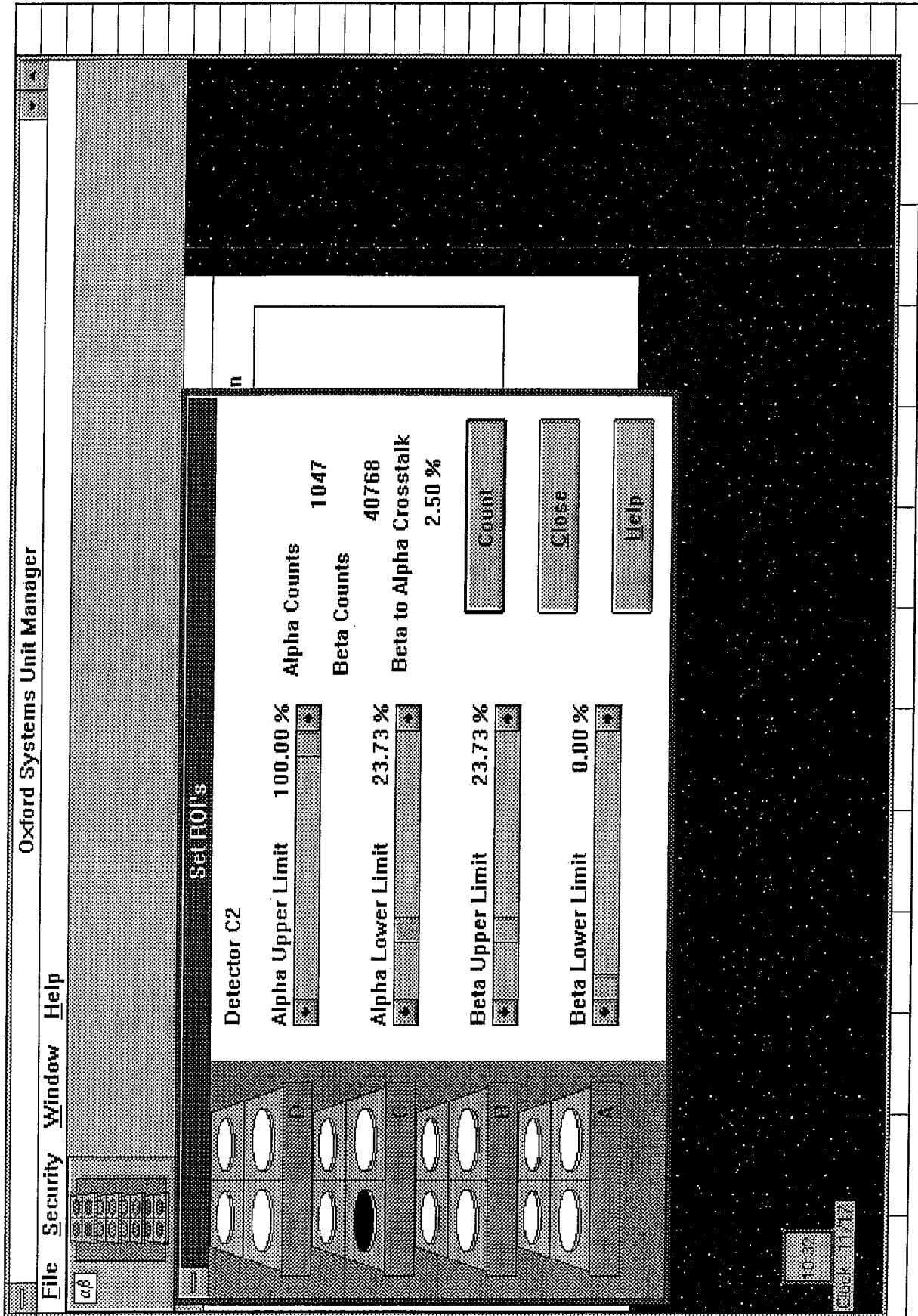
Beta Counts 42960

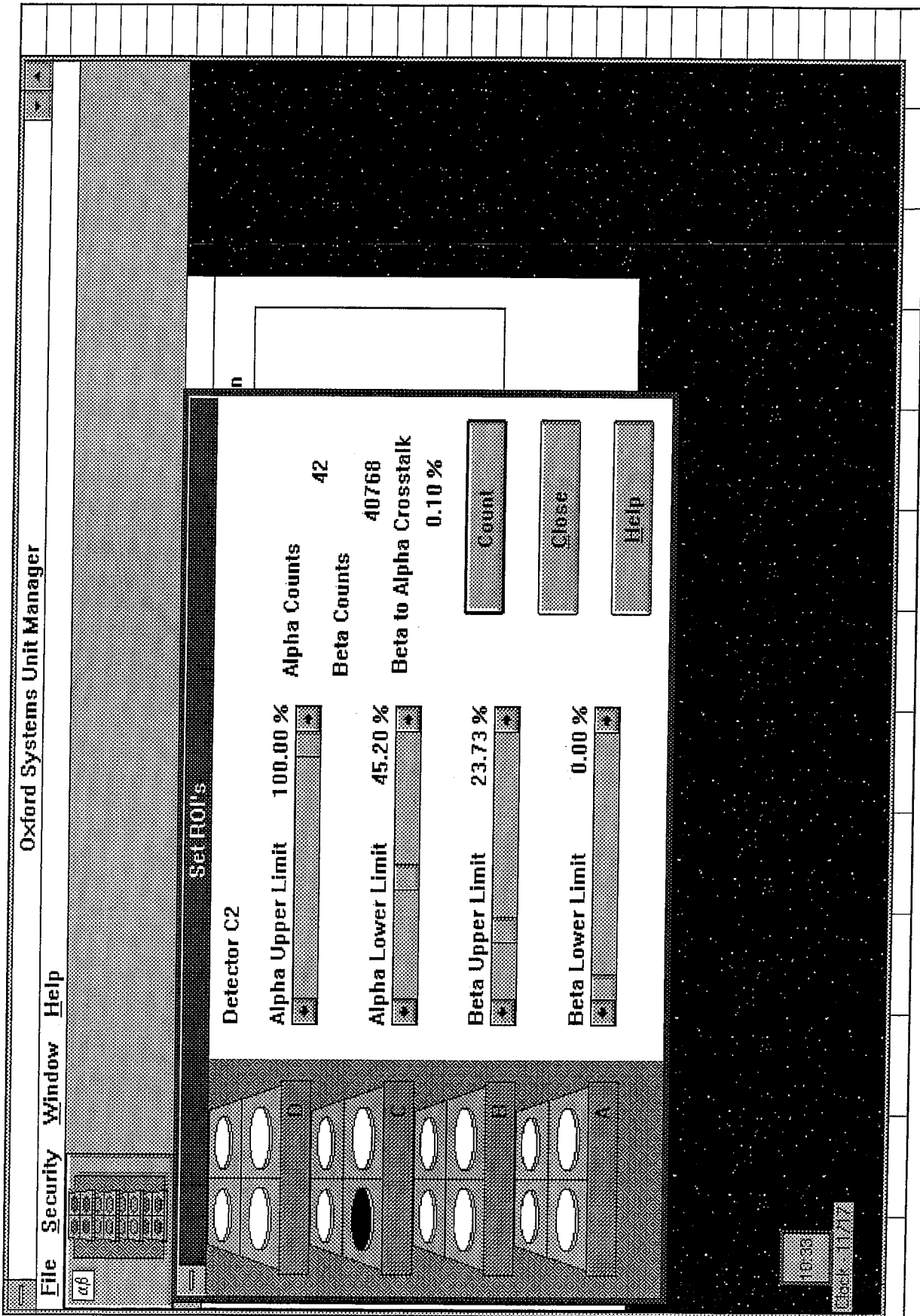
Beta to Alpha Crosstalk 0.10 %

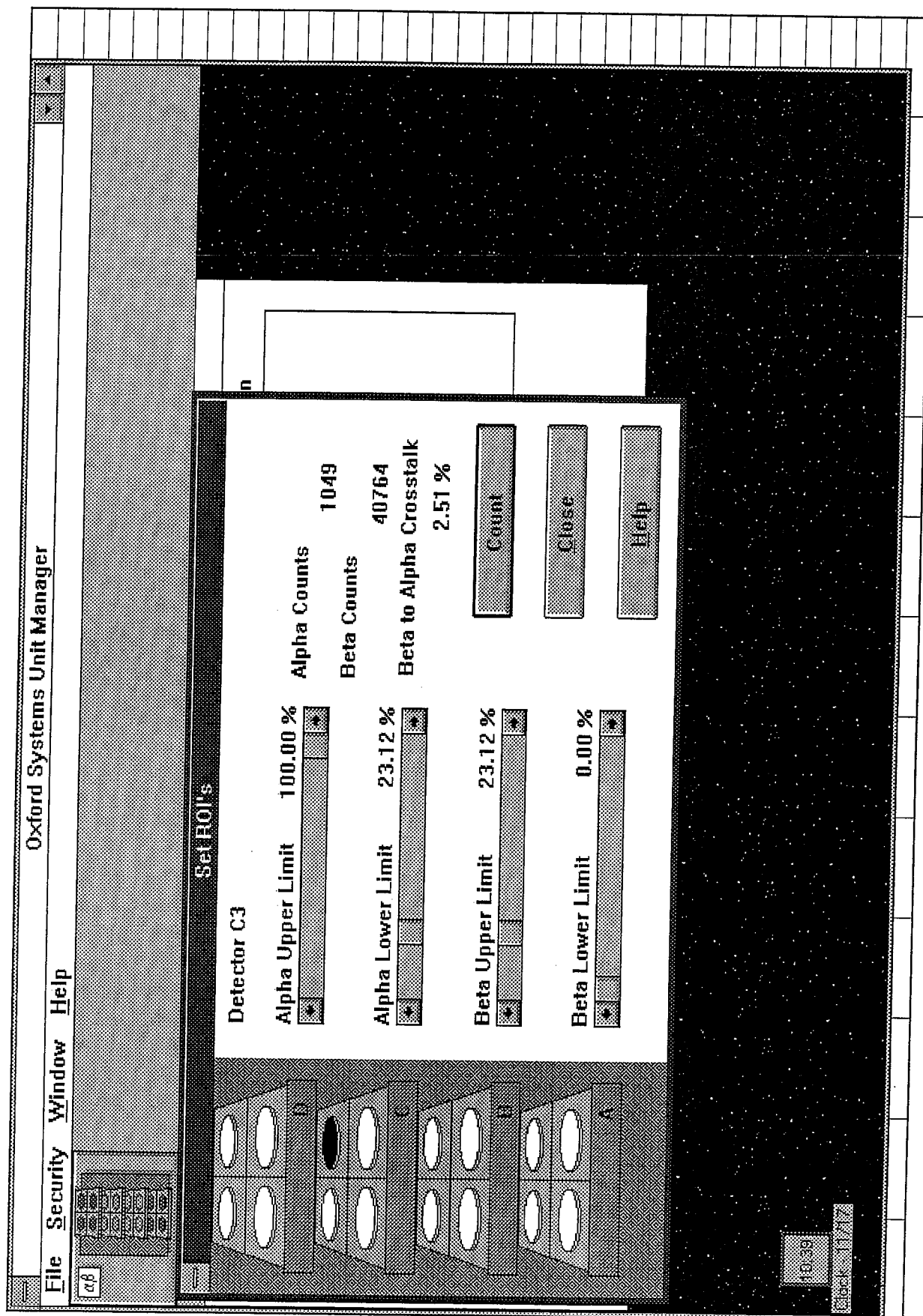
Count Close Help

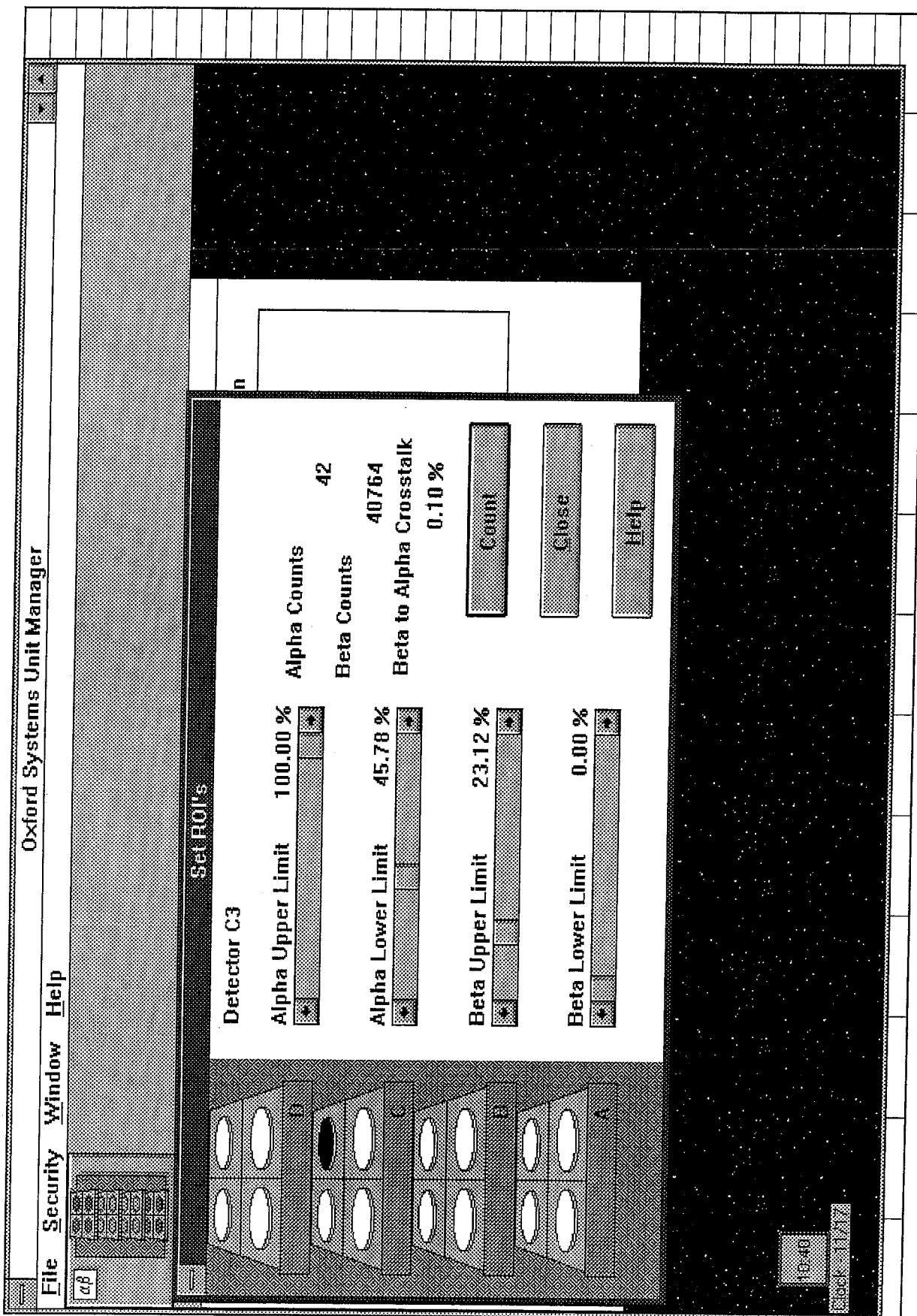
10.31

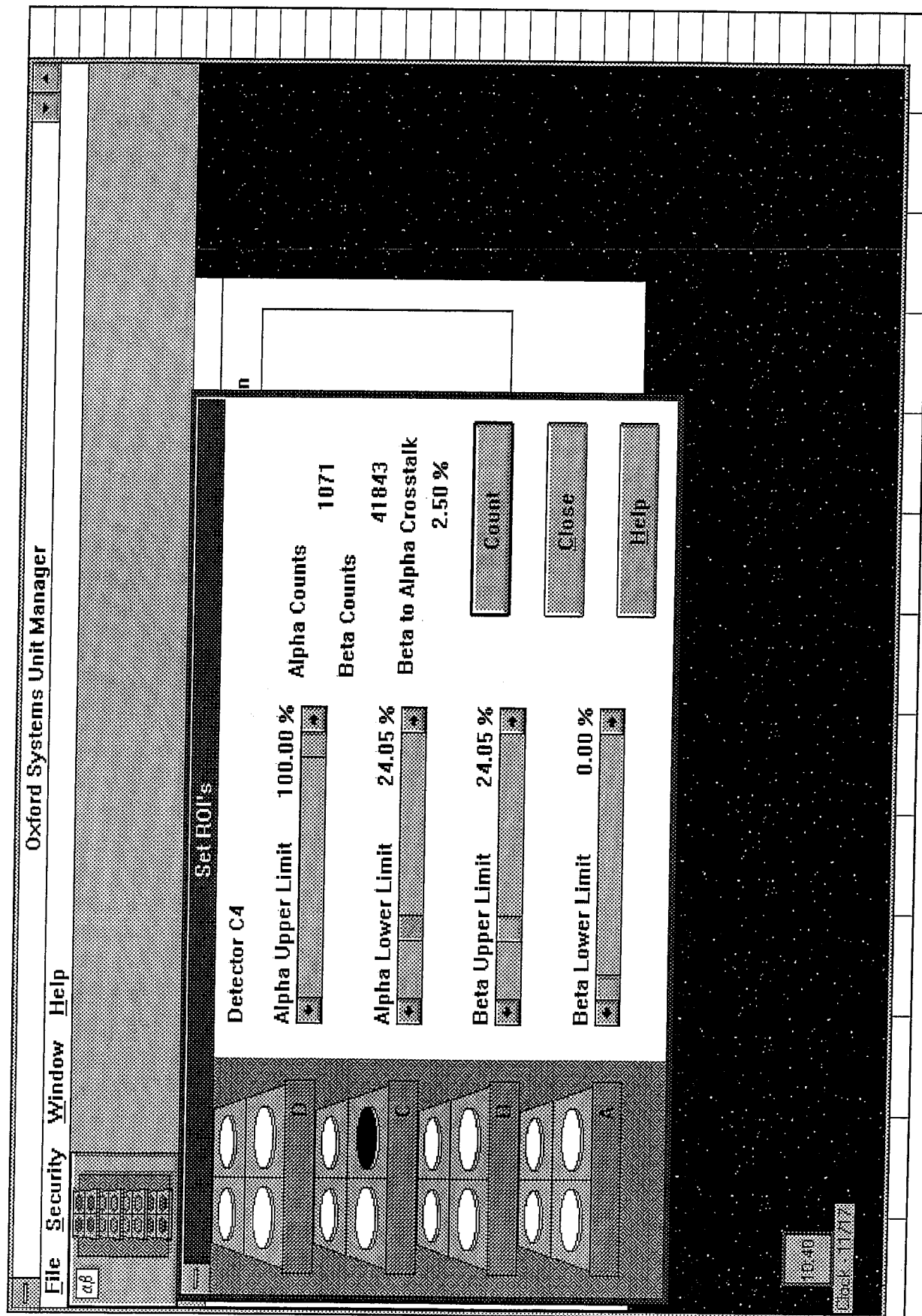
Set ROI's

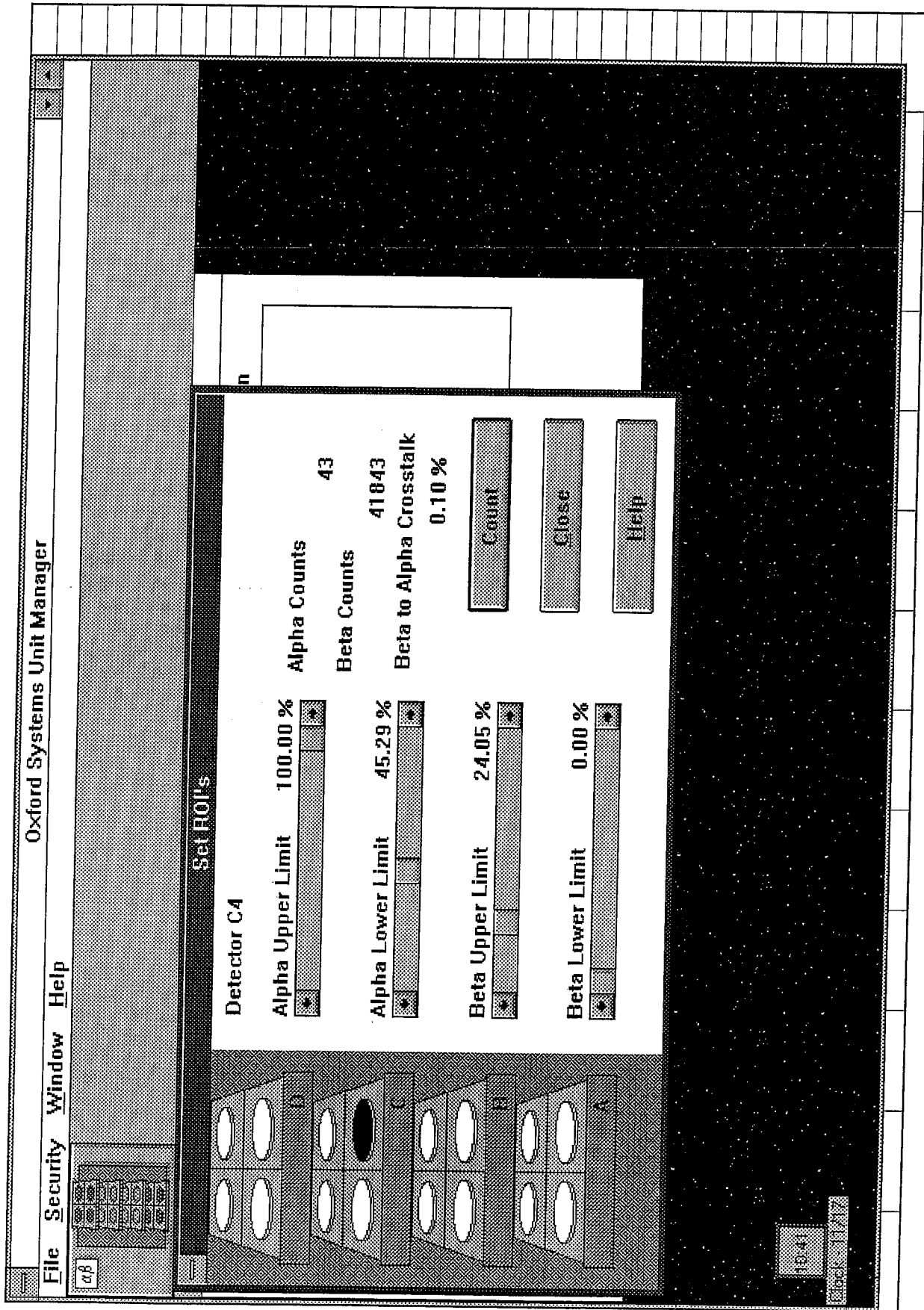


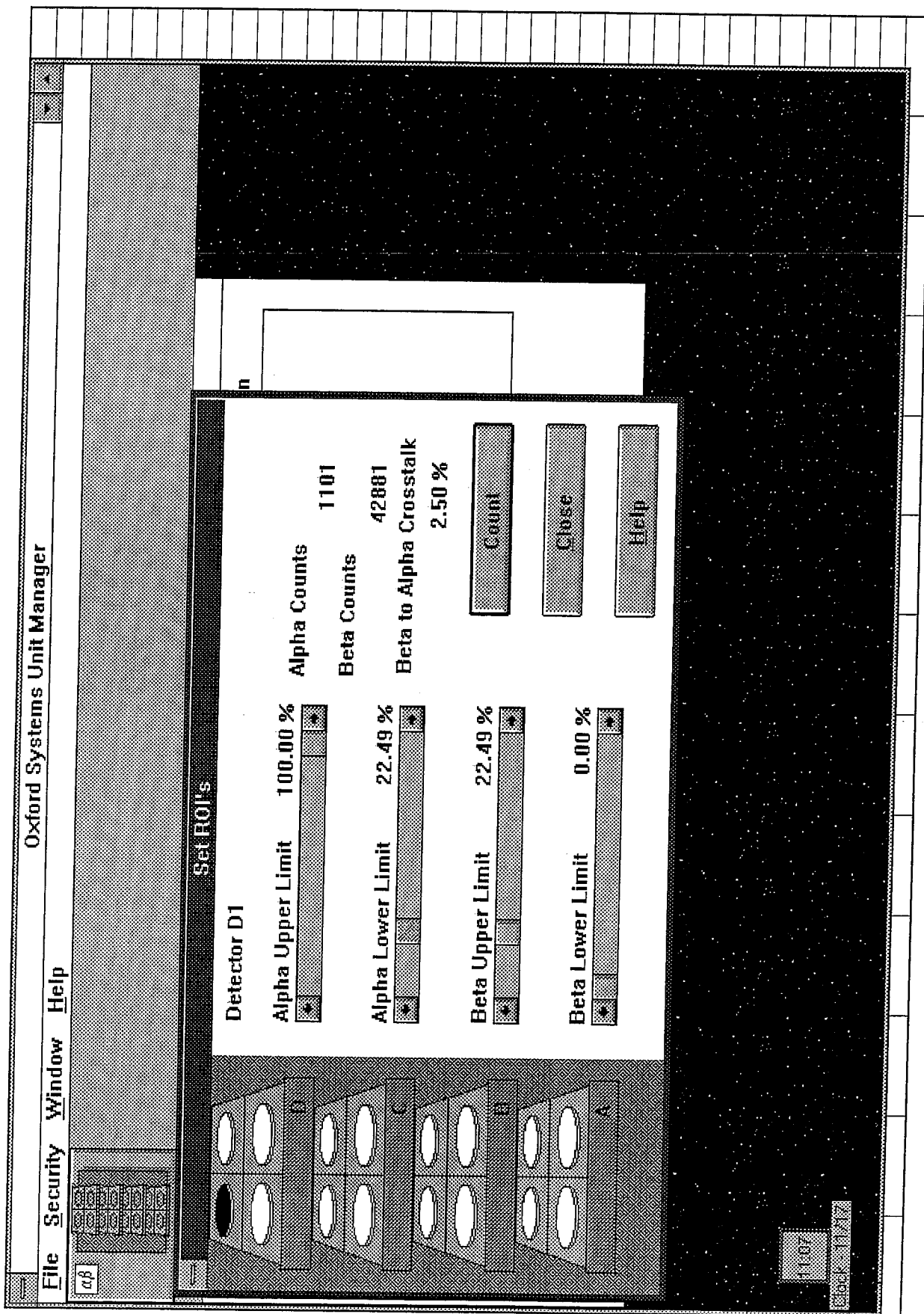


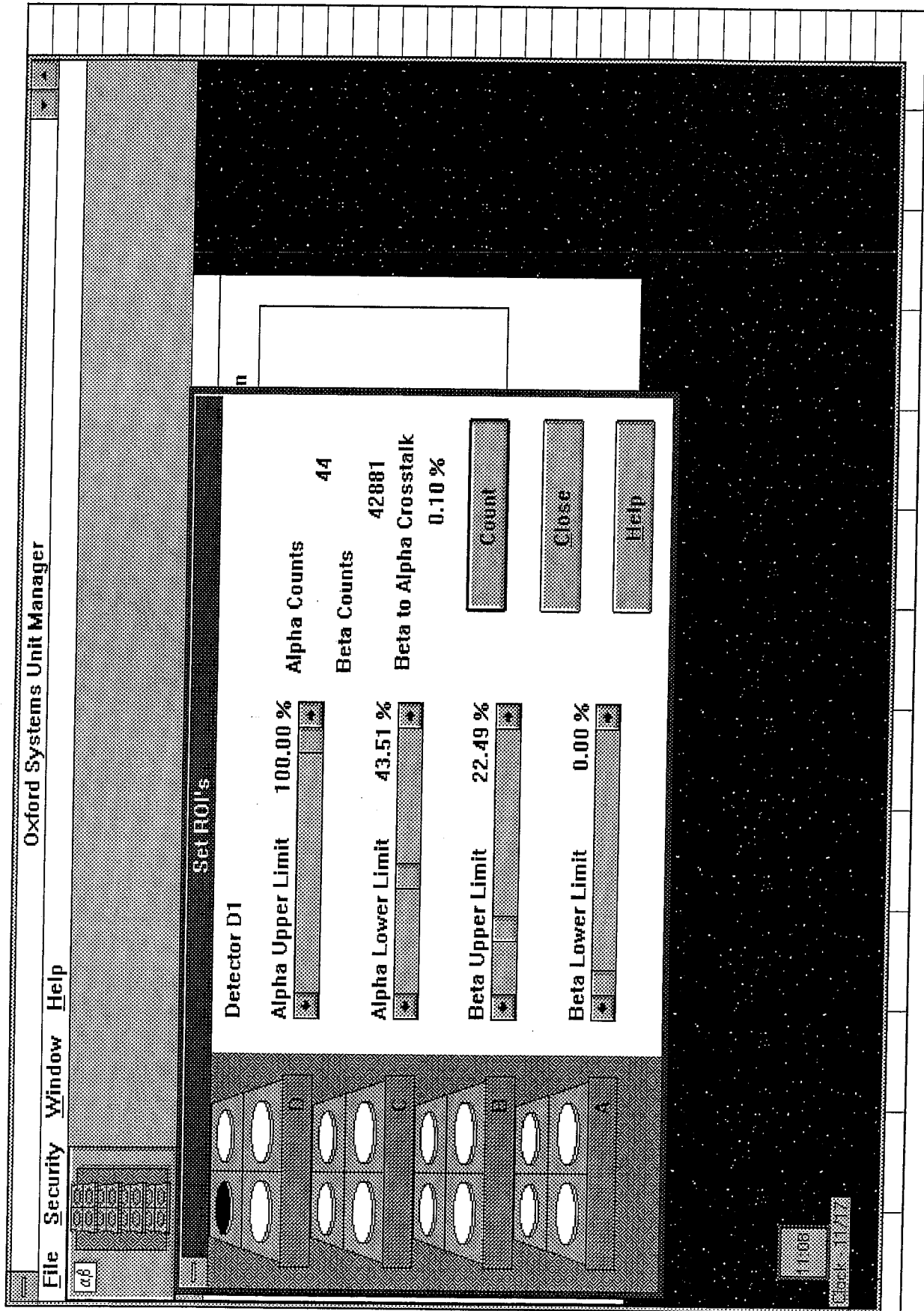


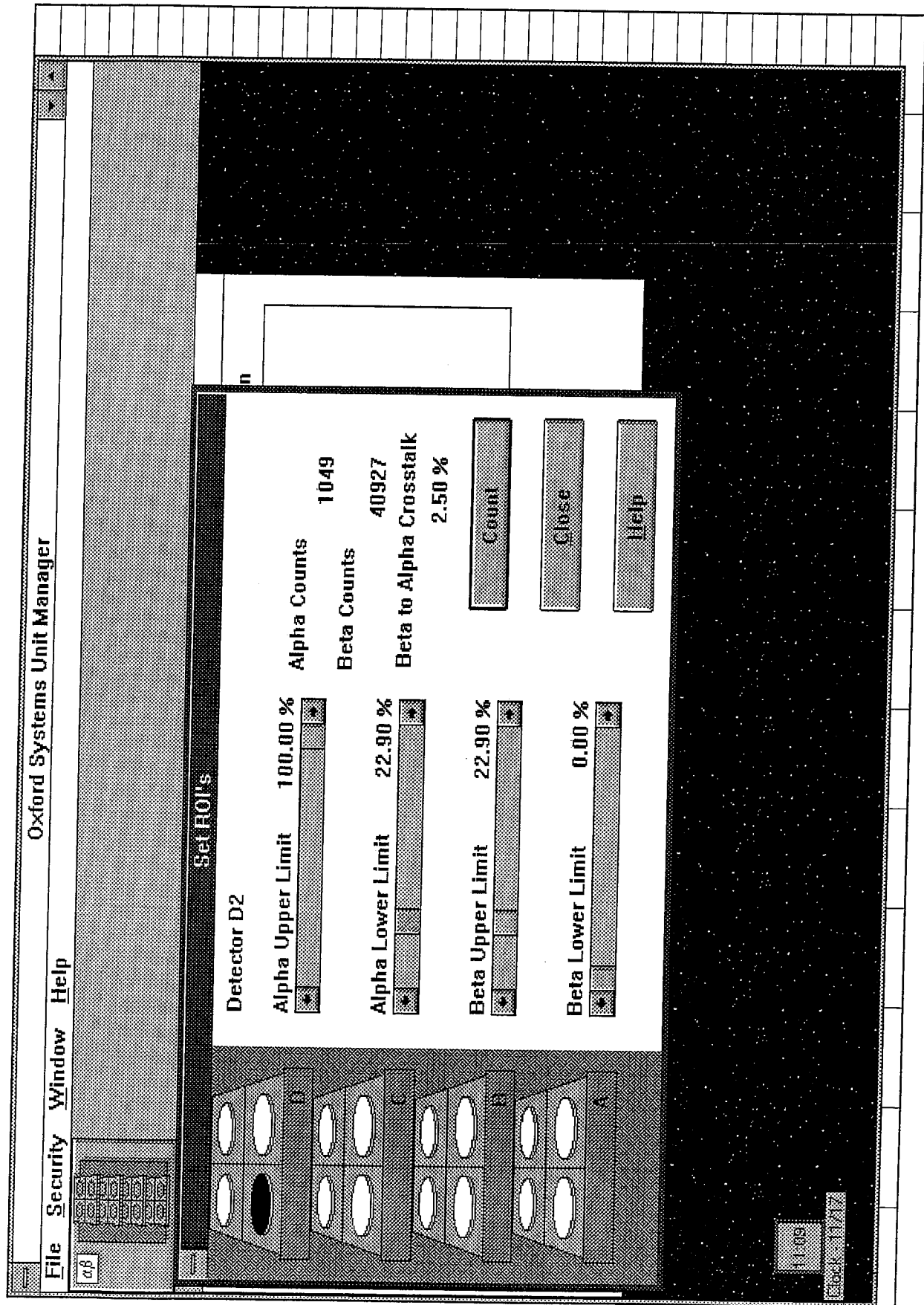


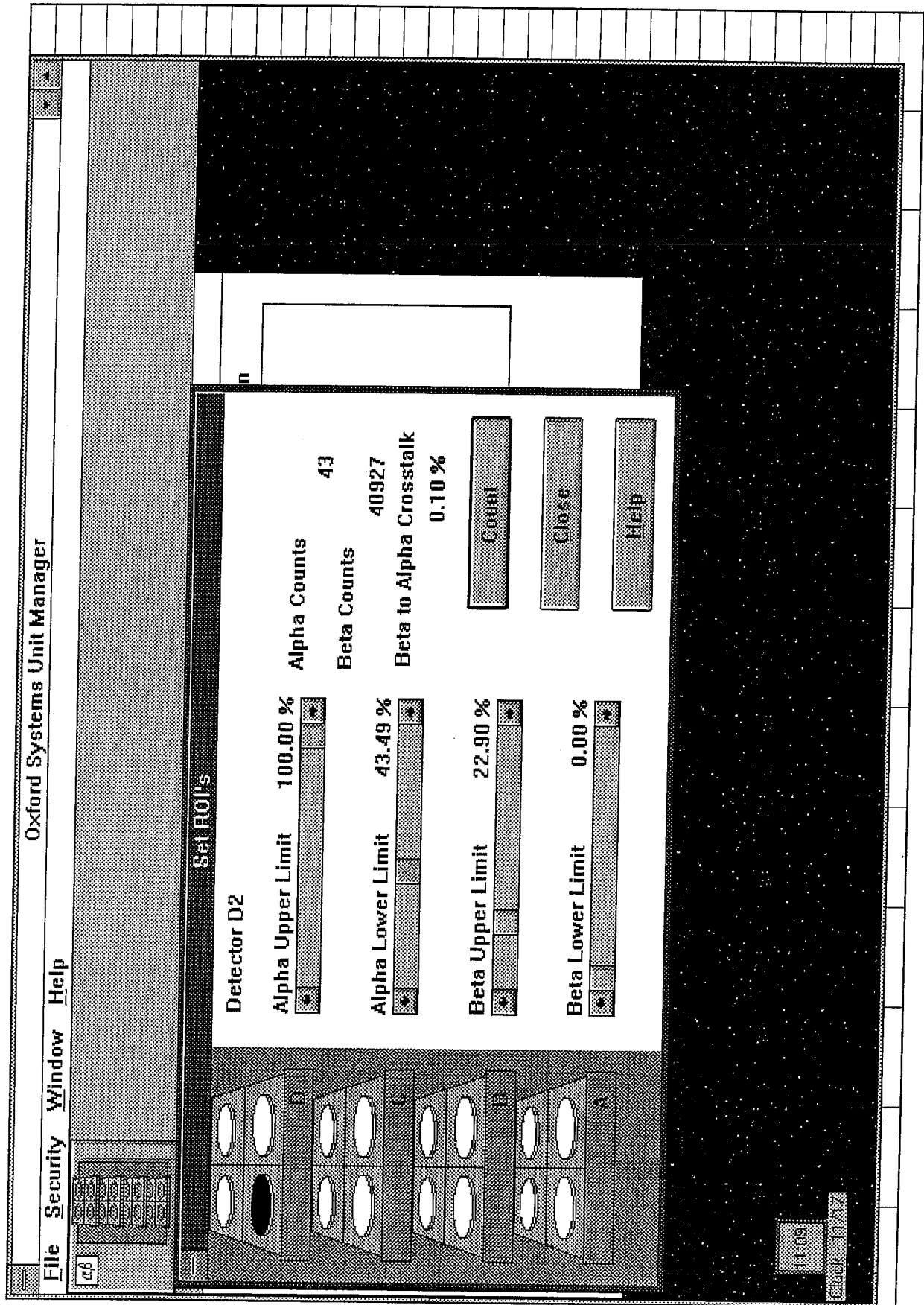


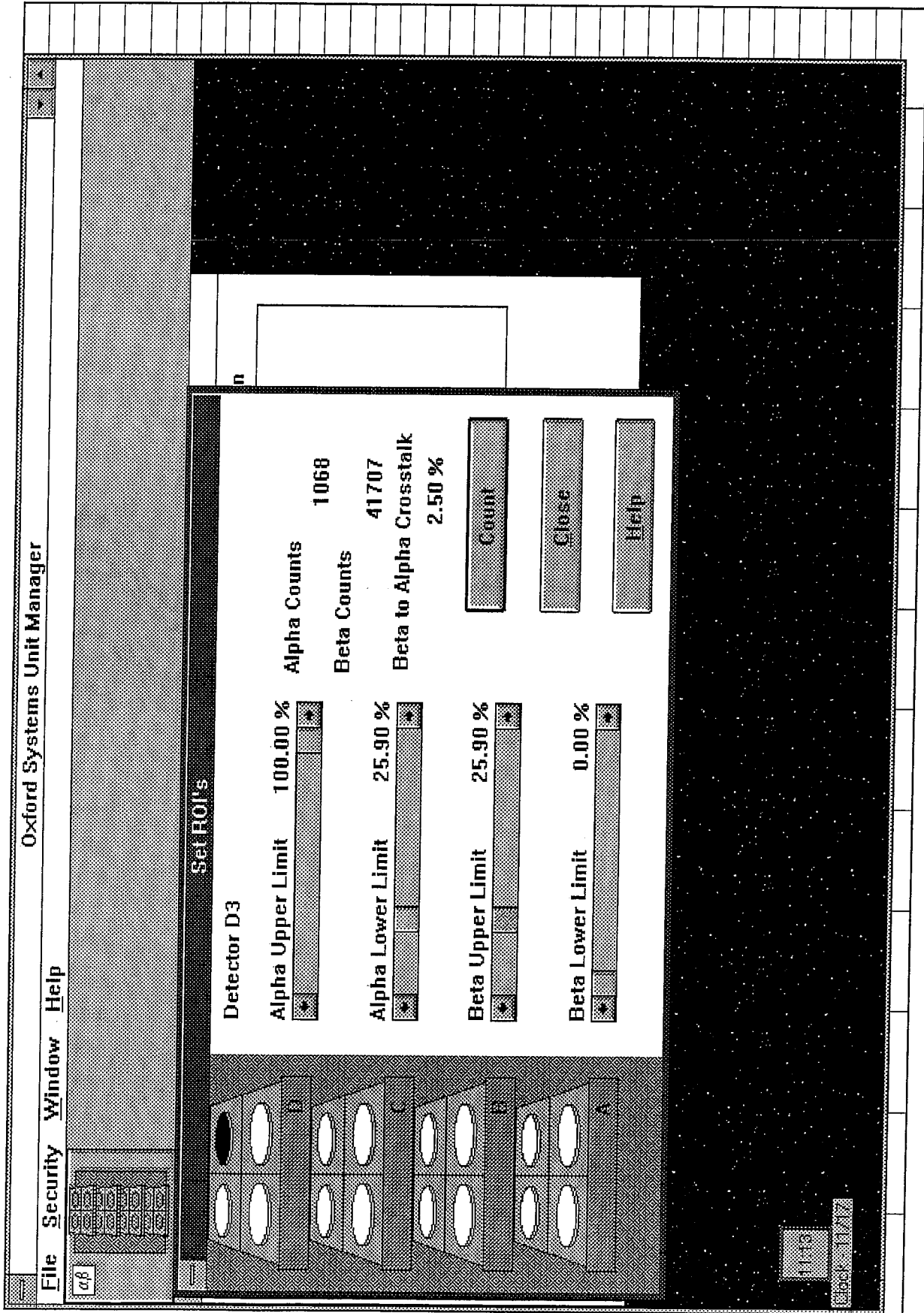


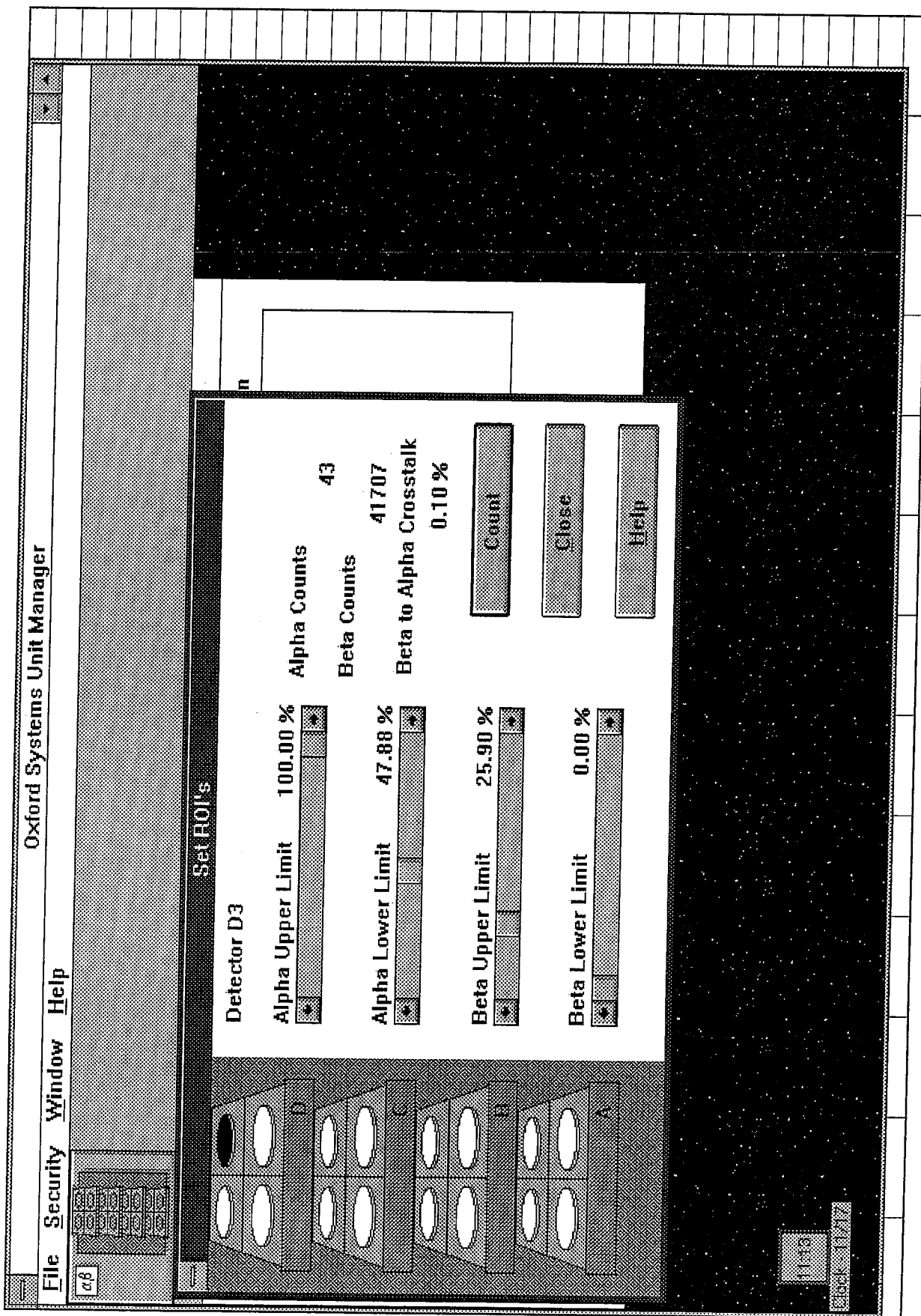












Oxford Systems Unit Manager

File Security Window Help

1114

Block 11/17

Detector D4

Alpha Upper Limit 100.00 %

Alpha Lower Limit 25.17 %

Beta Upper Limit 25.17 %

Beta Lower Limit 0.00 %

Alpha Counts 1155

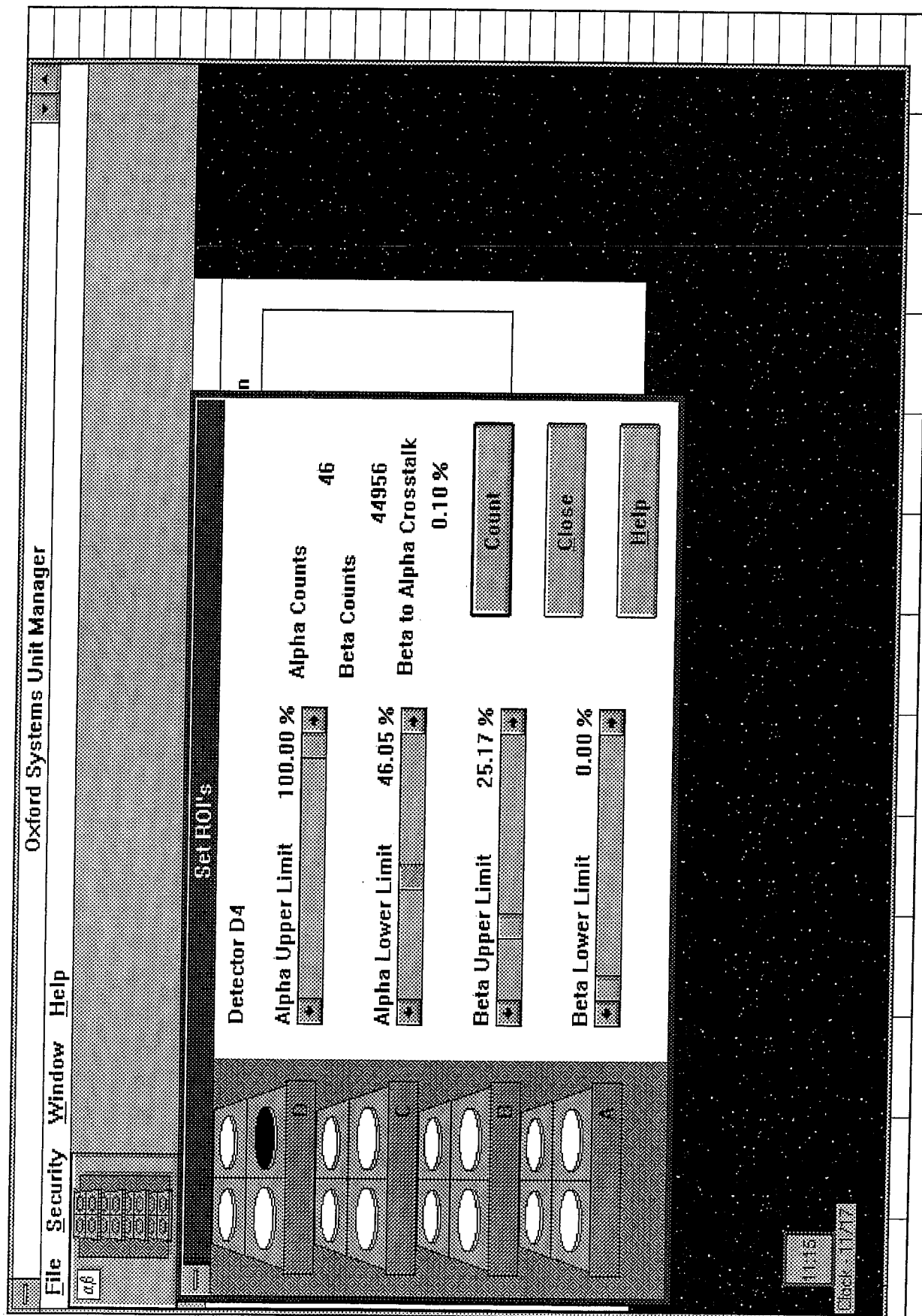
Beta Counts 44956

Beta to Alpha Crosstalk 2.50 %

Count

Close

Help



Calibration Efficiencies

Sr-89 Efficiency Calibration

LB4100-B

Date: 11/18/2008

Source ID: 1186

Det ID File Name	A1 ESE1118C	A2 ESE1118C	A3 ESE1118C	A4 ESE1118C	B1 ESE1118B	B2 ESE1118B	B3 ESE1118B	B4 ESE1118B
Cnt Time	4.35	4.21	4.23	4.31	4.27	4.17	4.3	4.28
Tot Cnts	10027	10034	10027	10013	10032	10025	10024	10036
Bkg CPM	1.384	1.345	1.319	1.509	1.714	1.427	1.479	1.506
CPM	2303.673	2382.028	2369.130	2321.693	2347.701	2402.65	2329.684	2343.354
Alpha Efficiency	0.000669	0.000294	0.000558	0.000718	0.000508	0.000653	0.000458	0.000549
Beta Efficiency	0.426121	0.440614	0.438228	0.429454	0.434227	0.444391	0.430895	0.433423
Efficiency	0.4261	0.4406	0.4382	0.4295	0.4342	0.4444	0.4309	0.4334

Det ID File Name	C1 ESE1118A	C2 ESE1118A	C3 ESE1118A	C4 ESE1118A	D1 ESE1118	D2 ESE1118	D3 ESE1118	D4 ESE1118
Cnt Time	4.22	4.19	4.36	4.36	4.29	4.13	4.23	4.28
Tot Cnts	10016	10006	10032	10012	10020	10020	10007	10026
Bkg CPM	1.601	1.526	5.442	1.520	1.645	1.598	1.547	2.538
CPM	2371.859	2386.541	2295.475	2294.810	2334.019	2424.552	2364.174	2339.985
Alpha Efficiency	0.000467	0.000647	0.000618	0.000876	0.000627	0.000479	0.000561	0.000679
Beta Efficiency	0.438638	0.441354	0.424513	0.424390	0.43161	0.448352	0.437187	0.432714
Efficiency	0.4386	0.4414	0.4245	0.4244	0.4316	0.4484	0.4372	0.4327

Sr-89/Ra-228 Efficiency

LB4100-B

11/18/2008

	Efficiency 2007	Efficiency 2008	% Diff
Det #			
A1	0.4435	0.4261	3.92
A2	0.4344	0.4406	1.43
A3	0.4488	0.4382	2.36
A4	0.4411	0.4295	2.63
B1	0.4472	0.4342	2.91
B2	0.4393	0.4444	1.16
B3	0.4309	0.4309	0.00
B4	0.4449	0.4334	2.58
C1	0.438	0.4386	0.14
C2	0.4325	0.4414	2.06
C3	0.4246	0.4245	0.02
C4	0.4205	0.4244	0.93
D1	0.4319	0.4316	0.07
D2	0.4445	0.4484	0.88
D3	0.4279	0.4372	2.17
D4	0.4432	0.4327	2.37

Source Database for OSUM for LB4100-B

Number of sources in table: 108

Application Revision: A

Control ID	Isotope	Type	Half-Life (days)	DPM	Std dev	Date	Status	Alpha/Beta Archive File
1181	Am-241	Alpha	157856.73	9342	467.10	6-Apr-04	PA	AmWipe-11/08
1182	Sr-90/Y-90	Beta	10518.912	37044	1852.20	10-Dec-01	PA	Sr90Wipe-11/08
1183	AM-241	Alpha	157856.73	5514.295	275.71	6-Jun-01	PA	Am241-11/08
1184	Sr-90/Y-90	Beta	10518.912	19986.92	999.35	2-Dec-04	PA	Sr90R-11/08
1185	Sr-90/Y-90	Beta	10518.912	1110	55.50	18-Mar-99	PA	Sr90F-11/08
1186	Sr-89	Beta	50.53	10512.56	525.63	1-Oct-08	PA	Sr89-11/08
1187	Sr-89	Beta	50.53	1599.916	80.00	20-Nov-08	PA	Ra228-11/08

11/18/08 Sr90 Calibration - Flat Planchet TH 11/18/08

Benchsheet: 279055A Source ID: 1185 Logfile: Sr90F-11/08

Sources	Detectors	File names
0424028-S1	A1 B1 C1 D1	ESF1118
↓ -S2	A2 B2 C2 D2	ESF1118A
↓ -S3	A3 B3 C3 D3	ESF1118B
↓ -S4	A4 B4 C4 D4	ESF1118C

11/18/08 Sr89/Ra228 Calibration - Flat Planchet

Benchsheet: RA081001-Z Source ID: 1186 Logfile: Sr89-11/08

Sources	Detectors	File names
0822001-1	A1 B1 C1 D1	ESE1118
↓ -2	A2 B2 C2 D2	ESF1118A
↓ -4	A3 B3 C3 D3	ESE1118B
↓ -5	A4 B4 C4 D4	ESE1118C

11/18/08 Am241 Calibration (Gross Alpha) - Ringed Planchet

Benchsheet: 290486A Source ID: 1183 Logfile: Am241-11/08

Sources	Detectors	File names
0615044-S2	A1 B1 C1 D1	EAM1118
↓ -S3	A2 B2 C2 D2	EAM1118A
↓ -S4	A3 B3 C3 D3	EAM1118B
↓ -S5	A4 B4 C4 D4	EAM1118C

11/18/08 Sr90 Calibration (Gross Beta) - Ringed Planchet

Benchsheet: 290476A Source ID: 1184 Logfile: Sr90R-11/08

Sources	Detectors	File names
0614030-S1 ^{JP}	A1 A B1 C1 D1	ESR1118
↓ -S2	A2 B2 C2 D2	ESR1118A
↓ -S3	A3 B3 C3 D3	ESR1118B
↓ S4	A4 B4 C4 D4	ESR1118C

Continued on Page

Signed

11/19/08

Date

Read and Understood By

Signed

11/19/08

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Date 11/18/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: **LB4100B**

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P*			Δ				P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKBI117W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	1100	Dr A	0.15
	↓	Dr B	↓
Tank 2	550	Dr C	
	↓	Dr D	↓

Comments:

* Interim Control Limits established ($\pm 10\%$ of EFB1118 Valve)
 Δ It is not necessary to run daily background checks on the morning following a weekly background calibration.

Date 11/18/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100B

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	1181	Am Wipe EFF	2	30	8:25	JP	EFB1118	JP
1				30	9:02	JP	EAW1118	JP
2					9:10	JP	EAW1118A	JP
3					9:18	JP	EAW1118B	JP
4					9:26	JP	EAW1118C	JP
5					9:39	JP	EAW1118D	JP
6					9:44	JP	EAW1118E	JP
7					9:50	JP	EAW1118F	JP
8					9:56	JP	EAW1118G	JP
9					10:02	JP	EAW1118H	JP
10					10:10	JP	EAW1118I	JP
11					10:16	JP	EAW1118J	JP
12					10:22	JP	EAW1118K	JP
13					10:32	JP	EAW1118L	JP
14					10:39	JP	EAW1118M	JP
15					10:46	JP	EAW1118N	JP
16					10:51	JP	EAW1118O	JP
16	1182	Sr Wipe EFF	B	30	9:02	JP	ESW1118	JP
15					9:10	JP	ESW1118A	JP
14					9:18	JP	ESW1118B	JP
13					9:26	JP	ESW1118C	JP
12					9:39	JP	ESW1118D	JP
11					9:44	JP	ESW1118E	JP
10					9:50	JP	ESW1118F	JP
9					9:56	JP	ESW1118G	JP
8					10:02	JP	ESW1118H	JP
7					10:10	JP	ESW1118I	JP
6					10:16	JP	ESW1118J	JP
5					10:22	JP	ESW1118K	JP
4					10:32	JP	ESW1118L	JP
3					10:39	JP	ESW1118M	JP
2					10:46	JP	ESW1118N	JP
1					10:51	JP	ESW1118O	JP
1-4	1185	Sr 90F EFF	B	30	10:57	JP	ESF1118	JP
5-8					11:27	JP	ESF1118A	JP
9-12					12:06*	JP	ESF1118B	JP
13-16					13:12	JP	ESF1118C	JP
13-16	1186	Sr 89 EFF	B	30	10:57	JP	ESE1118	JP
9-12					11:04	JP	ESE1118A	JP
5-8					11:18	JP	ESE1118B	JP
1-4					11:27	JP	ESE1118C	JP
1-4	1183	Am 241 EFF	2	30	13:45	JP	EAM1118	JP
5-8					13:56	JP	EAM1118A	JP
9-12					14:05	JP	EAM1118B	JP
13-16					14:14	JP	EAM1118C	JP
13-16	1184	Sr 90R EFF	B	30	13:45	JP	ESR1118	JP
9-12					13:56	JP	ESR1118A	JP

Comments: * Start time = 12:41

Page No.: **369663** B(cont. from page NA B)

Form 780r8.doc (6/23/06)

Reviewed By / Date

JP 11/18/08

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Date 11/19/08SOP 724r 10

Paragon Analytics
 Low Background Gas Flow Proportional Counter Log
 Instrument: **LB4100B**

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKB1117W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	850	Dr A	0.15
	↓	Dr B	↓
Tank 2	550	Dr C	
	↓	Dr D	↓

Comments:

Radiochemistry Instrument Worksheet

Paragon Analytics

Prep Batch: RA081001-2

Prep Procedure: RA228

Analytical QASS / NCR? Y **QNA**

Prep Num	LabID	QC Type	Init Aliq	Fin Aliq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	0822001-1	SMP	1500	1500	ml	PCIL											
1	0822001-2	SMP	1500	1500	ml	PCIL											
1	0822001-3	SMP	1500	1500	ml	PCIL											
1	0822001-4	SMP	1500	1500	ml	PCIL											
1	0822001-5	SMP	1500	1500	ml	PCIL											

JP 11/24/08

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	STRONTIUM	247960	2,004,008	pCi/ml	NA	1	ml	RS-006

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Sr-89	865.3610.08	2,102.511	DPM/ml	10/01/08	5	ml	RS-015

Reporting Units

Sample Barcodes

0822001-1 RA081001-2PS1		0822001-2 RA081001-2PS2	
0822001-3 RA081001-2PS3		0822001-4 RA081001-2PS4	
0822001-5 RA081001-2PS5			

*Outlier

Radiochemistry Prep Worksheet

Paragon Analytics

Prep Batch: RA081001-2

Prep Procedure: RA228

Reviewed By: JRK *pk* Review Date: 10/1/2008

Non-Routine Pre-Treatment? ☒ Y / ☒ N Batch: *pk* Re-Prep? ☒ Y / ☒ N Prep QASS / NCR? ☒ Y / ☒ N *pk*

Prep SOP: PAI 746 Rev: 8
Prep SOP: NONE
Matrix Class: liquid
Prep Analyst: Jeff Kujawa
Prep Date: 10/1/2008
Prep Dept: RS

Balance:
Balance:

Sample Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0822001-1	SMP		1500	1500	Unfiltered			T1,S1	
2	1	0822001-2	SMP		1500	1500	Unfiltered			T1,S1	
3	1	0822001-3	SMP		1500	1500	Unfiltered			T1,S1	
4	1	0822001-4	SMP		1500	1500	Unfiltered			T1,S1	
5	1	0822001-5	SMP		1500	1500	Unfiltered			T1,S1	

Comments

Sr-89 spike and carrier spiked onto planchet with 8 mL concentrated HNO₃.

Spiked By: Jeff Kujawa Date: 10/1/2008
Witnessed By: Melissa Cromer Date: 10/1/2008
Yttrium Added By: N/A Date:
Witnessed By: N/A Date:

Transfer/Carrier Solution Information					
Soln #	Nuclide	SolnID	Prep Conc	Units	Pipet ID
T1	STRONTIUM	247960	2,004.008	pCi/ml	NA
				1	ml
					RS-008

Spike Solution Information					
Soln #	Nuclide	SolnID	Prep Conc	Units	Pipet ID
S1	Sr-89	865.3610.08	2,102.511	DPM/ml	10/01/08
				5	ml
					RS-015

Radiochemistry Prep Worksheet

Paragon Analytics

Prep Batch: RA081001-2

Prep Procedure: RA228

Prep Batch Not Validated!!!

Reviewed By: _____ Review Date: _____

Non-Routine Pre-Treatment? Y / N Batch: _____

Re-Prep? Y / N Batch: _____ Prep QASS / NCR? Y / N _____

Prep SOP: PAI 746 Rev: 8

Prep SOP: NONE

Matrix Class: liquid

Prep Analyst: Jeff Kujawa

Prep Date: 10/1/2008

Prep Dept: RS

Balance: _____

Balance: _____

Sample Num	Prep Num	LabID	QC Type	Dish No.	Init Aliq ml	Fin Aliq ml	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0822001-1	SMP		1500	1500	Unfiltered			T1,S1	
2	1	0822001-2	SMP		1500	1500	Unfiltered			T1,S1	
3	1	0822001-3	SMP		1500	1500	Unfiltered			T1,S1	
4	1	0822001-4	SMP		1500	1500	Unfiltered			T1,S1	
5	1	0822001-5	SMP		1500	1500	Unfiltered			T1,S1	

Comments

Sr-89 spike and carrier spiked onto planchet with 8 mL concentrated HNO₃.

Spiked By: JK Date: 10/1/08

Yttrium Added By: KA Date: 10/1/08

Tracer/Carrier Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
T1	STRONTIUM	247960	2,004.008	pCi/ml	NA	RS-006

exp 8/4/09

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Sr-89	865.3610.08	2,102.511	DPM/ml	10/01/08	RS-015

exp 7/8/09

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Ra-228 Outlier Test

	Beta CPM	Mean 1	Absolute Diff from mean1	Mean 2	Absolute Diff from mean2	% Diff	UCL Mean+5%	LCL Mean-5%	
C1	0822001-1	4300.4	4360	59.3184	4333.8055	33.3735	0.77%	4550.49578	4117.11523
C1	0822001-2	4456.9	4360	97.1796	4333.8055	123.1245	2.84%	4550.49578	4117.11523
C1	0822001-3	4463.5	4360	103.7796	4333.8055	129.7245	2.99%	4550.49578	4117.11523
C1	0822001-4	4286.6	4360	73.1204	4333.8055	47.1755	1.09%	4550.49578	4117.11523
C1	0822001-5	4291.2	4360	68.5204	4333.8055	42.5755	0.98%	4550.49578	4117.11523

Mean of all five planchets:

Mean 1 4359.8

Mean of closest four planchets:

Mean 2 4333.8

Criteria: should be within 5%: SOP 743

PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-AW
 Counting Unit ID: Orange
 High Voltage Mode: Simultaneous
 Application Revision: C
 Rev.12/28/03 JE

Background logfile: BKGAB
 Date of Bkg. Cal: 9/28/08
 Alpha efficiency logfile: Am241-10/08
 Beta efficiency logfile: Am0907
 Beta attenuation calibration: S0907

Alpha prog. logfile: n/a
 Alpha prog. attenuation: n/a
 Beta prog. logfile: n/a
 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
$y = b'm^a/g^x (mass \rightarrow x)$		$y = b'm^a/g^x (mass \rightarrow x)$	
Alpha b=	1.18128	Beta b=	1.0792
m=	0.99200	m=	0.9995
a=	1.0000	a=	1.0000
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
$y = b'm^a \cdot x$		$y = b'm^a \cdot x$	
a->b xtalk b=	0.1871	b->a xtalk b=	-2.000E-46
a->b xtalk m=	0.9983	b->a xtalk m=	0.0021

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity				Beta Activity				Gross CPM	Bkg. CPM	a>b xtalk CPM	Progeny Eff	Progeny Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
					Gross CPM	Bkg. CPM	b>a xtalk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.
A1	0822001-1	10/20/08 10:26	10.00	0.0	3.500	0.072	0.031	0.2085	1.101	n/a	n/a	0.2175	1.079	4302.400	1.588	0.6414	0.2175	n/a	n/a

JP 10/6/08

Alpha Attenuation Calibration		Beta Attenuation Calibration	
$y = b \cdot m^a / (m + c)$	$y = b \cdot m^a / (m + c)$	$y = b \cdot m^a / (m + c)$	$y = b \cdot m^a / (m + c)$
Alpha =	Beta =	Alpha =	Beta =
1.0170	1.0170	1.0170	1.0170
m =	m =	m =	m =
0.9920	0.9920	0.9920	0.9920
a =	a =	a =	a =
1.0000	1.0000	1.0000	1.0000
x =	x =	x =	x =
0.0000	0.0000	0.0000	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
$y = b \cdot m^a$	$y = b \cdot m^a$	$y = b \cdot m^a$	$y = b \cdot m^a$
a =	a =	a =	a =
0.1071	0.1071	0.1071	0.1071
b =	b =	b =	b =
-2.0000e-06	-2.0000e-06	-2.0000e-06	-2.0000e-06
m =	m =	m =	m =
0.9983	0.9983	0.9983	0.9983

Unit Type: LB4100-AW
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Alpha prog. logfile: n/a
Alpha prog. attenuation: n/a
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity							Beta Activity							
					Gross CPM	Bkg. CPM	b>a xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	
A1	0822001-2	10/2008 10:39	10:00	0.0	4,800	0.072	9,360	0.2095	1.101	n/a	n/a	n/a	4458,900	1,968	0.8472	0.3715	1.079	n/a	n/a

JD 10/6/08

Unit Type: LB4100-4W	Data file name: RA41002B	Background logfile: BKGA08
Counting Unit ID: Orange	Batch ID: RA081001-2	Date of Bkg. Cal: 9/28/08
High Voltage Mode: Simultaneous	Count Preset (m): 10	Alpha efficiency logfile: An241-41
Application Revision: C	Batch End: 10/2/08 10:50	Alpha attenuation calibration: An0907
Application Version: PA		Beta efficiency logfile: \$B89-49/
Rev.12/29/03 JE		Beta attenuation calibration: S0907

Alpha Attenuation Calibration $y = b \cdot m^{\alpha} \cdot (mass \cdot x)^{\beta}$ Alpha $b =$	Beta Attenuation Calibration $y = b \cdot m^{\alpha} \cdot (mass \cdot x)^{\beta}$ Beta $b =$
$m = 0.99200$	$m = 0.9995$
$\alpha = 1.0000$	$\alpha = 1.0090$
$x\sigma = 0.0000$	$x\sigma = 0.0000$
Alpha to Beta X-talk $y = b \cdot m^{\alpha} \cdot x$	Beta to Alpha X-talk $y = b \cdot m^{\alpha} \cdot x$
$a \rightarrow b \text{ talk} = 0.1871$	$b \rightarrow a \text{ talk} = -2.000E-06$
$a \rightarrow b \text{ talk} = 0.9593$	$b \rightarrow a \text{ talk} = 0.0021$

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity						Beta Activity								
					Gross CPM	Bkg. CPM	b>a xlik CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xlik CPM	Base Eff	Base Cor.Fact.	Progeny Eff	Progeny Cor.Fact.	
A1	0822001-3	10/20/08 10:50	10:00	0.0	3.100	0.072	9.373	0.2095	1.101	n/a	n/a	n/a	4465.500	1.968	0.5665	0.4175	1.079	n/a	n/a

JP 10/6/08

Alpha Attenuation Calibration	Beta Attenuation Calibration
$y = b \cdot m \cdot e^{(x/(mass \cdot \alpha))}$ Alpha = 1.10120 m = 0.99200 a = 1.0000 x0 = 0.0000	$y = b \cdot m \cdot e^{(x/(mass \cdot \beta))}$ Beta = 0.17492 m = 0.9995 a = 1.0000 x0 = 0.0000
Alpha to Beta X-talk $y = b \cdot m \cdot x$	Beta to Alpha X-talk $y = b \cdot mass \cdot x + m$
$b > a$ xtalk m = 0.1874 $b > a$ xtalk m = 0.9983	$b > a$ xtalk m = -2.000E+06 $b > a$ xtalk m = 0.0021

Unit Type: LB4100-AW
Counting Unit ID: Orange
High Voltage Mode: Simultaneous
Application Revision: C
Application Version: PA
Rev.12/29/03 JE

Beta Activity	
Gross CPM	Bkg. CPM
4288.600	1.968
a>b xtlk CPM	0.8098
Base Eff	0.4375

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PAI - Gas Flow Proportional Sample Analysis LB4100-A

Unit Type: LB4100-AW
 Counting Unit ID: Orange
 High Voltage Mode: Simultaneous
 Application Revision: C
 Rev.12/29/03 JE

Data file name: RAA1002D
 Batch ID: RA081001-2
 Count Preset (m): 10
 Batch Ended: 10/2/08 11:16

Background logfile: BKGAB
 Date of Bkg. Cal: 9/28/08
 Alpha efficiency logfile: Am241-10/08
 Alpha attenuation calibration: Am9907
 Beta efficiency logfile: SRS-05/07
 Beta attenuation calibration: S0907

Alpha prog. logfile: n/a
 Alpha prog. attenuation: n/a
 Beta prog. logfile: n/a
 Beta prog. attenuation: n/a

Alpha Attenuation Calibration		Beta Attenuation Calibration	
$y = b \cdot m^a [g(mass \cdot x)]$		$y = b \cdot m^a [g(mass \cdot x)]$	
Alpha b=	1.10120	Beta b=	1.0792
m=	0.99200	m=	0.9995
a=	1.0000	a=	1.0000
x0=	0.0000	x0=	0.0000
Alpha to Beta X-talk		Beta to Alpha X-talk	
$y = b \cdot m^a \cdot x$		$y = b \cdot m^a \cdot x$	
a -> b xtalk b=	0.1871	b -> a xtalk b=	-2.000E-06
a -> b xtalk m=	0.9993	b -> a xtalk m=	0.0021

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity						Beta Activity					
					Gross CPM	Bkg. CPM	a>b xtlk CPM	Progeny Eff	Base Cor.Fact.	Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xtlk CPM	Base Eff	Progeny Eff	Progeny Cor.Fact.
A1	0822001-5	10/2/08 11:16	10:00	0.0	3.600	0.072	5.072	0.2095	1.101	n/a	4293.200	1.568	0.5601	0.4175	1.079	n/a

JP 10/6/08

Prepare a working dilution of ~~RSD# 865~~ at ~10,000 dpm
~~RSD# 865.3610.07~~
 JDD 6/24/08

1) Density of 0.1 M HCl lot #068438 balance
 Mass of 100 ml volumetric flask 68.2945 g 12
 Mass of flask + 100 ml Acid 168.0504 g 12
 Net Mass of Acid = 99.7554 g 99.7509 g
 $\rho = \frac{99.7554 \text{ g}}{100 \text{ ml}} = 0.997554 \text{ g/ml}$
 $\rho = 0.997554 \text{ g/ml}$

2) Transfer Std.
 Mass of empty vial (No lid) 21.6922 g 12
 Mass of vial + std. Transferred 34.6989 g 12
 Net Mass of Std. Transferred 13.0067 g

3) Dilute w/ 0.1 M HCl
 Mass of Std, diluent, and vial 60.7240 g 12
 Mass of Vial 21.6922 g 12
 Net Mass of Dilution 39.0318 g

Activity Calculation

$$\left(\frac{30462.38 \text{ dpm}}{\text{g}} \right) \left(13.0067 \text{ g} \right) \left(\frac{0.997509 \text{ g/ml}}{0.997554 \text{ g/ml}} \right) = 10126.25 \text{ dpm}$$

39.0318 g

JDD 7/10/08
10,125.80 dpm/ml

Std ID: 865.3610.08

Description: Sr-89

Expiration: 7/8/2009

Activity: 10125.80 dpm/ml

2s Uncertainty: 172.14 dpm/ml

Ref. Date: 6/9/2008

Ref Time: N/A

Prep Date: 6/24/2008 Prep by: jdd

Matrix/Comp. 0.1 M HCl

Half Life (y): 1.38E-01

Reverification Log

Analysis Date Initials Expiration Date

Continued on Page

Read and Understood By

Signed

Date

Signed

Date



Eckert & Ziegler

Analytics

RSO #
865

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

77540-307

Sr-89 50 mL Liquid in Flame Sealed Vial

Customer: Paragon Analytics

P. O. No.: 73625, Item 1

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-89
Activity (Bq):	2.557 E4
Half-Life:	50.53 days
Calibration Date:	June 9, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7 %

Comments:

Impurities: γ -impurities <0.1%

50.36376 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

Source Prepared By: _____

W. Mao, Radiochemist

QA Approved: _____

D. M. Montgomery, QA Manager

Date: 6-19-08

End of Certificate

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

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Radiochemistry Solution Report

Solution Id: 247960	Name: Strontium Carrier+1<4>	Lot:	Vendor Name:	Type: IS
---------------------	------------------------------	------	--------------	----------

Final Vol: 1000	Dept: RS	Prep By: DBC	on	8/3/2007	Reviewed By: JRK	on	8/28/2007
Units: mL	Location: SR/RA	Opened By:	on		Verified By: DBC	on	8/3/2007
Matrix: LIQUID	ExpireDate: 8/4/2009	Received By:	on		Deactivated By:	on	

Comment:

Component Name	Component ID	Volume Added	Units
Strontium Stable Carrier Source<1>	8256 Y07595	4.8406	g

Calibrated Primary Calibration Reference

CompName	Act/Conc	Date	1/2 Life (Yrs)	Final Act/Conc	Summed Conc	Units
STRONTIUM	414000	11/24/2008		2004.008		pCi/ml

Associated Parent IDs

8256 Y07595

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
NE = Not Entered

(Prnt) = Secular equilibrium; parent half life used to calculate concentration.

Date Printed: Monday, November 24, 2008

Paragon Analytics

A Division of Datachem Laboratories

Standards DB Version: 1.091

Internal Calculation Verifications

**ICBs
&
ICVs**

Sr-89/Ra-228 ICV/ICB
LB4100-b

Detector	Sample ID	Sampling Date & Time	Ingrowth Date & Time	Decay Date & Time	Cnt Start Date & Time	Initial Vol	Final Vol	Count Dur	Gross CPM	Bkg CPM	Efficiency	Ba Yield	Y Yield	Total Yield	Net CPM	Activity pCi/vol	TPU 2 sig	MDC	% Rec
A3	RA081113-1AMB	11/13/2008 12:00	11/14/2008 16:45	11/20/2008 9:45	11/20/2008 12:39	1.50	1.494	250	1428	1.319	0.4382	0.832	0.739	0.615	0.109	0.21	0.33	0.68	
B2	RA081113-1BMB	11/13/2008 12:00	11/14/2008 16:45	11/20/2008 9:45	11/20/2008 12:39	1.50	1.494	250	1336	1.640	0.4444	0.849	0.703	0.597	-0.304	-0.60	0.38	0.77	
C4	RA081113-1CMB	11/13/2008 12:00	11/14/2008 16:45	11/20/2008 9:45	11/20/2008 12:39	1.50	1.494	250	1336	1.536	0.4244	0.854	0.630	0.538	-0.2	-0.46	0.41	0.86	
D2	RA081113-1DMB	11/13/2008 12:00	11/14/2008 16:45	11/20/2008 9:45	11/20/2008 12:39	1.50	1.494	250	1694	1.598	0.4484	0.815	0.684	0.558	0.086	0.18	0.39	0.80	
A2	0823003-1	11/13/2008 12:00	11/14/2008 16:45	11/20/2008 9:45	11/20/2008 12:39	1.50	1.494	250	7800	1.345	0.4406	0.887	0.693	0.614	6.455	12.55	3.79	0.68	78.0%
B3	0823003-2	11/13/2008 12:00	11/14/2008 16:45	11/20/2008 9:45	11/20/2008 12:39	1.50	1.494	250	9420	1.479	0.4309	0.872	0.637	0.556	7.941	17.44	5.25	0.81	108.4%
C2	0823003-3	11/13/2008 12:00	11/14/2008 16:45	11/20/2008 9:45	11/20/2008 12:39	1.50	1.494	250	9700	1.526	0.4414	0.852	0.623	0.531	8.174	18.35	5.52	0.84	114.1%
D4	0823003-4	11/13/2008 12:00	11/14/2008 16:45	11/20/2008 9:45	11/20/2008 12:39	1.50	1.494	250	11320	2.538	0.4327	0.887	0.655	0.590	8.782	18.10	5.44	0.99	112.5%

Spike Information

Sample ID	Spike ID	Ref Date	Ra-228 Act DPM/mL	Spike Vol mL	Ra-228 Act Added
RA081113-1AMB	784.3020.38	11/13/2008	53.58	0.0	0.0
RA081113-1BMB	784.3020.38	11/13/2008	53.58	0.0	0.0
RA081113-1CMB	784.3020.38	11/13/2008	53.58	0.0	0.0
RA081113-1DMB	784.3020.38	11/13/2008	53.58	0.0	0.0
0823003-1	784.3020.38	11/13/2008	53.58	1.0	16.1
0823003-2	784.3020.38	11/13/2008	53.58	1.0	16.1
0823003-3	784.3020.38	11/13/2008	53.58	1.0	16.1
0823003-4	784.3020.38	11/13/2008	53.58	1.0	16.1

Ra-228 Decay	Ac-228 Ingrowth	Ac-228 Decay	Cnt Time Ingrowth	Cnt Time Adj.	K
0.9977	1.0000	0.7204	0.3757	0.4711	0.2415
0.9977	1.0000	0.7204	0.3757	0.4711	0.2375
0.9977	1.0000	0.7204	0.3757	0.4711	0.2046
0.9977	1.0000	0.7204	0.3757	0.4711	0.2240
0.9977	1.0000	0.7204	0.3757	0.4711	0.2424
0.9977	1.0000	0.7204	0.3757	0.4711	0.2145
0.9977	1.0000	0.7204	0.3757	0.4711	0.2099
0.9977	1.0000	0.7204	0.3757	0.4711	0.2285

1 sig CU	1 sig TPU
0.1636	0.1666
0.1658	0.1884
0.1910	0.2029
0.1907	0.1926
0.3517	1.8952
0.4404	2.6254
0.4422	2.7591
0.4387	2.7224

r:\inst\gp\calibration\LB4100B\0823003RA228ICB&ICV.xls

Alpha Attenuation Calibration	Beta Attenuation Calibration
$y = b \cdot m^a (e^{(c \cdot \text{mass} \cdot x)^d})$	$y = b \cdot m^a (e^{(c \cdot \text{mass} \cdot x)^d})$
Beta = b	Beta = b
m = 1.20880	m = 1.0580
c = 0.95620	c = 0.9995
a = 0.6919	a = 1.0000
d = 29.5000	d = 0.0000
Alpha to Beta x talk	Beta to Alpha x talk
$y = b \cdot m^a \cdot \text{mass}$	$y = b \cdot \text{mass} + m$
a = talk	b = a talk
b = 0.0000	b = -2.001e-06
c = talk	c = talk
d = 0.0000	d = 0.0011

Alpha prog. logfile: TRB-01/08
Alpha prog. attenuation: TRB-01/08
Beta prog. logfile: n/a
Beta prog. attenuation: n/a

Det. ID	Sample ID	Count End Date & Time	Count Dur. (min)	Resid. Mass (mg)	Alpha Activity						Beta Activity						
					Gross CPM	Bkg. CPM	b>a xlik CPM	Base		Progeny Cor.Fact.	Gross CPM	Bkg. CPM	a>b xlik CPM	Base			
								Eff	Cor.Fact.					Base Eff	Cor.Fact.		
A2	0823003-1	11/20/08 16:39	250.00	0.0	0.204	0.075	0.007	0.2521	1.336	0.2005	1.336	7.800	1.345	n/a	0.4406	1.086	n/a
A3	RA081113-1AMB	11/20/08 16:38	250.00	0.0	0.080	0.054	0.000	0.2539	1.336	0.2085	1.336	1.428	1.319	n/a	0.4382	1.096	n/a
C2	0823003-3	11/20/08 16:39	250.00	0.0	0.176	0.084	0.009	0.2549	1.336	0.1880	1.336	9.700	1.526	n/a	0.4414	1.096	n/a
C4	RA081113-1CMB	11/20/08 16:39	250.00	0.0	0.064	0.080	0.000	0.2401	1.336	0.1880	1.336	1.538	1.520	0.0000	0.4244	1.096	n/a
D2	RA081113-1DMB	11/20/08 16:39	250.00	0.0	0.100	0.074	0.000	0.2496	1.336	0.2050	1.336	1.684	1.598	n/a	0.4484	1.086	n/a
D4	0823003-4	11/20/08 16:39	250.00	0.0	0.224	0.067	0.010	0.2454	1.336	0.1876	1.336	11.320	2.558	n/a	0.4327	1.096	n/a
B2	RA081113-1BMB	11/20/08 16:39	250.00	0.0	0.064	0.068	0.000	0.2510	1.336	0.2054	1.336	1.640	1.427	0.0000	0.4444	1.096	n/a
B3	0823003-2	11/20/08 16:39	250.00	0.0	0.175	0.084	0.009	0.2443	1.336	0.1876	1.336	9.420	1.479	n/a	0.4309	1.096	n/a

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Date 11/20/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: **LB4100B**

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	P			P
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKBI117W			
Dr B				
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	500	Dr A	0.15
		Dr B	
Tank 2	550	Dr C	
		Dr D	

Comments:

Date 11/20/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100B

Det.	Sample ID	Batch	Test	Count Dur. (min)	Start Time	Analyst Initials	File ID	Output Initials
1-16	Daily EFP	—	—	30	7:18	JP	FFB1120	JP
1-16	Daily Bkg	—	—	60	7:29	JP	BKB1120	JP
2	601	Am Wipe ICV	α	10 30	8:35	JP	ABB1120	JP
3	729	Sr Wipe ICV	B	10 ↓	↓	JP	↓	↓
9	0714506-B1	SR070220-1	Sr90	30	8:36	JP	SRB1120	JP
14	↓ -B2	↓ (ICV)	↓	↓	↓	↓	↓	↓
12	↓ -S1	↓	↓	↓	↓	↓	↓	↓
15	↓ -S2	↓	↓	↓	↓	↓	↓	↓
7	↓ B3	↓	↓	↓	↓	↓	↓	↓
5	↓ S3	↓	↓	↓	↓	↓	↓	↓
5	729	Sr Wipe ICV	B	30	9:28	JP	ABB1120A	JP
8	601	Am Wipe ICV	α	↓	↓	↓	↓	↓
1	0714506-B1	SR070220-1	Sr90	30	9:29	JP	SRB1120A	JP
4	↓ S1	↓	↓	↓	↓	↓	↓	↓
9	601	Am Wipe ICV	α	30	10:00	JP	ABB1120B	JP
11	729	Sr Wipe ICV	B	↓	↓	↓	↓	↓
15	729	Sr Wipe ICV	B	30	10:32	JP	ABB1120C	JP
16	601	Am Wipe ICV	α	↓	↓	↓	↓	↓
4	0823005-1	RA081119-1	Outlier	10	11:25	JP	RAB1120	JP
4	↓ -2	↓	↓	↓	11:37	JP	RAB1120A	JP
4	↓ -3	↓	↓	↓	11:50	JP	RAB1120B	JP
4	↓ -4	↓	↓	↓	12:03	JP	RAB1120C	JP
4	↓ -5	↓	↓	↓	12:15	JP	RAB1120D	JP
2	0823003-1	RA081113-1	Ra228	250	12:27	JP	RAB1120E	JP
7	↓ -2	↓	↓	↓	↓	↓	↓	↓
10	↓ -3	↓	↓	↓	↓	↓	↓	↓
16	↓ -4	↓	↓	↓	↓	↓	↓	↓
3	RA081113-1AMB	↓	↓	↓	↓	↓	↓	↓
6	BMB	↓	↓	↓	↓	↓	↓	↓
12	CMB	↓	↓	↓	↓	↓	↓	↓
14	DMB	↓	↓	↓	↓	↓	↓	↓
JP 11/21/08								

Comments:

Date 11/21/08SOP 724r 10

Paragon Analytics
Low Background Gas Flow Proportional Counter Log
Instrument: LB4100B

Instrument Daily Response and Background Checks

Det.	Daily Response Check				Background Check				Det. Status
	Start 1	Status	Start 2	Status	Start 1	Status	Start 2	Status	
1	JP	P			JP	HB	JP	P	P
2	↓	↓			↓	P			↓
3	↓	↓			↓	↓			↓
4	↓	↓			↓	↓			↓
5	↓	↓			↓	HB	JP	P	↓
6	↓	↓			↓	P			↓
7	↓	↓			↓	↓			↓
8	↓	↓			↓	↓			↓
9	↓	↓			↓	↓			↓
10	↓	↓			↓	↓			↓
11	↓	↓			↓	↓			↓
12	↓	↓			↓	↓			↓
13	↓	↓			↓	↓			↓
14	↓	↓			↓	↓			↓
15	↓	↓			↓	↓			↓
16	↓	↓			↓	↓			↓

Det = Detector; α = Alpha; β = Beta; P = Pass; H = High; L = Low; OL = Offline; R = Recount; W = Weekly; NP = Not Processed

Weekly Background Calibration

	Current Calib. File ID	Weekly Calib. Started	Status	File ID
Dr A	BKB1117W			
Dr B	↓			
Dr C				
Dr D				

Dr = Drawer

Gas Supply

P-10 Supply		P-10 Flow	
Tank 1	260	Dr A	0.15
	↓	Dr B	↓
Tank 2	550	Dr C	↓
	↓	Dr D	↓

Comments:

Radiochemistry Instrument Worksheet

Paragon Analytics

Prep Batch: RA081113-1

Prep Procedure: RA228

Analytical QASS / NCR? Y NA

Prep Num	LabID	QC Type	Init Aliq	Fin Aliq	Units	Report Units	Residual Mass (mg)	Cnt 1 File	Cnt 1 Ins/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Ins/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Ins/Det	Cnt 3 Pos Chk By	Notes
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1	0823003-1	SMP	1500	1494.2	ml	PC/L											
1	0823003-2	SMP	1500	1494.2	ml	PC/L											
1	0823003-3	SMP	1500	1494.2	ml	PC/L											
1	0823003-4	SMP	1500	1494.2	ml	PC/L											
1	RA081113-1A	MB	1500	1494.2	ml	PC/L											
1	RA081113-1B	MB	1500	1494.2	ml	PC/L											
1	RA081113-1C	MB	1500	1494.2	ml	PC/L											
1	RA081113-1D	MB	1500	1494.2	ml	PC/L											

JTP 11/24/08

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	YTTRIUM	247972	9,003.596	ppm	NA	1	ppm	RS-008
T2	BARIUM	247973	16,023.752	pCi/ml	NA	2	ml	RS-015

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	Ra-228	784.3020.38	53.577	DPM/ml	11/13/08	1	ml	RS-006

Reporting Units

Sample Barcodes

0823003-1 RA081113-1PS1		0823003-2 RA081113-1PS2	
0823003-3 RA081113-1PS3		0823003-4 RA081113-1PS4	
RA081113-1AMB RA081113-1PS5		RA081113-1BMB RA081113-1PS6	
RA081113-1CMB RA081113-1PS7		RA081113-1DMB RA081113-1PS8	
RA081113-1CAR RA081113-1PS9			

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Radiochemistry ICP Worksheet

Paragon Analytics

Prep Batch: RA081113-1

Prep Procedure: RA228

Reviewed By: JRK

Review Date: 11/21/2008

BARIUM Recovery Results

Reference Carrier

LabID	QC Type	Carr Vol	Ref Carr Dil Vol	Ref Carr ICP Alq	Ref Carr ICP Run	Ref Carr ICP Conc
RA081113-1	CAR	2	1502	1	10	IR081120-1A1 2.065983

Samples

Prep Num	LabID	QC Type	Init Samp Alq (ml)	Car Vol (ml)	Samp Dil Vol (ml)	Init ICP Dil Vol (ml)	Pre-Con Vol (ml)	Post-Con Vol (ml)	Pre-Sep Vol (ml)	Post-Sep Vol (ml)	Fin ICP Alq (ml)	Fin ICP Dil Vol (ml)	Initial ICP Run	Final ICP Run	Init ICP Conc (ug/ml)	Fin ICP Conc (ug/ml)	Init Samp Mass (ug)	Ref Mass (ug)	Flag	Fin Samp Mass (ug)	% Yield	Final Sample Alq
1	0823003-1	SMP	1500	2	26	0.1	1000	25.9	25.9	55	0.1	1000	IR081120-1A1	IR081120-1A1	0.11215	0.049824	29046.06	30911.71	LB	27403.15	88.65%	1494
1	0823003-2	SMP	1500	2	26	0.1	1000	25.9	25.9	55	0.1	1000	IR081120-1A1	IR081120-1A1	0.11173	0.04903	28938.75	30911.71	LB	26966.37	87.24%	1494
1	0823003-3	SMP	1500	2	26	0.1	1000	25.9	25.9	55	0.1	1000	IR081120-1A1	IR081120-1A1	0.11327	0.047873	29336.7	30911.71	LB	26330.19	85.18%	1494
1	0823003-4	SMP	1500	2	26	0.1	1000	25.9	25.9	55	0.1	1000	IR081120-1A1	IR081120-1A1	0.11467	0.049841	29698.88	30911.71	LB	27412.65	88.69%	1494
1	RA081113-1A	MB	1500	2	26	0.1	1000	25.9	25.9	55	0.1	1000	IR081120-1A1	IR081120-1A1	0.11313	0.046785	29300.93	30911.71	LB	25731.99	83.24%	1494
1	RA081113-1B	MB	1500	2	26	0.1	1000	25.9	25.9	55	0.1	1000	IR081120-1A1	IR081120-1A1	0.11004	0.047700	28500.55	30911.71	LB	26235.24	84.87%	1494
1	RA081113-1C	MB	1500	2	26	0.1	1000	25.9	25.9	55	0.1	1000	IR081120-1A1	IR081120-1A1	0.11046	0.048011	28607.87	30911.71	LB	26406.15	85.42%	1494
1	RA081113-1D	MB	1500	2	26	0.1	1000	25.9	25.9	55	0.1	1000	IR081120-1A1	IR081120-1A1	0.109	0.0458	28231	30911.71	LB	25190	81.49%	1494

YTTRIUM Recovery Results

Reference Carrier

LabID	QC Type	Carr Vol	Ref Carr Dil Vol	Ref Carr ICP Alq	Ref Carr ICP Run	Ref Carr ICP Conc
RA081113-1	CAR	1	50	0.5	10	IR081121-1A1 10.38113

Samples

Prep Num	LabID	QC Type	Init Samp Alq (ml)	Car Vol (ml)	Samp Dil Vol (ml)	Init ICP Dil Vol (ml)	Pre-Con Vol (ml)	Post-Con Vol (ml)	Pre-Sep Vol (ml)	Post-Sep Vol (ml)	Fin ICP Alq (ml)	Fin ICP Dil Vol (ml)	Initial ICP Run	Final ICP Run	Init ICP Conc (ug/ml)	Fin ICP Conc (ug/ml)	Init Samp Mass (ug)	Ref Mass (ug)	Flag	Fin Samp Mass (ug)	% Yield	Final Sample Alq
1	0823003-1	SMP	1500	1	50	0.5	50	50	50	50	0.5	10	IR081121-1A1	IR081121-1A1	0	7.192282	10381.13	10381.13		7192.232	69.28%	NA
1	0823003-2	SMP	1500	1	50	0.5	50	50	50	50	0.5	10	IR081121-1A1	IR081121-1A1	0	6.614347	10381.13	10381.13		6614.346	63.72%	NA
1	0823003-3	SMP	1500	1	50	0.5	50	50	50	50	0.5	10	IR081121-1A1	IR081121-1A1	0	6.469247	10381.13	10381.13		6469.247	62.32%	NA
1	0823003-4	SMP	1500	1	50	0.5	50	50	50	50	0.5	10	IR081121-1A1	IR081121-1A1	0	6.903875	10381.13	10381.13		6903.876	66.50%	NA
1	RA081113-1A	MB	1500	1	50	0.5	50	50	50	50	0.5	10	IR081121-1A1	IR081121-1A1	0	7.674502	10381.13	10381.13		7674.502	73.93%	NA
1	RA081113-1B	MB	1500	1	50	0.5	50	50	50	50	0.5	10	IR081121-1A1	IR081121-1A1	0	7.300519	10381.13	10381.13		7300.52	70.32%	NA
1	RA081113-1C	MB	1500	1	50	0.5	50	50	50	50	0.5	10	IR081121-1A1	IR081121-1A1	0	6.539968	10381.13	10381.13		6539.969	63.00%	NA

1009120-1A1

Sample Id1	Al	Ba	Ca	Fe	K	Mg	Na	Pb	Sr	Y	Ni
CCV	48.8266	0.4866	51.6710	21.1897	18.9920	49.7566	19.5124	0.4877	0.4903	10.0385	0.5067
CCB	0.0330	0.0001	0.0128	0.0131	0.0419	0.0098	0.0822	-0.0023	0.0001	0.0027	0.0001
I 0823003-1	0.0056	0.1121	-0.0156	0.0068	0.0607	-0.0217	1.8116	0.5611	0.0505	-0.0042	0.0027
F 0823003-1	0.0158	0.0498	-0.0209	-0.0340	0.0447	-0.0160	12.5867	-0.0017	0.0181	-0.0025	0.0033
I 0823003-2	0.0048	0.1117	-0.0140	-0.0273	0.0381	-0.0232	1.8132	0.5515	0.0443	-0.0045	0.0028
F 0823003-2	0.0009	0.0490	-0.0231	-0.0358	0.0291	-0.0188	12.3837	-0.0044	0.0165	-0.0026	0.0022
I 0823003-3	0.0043	0.1133	-0.0237	-0.0291	0.0381	-0.0245	1.8123	0.5654	0.0502	-0.0046	0.0026
F 0823003-3	0.0071	0.0479	-0.0200	-0.0419	0.0689	-0.0185	12.0790	-0.0040	0.0178	-0.0029	0.0026
I 0823003-4	0.0119	0.1147	-0.0168	-0.0376	0.0285	-0.0232	1.8060	0.5618	0.0475	-0.0050	0.0023
F 0823003-4	0.0136	0.0498	-0.0212	-0.0385	0.0244	-0.0213	12.5381	-0.0033	0.0171	-0.0030	0.0027
I RA081113-1AMB	0.0136	0.1131	-0.0181	-0.0192	0.0370	-0.0219	1.7948	0.5555	0.0322	-0.0049	0.0027
F RA081113-1AMB	0.0112	0.0468	-0.0231	-0.0342	0.0471	-0.0211	11.8438	-0.0039	0.0114	-0.0031	0.0024
CCV	48.2860	0.4832	51.2812	21.0672	18.8009	49.3023	19.3406	0.4735	0.4871	9.9713	0.5037
CCB	0.0382	0.0000	0.0119	0.0095	0.0447	0.0066	0.0450	-0.0009	0.0001	0.0022	0.0002
I RA081113-1BMB	0.0194	0.1100	-0.0156	-0.0191	0.0368	-0.0209	1.7511	0.5485	0.0484	-0.0045	0.0023
F RA081113-1BMB	0.0175	0.0477	-0.0147	-0.0352	0.0422	-0.0202	12.0099	-0.0038	0.0171	-0.0025	0.0028
I RA081113-1CMB	0.0229	0.1105	-0.0112	-0.0201	0.0090	-0.0232	1.7726	0.5374	0.0455	-0.0047	0.0019
F RA081113-1CMB	0.0227	0.0480	-0.0228	-0.0317	0.0113	-0.0209	12.1478	-0.0046	0.0164	-0.0028	0.0021
I RA081113-1DMB	0.0203	0.1090	-0.0143	-0.0384	0.0075	-0.0226	1.7430	0.5292	0.0458	-0.0046	0.0025
F RA081113-1DMB	0.0138	0.0458	-0.0196	-0.0297	0.0237	-0.0213	11.6533	-0.0052	0.0162	-0.0031	0.0022
RA081113-1RC	0.1280	2.0660	0.1859	-0.0308	-0.0051	-0.0113	0.0083	-0.0043	0.0002	-0.0052	0.0028
CCV	48.1167	0.4816	50.4292	20.8076	18.8210	49.0504	19.3699	0.4765	0.4851	9.9046	0.5007
CCB	0.0339	0.0002	0.0106	0.0140	0.0093	0.0058	0.0424	-0.0013	0.0001	0.0025	0.0001
I 0810216-2	0.0187	0.0001	-0.0246	-0.0298	0.0519	-0.0224	0.0146	-0.0035	-0.0002	-0.0054	0.3681
F 0810216-2	0.0466	-0.0003	0.1388	-0.0128	0.0311	0.0000	-0.0071	-0.0029	-0.0002	-0.0048	1.7372
I 0810216-7	0.0426	0.0005	0.2055	-0.0183	0.0599	-0.0121	0.0316	-0.0030	0.0004	-0.0053	0.3613
F 0810216-7	0.0603	-0.0002	0.1768	0.0097	0.0255	0.0109	-0.0073	-0.0044	-0.0002	-0.0047	1.7831
I NI081117-1MB	0.0267	-0.0001	-0.0172	-0.0389	0.0368	-0.0266	0.0009	-0.0045	-0.0002	-0.0053	0.3646
F NI081117-1MB	0.0620	-0.0003	0.0985	0.0041	0.0177	-0.0128	-0.0080	-0.0039	-0.0002	-0.0049	1.7588
I NI081117-1LCS	0.0331	-0.0001	-0.0256	-0.0440	0.0422	-0.0230	-0.0038	-0.0032	-0.0003	-0.0054	0.3590
F NI081117-1LCS	0.0751	-0.0003	0.2354	0.0246	0.0267	0.0000	-0.0071	-0.0044	-0.0001	-0.0048	1.8119
I NI081117-1LCSD	0.0306	-0.0002	-0.0162	-0.0428	0.0375	-0.0230	-0.0021	-0.0064	-0.0003	-0.0054	0.3642
F NI081117-1LCSD	0.0828	-0.0003	0.2043	0.0223	0.0339	0.0294	-0.0059	-0.0038	-0.0001	-0.0048	1.8128
NI081117-1RC	0.0325	-0.0002	-0.0037	-0.0383	0.0635	-0.0226	-0.0054	-0.0042	-0.0002	-0.0053	0.3604
CCV	48.3802	0.4836	50.1669	20.6960	19.0051	48.7608	19.6645	0.4696	0.4863	9.8744	0.4943
CCB	0.0440	0.0001	0.0109	0.0112	0.0270	0.0072	0.0354	-0.0010	0.0001	0.0022	0.0003

Sample Id1	Al	Ba	Ca	Fe	K	Mg	Na	Pb	Sr	Y
I 0810269-10	65.8261	1.2031	60.2089	34.6312	25.6412	14.2201	13.8715	0.5425	0.3798	0.0384
F 0810269-10	0.1506	0.0058	17.2336	0.0186	0.0416	0.1197	2.9768	0.8688	0.0133	-0.0050
I 0810269-11	52.4212	1.1680	105.5570	31.6422	22.8231	12.8871	12.6351	0.5771	0.5091	0.0683
F 0810269-11	0.1011	0.0043	17.3986	-0.0038	0.0287	-0.0018	5.7530	0.8840	0.0121	-0.0051
I 0810269-12	56.7088	1.3915	129.3450	31.4726	22.9019	10.8016	12.7841	0.5739	0.6153	0.0876
CCV	49.8225	0.4979	51.2123	21.1809	19.7605	50.3683	20.4562	0.4912	0.4974	10.0309
CCB	0.0860	0.0005	0.0462	0.0204	0.0247	0.0156	0.0059	0.0019	0.0003	0.0023
F 0810269-12	0.0911	0.0045	17.5022	-0.0107	0.0100	0.0216	2.8888	0.8978	0.0121	-0.0033
I 0810269-12D	105.3557	2.7752	233.4371	58.5859	43.9047	20.7079	24.9972	(1.0990)	1.1926	0.1742
F 0810269-12D	0.1476	0.0069	17.0028	0.0161	0.0245	0.0036	3.0319	0.8198	0.0148	-0.0044
I 0810269-12MS	0.0868	0.0007	0.0871	-0.0164	0.0304	-0.0145	-0.0164	(0.0021)	0.0002	-0.0047
F 0810269-12MS	0.0811	0.0068	17.1131	-0.0184	0.0154	-0.0093	5.7972	0.8560	0.0165	-0.0049
I 0810269-12MSD	48.9149	1.2970	109.6681	30.8183	24.1822	10.6339	12.1751	0.5692	0.5740	0.0671
F 0810269-12MSD	0.1018	0.0064	17.5836	-0.0173	0.0137	-0.0087	3.7800	0.8648	0.0156	-0.0050
I 0810269-13	51.4407	1.5018	128.7162	32.6502	23.8281	11.8050	13.8080	0.6062	0.6265	0.0805
F 0810269-13	0.1088	0.0070	16.9372	-0.0017	0.0279	-0.0053	2.9543	0.9174	0.0168	-0.0051
I 0810269-15	63.8725	1.1421	44.6569	38.7818	24.4415	10.5113	13.7927	0.5562	0.3482	0.0286
CCV	49.7374	0.4961	51.4548	21.2542	19.7387	50.3127	20.4625	0.4885	0.4963	10.0242
CCB	0.0789	0.0005	0.0426	0.0186	0.0225	0.0125	0.0058	0.0037	0.0002	0.0021
F 0810269-15	0.0738	0.0104	17.2576	-0.0147	0.0260	-0.0060	1.3845	0.9364	0.0182	-0.0039
I 0810269-16	58.8995	1.5181	109.3495	34.4451	23.3432	12.7623	13.8182	0.5987	0.5970	0.0792
F 0810269-16	0.1214	0.0173	17.3291	0.0159	0.0504	0.0004	1.4199	0.8588	0.0267	-0.0045
I PB081105-1MB	0.0689	0.0004	0.0691	-0.0057	0.0451	-0.0153	-0.0208	0.5276	0.0001	-0.0048
F PB081105-1MB	0.0621	0.0004	17.5730	-0.0281	0.0313	-0.0140	2.3413	0.7238	0.0041	-0.0050
I PB081105-1LCS	0.0661	0.0002	0.0589	-0.0339	0.0338	-0.0191	-0.0211	0.5220	0.0000	-0.0051
F PB081105-1LCS	0.0580	0.0004	18.3643	-0.0331	0.0419	-0.0129	5.0959	0.6555	0.0061	-0.0052
PB081105-1RC	0.0570	-0.0001	0.0109	-0.0388	0.0252	-0.0220	-0.0221	0.4753	-0.0002	-0.0052
CCV	49.7148	0.4978	51.2243	21.2926	19.6993	50.2658	20.4277	0.4900	0.4976	10.0427
CCB	0.1034	0.0005	0.0486	0.0197	0.0242	0.0225	0.0086	0.0028	0.0003	0.0045
Y 0823003-1	0.0693	0.0003	0.1470	0.1557	0.0497	-0.0185	0.6657	-0.0028	0.0018	7.1922
Y 0823003-2	0.0981	0.0009	0.1329	0.0434	0.0460	-0.0185	0.5430	-0.0021	0.0080	6.6143
Y 0823003-3	0.0661	0.0096	0.1290	0.0404	0.0502	-0.0214	0.4872	-0.0012	0.0287	6.4692
Y 0823003-4	0.0899	0.0002	0.1755	0.0118	0.0578	-0.0202	0.5616	-0.0016	0.0018	6.9039
Y RA081113-1AMB	0.0597	0.0011	0.1639	0.0231	0.0414	-0.0196	0.6444	-0.0019	0.0026	7.6745
Y RA081113-1BMB	0.0572	0.0007	0.1501	0.0117	0.0402	-0.0191	0.6230	-0.0013	0.0061	7.3005
Y RA081113-1CMB	0.0710	0.0018	0.1410	0.0442	0.0740	-0.0113	0.3919	0.0032	0.0083	6.5400
Y RA081113-1DMB	0.0634	0.0016	0.1713	0.0521	0.0470	-0.0069	0.4893	-0.0008	0.0078	7.1033
RA081113-1RC	0.0497	-0.0003	0.2242	-0.0446	0.0463	-0.0191	-0.0328	-0.0024	-0.0003	10.3811
I 0810225-1	19.5144	0.4872	16.3412	48.6182	5.5969	11.9013	1.6123	4.1227	1.1604	0.0326
CCV	49.5644	0.4953	51.9585	21.4652	19.6001	50.3207	20.3982	0.4950	0.4956	10.0729
CCB	0.1069	0.0004	0.0338	0.0310	0.0257	0.0274	-0.0040	0.0011	0.0005	0.0079

Radiochemistry Prep Worksheet

Paragon Analytics

Prep Batch: RA081113-1

Prep Procedure: RA228

Reviewed By: JRK *[Signature]*

Review Date: 11/21/2008

Non-Routine Pre-Treatment? Y / ☒ N

Batch: *RA*

Re-Prep? Y / ☒ N

Batch: *RA*

Prep QASS / NCR? Y / ☒ N

14

Prep SOP: PAI 746 Rev: 8

Prep Analyst: Jeff Kujawa

Balance:

Prep Date: 11/13/2008

Balance:

Matrix Class: liquid

Prep Dept: RS

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Aliq ml	Fin Aliq ml	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0823003-1	SMP		1500	1494.231	Unfiltered	11/14/08 16:45	11/20/08 09:45	T1,T2,S1	
2	1	0823003-2	SMP		1500	1494.231	Unfiltered	11/14/08 16:45	11/20/08 09:45	T1,T2,S1	
3	1	0823003-3	SMP		1500	1494.231	Unfiltered	11/14/08 16:45	11/20/08 09:45	T1,T2,S1	
4	1	0823003-4	SMP		1500	1494.231	Unfiltered	11/14/08 16:45	11/20/08 09:45	T1,T2,S1	
5	1	RA081113-1A	MB		1500	1494.231	Unfiltered	11/14/08 16:45	11/20/08 09:45	T1,T2	
6	1	RA081113-1B	MB		1500	1494.231	Unfiltered	11/14/08 16:45	11/20/08 09:45	T1,T2	
7	1	RA081113-1C	MB		1500	1494.231	Unfiltered	11/14/08 16:45	11/20/08 09:45	T1,T2	
8	1	RA081113-1D	MB		1500	1494.231	Unfiltered	11/14/08 16:45	11/20/08 09:45	T1,T2	

Comments

Spiked By: Jeff Kujawa

Date: 11/13/2008

Yttrium Added By: Jeff Kujawa

Date: 11/14/2008

Witnessed By: Gabriel D. Wagner

Date: 11/13/2008

Witnessed By: Derek B. Caduff

Date: 11/14/2008

Tracer/Carrier Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
T1	YTTRIUM	247972	9,003.596	ppm	NA	RS-006
T2	BARIUM	247973	16,023.752	ppm	NA	RS-015

Spike Solution Information						
Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Pipet ID
S1	Ra-228	784.3020.38	53.577	DPM/ml	11/13/08	RS-006

Radiochemistry Prep Worksheet

Paragon Analytics

Prep Batch: RA081113-1

Prep Procedure: RA228

Prep Batch Not Validated!!!

Reviewed By:

Review Date:

Non-Routine Pre-Treatment? Y / N Batch:

Re-Prep? Y / N Batch:

Prep QASS / NCR? Y / N

Prep SOP: PAI 746 Rev: 8

Prep SOP: NONE

Matrix Class: liquid

Prep Analyst: Jeff Kujawa

Prep Date: 11/13/2008

Prep Dept: RS

Balance:

Balance:

Sample Num	Prep Num	QC Type	Dish No.	Init Aliq ml	Fin Aliq ml	Prep Basis	Ingrowth Date/Time	Decay Date/Time	Standards	Prep Notes
1	1	0823003-1	SMP	1500	1500	Unfiltered	11/14/08	11/20/08	T1, T2, S1	
2	1	0823003-2	SMP	1500	1500	Unfiltered	11/14/08	11/20/08	T1, T2, S1	
3	1	0823003-3	SMP	1500	1500	Unfiltered	11/14/08	11/20/08	T1, T2, S1	
4	1	0823003-4	SMP	1500	1500	Unfiltered	11/14/08	11/20/08	T1, T2, S1	
5	1	RA081113-1A	MB	1500	1500	Unfiltered	11/14/08	11/20/08	T1, T2	
6	1	RA081113-1B	MB	1500	1500	Unfiltered	11/14/08	11/20/08	T1, T2	
7	1	RA081113-1C	MB	1500	1500	Unfiltered	11/14/08	11/20/08	T1, T2	
8	1	RA081113-1D	MB	1500	1500	Unfiltered	11/14/08	11/20/08	T1, T2	

Comments

Spiked By: JKW Date: 11/13/08

Witnessed By: GDW Date: 11-13-08

Yttrium Added By: JKW Date: 11/14/08

Witnessed By: PBC Date: 11/14/08

Tracer/Carrier Solution Information					
Soln #	Nuclide	SolnID	Prep Conc	Units	Pipet ID
T1	YTTRIUM	247972	9,003.596	ppm	RS-006
T2	BARIUM	247973	16,023.752	pCi/ml	RS-015

Spike Solution Information					
Soln #	Nuclide	SolnID	Prep Conc	Units	Pipet ID
S1	Ra-228	784.3020.38	53.577	DPM/ml	RS-006

T2 exp: 11/14/09

T1 exp: 10/16/09

Int. 26.1

Final 55.1

exp: 5/28/09

38
PROJECT

784.3020.38 Ra-228

Notebook No. _____

Continued From Page _____

Prepare approx 1L of Ra-228 at a working dilution of approx. 50 dpm/mL in 0.1 M HCl (TruChe Lot 060506)

1) Determine density of 0.1 M HCl

Mass of 100 mL "class A" flask = 62.4713 g
flask + 0.1 M HCl = 162.3059 g
Net mass of 100 mL 0.1 M HCl = 99.8346 g
Density = 0.9983 g/mL

2) Transfer approx 2 mL 784.3020.37 to 1L Nalgene bottle.

Mass of bottle w/ lid = 75.0497 g
bottle + std = 77.5897 g
Net mass of std = 2.5200 g

3) Dilute w/ 0.1 M HCl

Mass of bottle w/ lid (from above) = 75.0497 g
bottle + diluted std = 1073.4 g
998.4 g

4) Final Activity Calc.

$(33,589.8 \text{ dpm/g}) (2.5200 \text{ g}) (0.9983 \text{ g/mL}) = 84.6378 \text{ dpm/mL}$
(998.4 g)

Std ID: 784.3020.38

RG 8/24/06

RG 8/24/06

Description: Ra-228

Expiration: 6/27/07

Activity: 84.64 dpm/mL

2s Uncertainty: 2.82 dpm/mL

Ref. Date: 1/28/05

Ref Time: N/A

Prep Date: 5/30/06 Prep by: DCB

Matrix/Comp. 0.1M HNO₃

Half Life (y): 5.75E+00

RG 8/24/06

Reverification Log

Analysis Date	Initials	Expiration Date
---------------	----------	-----------------

5/28/08	MBC	5/28/09

ANALYTICS

1300 Seaboard Ind Blvd • Atlanta, GA 30318 • USA • 404-352-8877

Ra-228

SRS 70005-307 Qty 6.24E-1 µCi QA

Date 01/28/05 12:00 EST Exp. XXXXXX

PO # 71239, Item 2

5.00994 grams 0.1M HCl solution

CAUTION RADIOACTIVE MATERIAL

Re 8/24/06

Continued on Page _____

[Signature]

5/30/06

Read and Understood By

[Signature]

8/24/06

Signed

Date

Signed

Date

Prepare a primary dilution of (Analytes SRS 70085-307)
 RSO # 784 by diluting contents to approx 40g
 w/ 0.1 M HCl in a 40 ml VOA vial.

1) Prepare 2L 0.1 M HCl by diluting 83 ml conc. HCl, Fischer
 lot # 060506, in 2L DI water.

2) Transfer contents of ampoule to 40 ml VOA vial.
 Mass of VOA vial w/ lid = 24.9925g (Bal 12)
 vial + STD 784 = 29.7652g
 net std transferal = 4.7727g

3) Dilute w/ 0.1 M HCl

Mass of vial (from above) = 24.9925g
 vial + std + 0.1 M HCl = 64.2671g (Bal 12)
 net mass of std = 39.2746g

4) Final Activity Calc.

$$\frac{(2.308 \times 10^4 \text{ dps}) (60 \frac{\text{min}}{\text{hr}}) (4.7727 \text{ g})}{(5.00994 \text{ g}) (39.2746 \text{ g})} = 33,589.8 \frac{\text{dps}}{\text{g}}$$

Continued on Page _____

Read and Understood By



Signed

5/30/06

Date



Signed

8/24/06

Date



ANALYTICS

RSO # 784
Recd 2/2/05
JCS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 - U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

70035-307 -

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked with a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	2.308 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	January 28, 2005 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities: γ -impurities (other than decay products) <0.1%

5.00994 grams 0.1M HCl solution with 25 μ g/g Ba carrier.

P O NUMBER 71239, Item 2

SOURCE PREPARED BY:

M. Dimitrova
M. Dimitrova, Radiochemist

Q A APPROVED:

WM [signature] 2-1-05

Radiochemistry Solution Report

Solution Id: 247972	Name: Yttrium Carrier<7>	Lot:	Vendor Name:	Type: IS
---------------------	--------------------------	------	--------------	----------

Final Vol: 1000	Dept: RS	Prep By: MOC	on	10/15/2008	Reviewed By: JRK	on	10/16/2008
Units: mL	Location: SR/RA	Opened By:	on		Verified By: MOC	on	10/16/2008
Matrix: LIQUID	ExpireDate: 10/16/2009	Received By:	on		Deactivated By:	on	

Comment:

Component Name	Component ID	Volume Added	Units
Yttrium Oxide<1>	FA991208	11.4335	g

Calibrated Primary Calibration Reference

CompName	Act/Conc	Date	1/2 Life (Yrs)	Final Act/Conc	Summed Conc	Units
YTTRIUM	787475	11/24/2008		9003.596		pCi/ml

Associated Parent IDs

FA991208

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered. (Print) = Secular equilibrium; parent half life used to calculate concentration.
NE = Not Entered

Date Printed: Monday, November 24, 2008

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Paragon Analytics

Standards DB Version: 1.091

Radiochemistry Solution Report

Solution Id: 247973	Name: Barium Carrier (BaCl ₂ in DI and HNO ₃)<20>	Type: IR
Lot:	Vendor Name:	

Final Vol: 1000	Dept: RS	Prep By	MOC	on	11/4/2008	Reviewed By	td	on	11/4/2008
Units: mL	Location: SR/RA	Opened By		on		Verified By		on	
Matrix: WATER	ExpireDate: 11/4/2009	Received By		on		Deactivated By		on	

Comment:

Component Name	Component ID	Volume Added	Units
BARIUM CHLORIDE<2>	3756B07592	28.5022	g

Calibrated Primary Calibration Reference

CompName	Act/Conc	Date	1/2 Life (Yrs)	Final Act/Conc	Summed Conc	Units
BARIUM	562193.5	11/24/2008		16023.75		pCi/ml

Associated Parent IDs

3756B07592

Abbreviations: NC = Not Calculated for reagents when the volume added is not entered.
NE = Not Entered

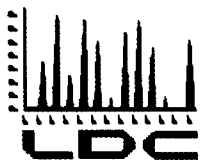
(Print) = Secular equilibrium; parent half life used to calculate concentration.

Date Printed: Monday, November 24, 2008

Paragon Analytics

A Division of Datachem Laboratories

Standards DB Version: 1.091



Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web www.lab-data.com

Fax 760.634.0439

URS Corporation
8181 East Tufts Avenue
Denver, CO 80237
ATTN: Mr. Richard Henry

December 17, 2012

SUBJECT: Sierrita VRP, Data Validation

Dear Mr. Henry,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 12, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 28908:

SDG #

Fraction

0812177 & 0905205	Radium-226, Radium-228, Gamma Spectroscopy, Isotopic Uranium, Gross Alpha Beta
-------------------	--

The data validation was performed under EPA Level IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- Addendum to Sampling & Analysis Plan, SAP, & Quality Assurance Project Plan, QAPP, Voluntary Remediation Program, VRP, Freeport-McMoran Sierrita, Inc., Green Valley Arizona, September 2008
- Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual, July 2004
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Andrew Kong
Project Manager

LDC #28908 (URS Corporation-Denver, CO / Sierrita VRP)

[illegible]

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Sierrita VRP
Collection Date: July 16 through July 28, 2008
LDC Report Date: December 14, 2012
Matrix: Soil
Parameters: Radium 226
Validation Level: EPA Level IV
Laboratory: ALS Environmental
Sample Delivery Group (SDG): 0812177

Sample Identification

CP-SD-01-0-1.5
CP-SD-02-1.5-3.0
CP-SD-05-1.5-3.0
CP-SD-03-0-1.5
CP-P07-1-3
CP-P07-0-1
CP-P07-5-7
CP-SD-04-0-1.5
CP-SD-04-1.5-3.0
CP-SD-09-0-1.5
CD-SD-09-1.5-3.0
CP-P12-1-3
OD-SD-02-0-1.5
CP-SD-01-0-1.5DUP

Introduction

This data review covers 14 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 903.1 for Radium 226.

This review follows the Addendum to Sampling & Analyses Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoran Sierrita, Inc., Green Valley Arizona (September 2008), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the isotope was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the isotope was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

Detector efficiency was determined for each radionuclide of interest.

III. Continuing Calibration

Continuing calibration and background determination was performed at the required frequencies.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. Blank results contained less than the minimum detectable activity (MDA).

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

A matrix spike (MS) analysis was not required by the method.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Minimum Detectable Activity (MDA)

All minimum detectable activities met required detection limits.

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

Sierrita VRP
Radium 226 - Data Qualification Summary - SDG 0812177

No Sample Data Qualified in this SDG

Sierrita VRP
Radium 226 - Laboratory Blank Data Qualification Summary - SDG 0812177

No Sample Data Qualified in this SDG

Sierrita VRP
Radium 226 - Field Blank Data Qualification Summary - SDG 0812177

No Sample Data Qualified in this SDG

METHOD: Radium 226 (EPA Method 903.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 7/16-28/08
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N/A	MS: not required, Dup
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery		
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Soil

1	CP-SD-01-0-1.5	11	CD-SD-09-1.5-3.0	21		31	
2	CP-SD-02-1.5-3.0	12	CP-P12-1-3	22		32	
3	CP-SD-05-1.5-3.0	13	OD-SD-02-0-1.5	23		33	
4	CP-SD-03-0-1.5	14	CP-SD-01-0-1.5DUP	24		34	
5	CP-P07-1-3	15		25		35	
6	CP-P07-0-1	16		26		36	
7	CP-P07-5-7	17		27		37	
8	CP-SD-04-0-1.5	18		28		38	
9	CP-SD-04-1.5-3.0	19		29		39	
10	CP-SD-09-0-1.5	20		30		40	

Notes: _____

Method: Radiochemistry(EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.			✓	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) <1.42?	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?			✓	
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

All circled dates have exceeded the technical holding times.

Y) N N/A Were all cooler temperatures within validation criteria?

[illegible]

TECHNICAL HOLDING TIME CRITERIA

Soil: 6 months or 5 half lives
Water: 6 months or 5 half lives

LDC #: 28708129

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated		Reported		Acceptable (Y/N)
					%R or RPD	%R or RPD			
LOS	Laboratory control sample	Re-226	47.5	44.6	107		107		Y
	Matrix spike sample								
14	Duplicate RPD Dea	Re-226	2.1 2σ=2061	1.8 2σ=0.5	0.38		0.32		Y
	Chemical recovery								

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 28906119

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: 1 of 1Reviewer: OR2nd reviewer: hMETHOD: Radiochemistry (Method: See cover)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?

Y N N/A Are results within the calibrated range of the instruments?

Analyte results for Ra-226 reported with a positive detect were recalculated and verified using the following equation:

Concentration =

Recalculation:

$$\frac{(\text{cpm} - \text{background})}{2.22 \times E \times SA \times \text{Vol}}$$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

see below

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	I	Ra-226	2.1	2.0	Y
		$\frac{(97-10)}{15 \text{ min}} \times \frac{1}{2.22(1.5166)(1.01 \text{ g})} \times \frac{1}{1-e^{-0.181(10.9)}} \times \frac{1}{e^{-0.00755(4.78)}} \times \frac{0.000126(15)}{1-e^{-0.000126(15)}} = 2.048 \text{ pCi/g}$			
18	II	Ra-226	1.6	1.6	Y
		$\frac{(69-8)}{15 \text{ min}} \times \frac{1}{2.22(1.3444)(1.01 \text{ g})} \times \frac{1}{1-e^{-0.181(10.9)}} \times \frac{1}{e^{-0.00755(4.78)}} \times \frac{0.000126(15)}{1-e^{-0.000126(15)}} = 1.62 \text{ pCi/g}$			

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Sierrita VRP
Collection Date: July 17, 2008
LDC Report Date: December 14, 2012
Matrix: Soil
Parameters: Radium 228
Validation Level: EPA Level IV
Laboratory: ALS Environmental

Sample Delivery Group (SDG): 0812177

Sample Identification

CP-P07-5-7

Introduction

This data review covers one soil sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ALS SOP 724 Rev 10 for Radium 228.

This review follows the Addendum to Sampling & Analyses Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoran Sierrita, Inc., Green Valley Arizona (September 2008), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the isotope was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the isotope was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

Detector efficiency was determined for each radionuclide of interest.

III. Continuing Calibration

Continuing calibration and background determination was performed at the required frequencies.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. Blank results contained less than the minimum detectable activity (MDA).

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

A matrix spike (MS) analysis was not required by the method.

Duplicate (DUP) sample analyses were not required by the method.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Carrier Recovery

All carrier recoveries were within validation criteria.

VIII. Minimum Detectable Activity (MDA)

All minimum detectable activities met required detection limits.

IX. Sample Result Verification

All sample result verifications were acceptable.

IX. Sample Result Verification

All sample result verifications were acceptable.

X. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XI. Field Duplicates

No field duplicates were identified in this SDG.

**Sierrita VRP
Radium 228 - Data Qualification Summary - SDG 0812177**

No Sample Data Qualified in this SDG

**Sierrita VRP
Radium 228 - Laboratory Blank Data Qualification Summary - SDG 0812177**

No Sample Data Qualified in this SDG

**Sierrita VRP
Radium 228 - Field Blank Data Qualification Summary - SDG 0812177**

No Sample Data Qualified in this SDG

LDC #: 28908A29b

VALIDATION COMPLETENESS WORKSHEET

SDG #: 0812177

Level IV

Laboratory: ALS Environmental

Date: 12-13-12

Page: 1 of 1

Reviewer: AL2nd Reviewer: W**METHOD:** Radium 228 (ALS SOP PA-724 R10)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 7/17/08
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N/N	Not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Soil

1	CP-P07-5-7	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		/		
II. Calibration				
Were all instruments and detectors calibration as required?	/			
Were NIST traceable standards used for all calibrations?	/			
Was the check source identified by activity and radionuclide?	/			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	/			
III. Blanks				
Were blank analyses performed as required?	/			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.		/		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?		/		
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?			/	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	/			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	/			
Were tracer/carrier recoveries within the QC limits?	/			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		/		
Were the performance evaluation (PE) samples within the acceptance limits?			/	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were the Minimum Detectable Activities (MDA) $< RL$?	/			

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

LDC #: 28908A29b

VALIDATION FINDINGS WORKSHEET

Technical Holding Times

Page: 1 of 1

Reviewer: a

2nd Reviewer: 5

All circled dates have exceeded the technical holding times.

Y N N/A Were all cooler temperatures within validation criteria?

METHOD: Radiochemistry (Method: see card)

[illegible]

TECHNICAL HOLDING TIME CRITERIA

Soil: 6 months or 5 half lives

Water: 6 months or 5 half lives

LDC #: 282084296

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: CR
2nd Reviewer: h

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated		Reported		Acceptable (Y/N)
					%R or RPD	%R or RPD			
LC5	Laboratory control sample	Ba-228	45.0	46.5	96.8		96.7		Y
N	Matrix spike sample								
N	Duplicate RPD								
1	Chemical recovery	Ba Y	32900 5480	35220 8713	93.4 $\bar{x} = 58.8$ 62.9		93.4 $\bar{x} = 58.7$ 62.9		Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.


LDC #: 00406A(4)

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: CR

2nd reviewer: 

METHOD: Radiochemistry (Method: See cover)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y	N	N/A
Y	N	N/A

Have results been reported and calculated correctly?

Are results within the calibrated range of the instruments?

Analyte results for Ra-228 reported with a positive detect were recalculated and verified using the following equation:

Concentration =

Recalculation:

$$\frac{(\text{cpm} - \text{background})}{2.22 \times E \times SA \times Vol}$$

$$\frac{2.6 - 2.06}{2.22(0.4168)(0.5085)(0.587)} \times 1.695 = 3.31 \text{ pCi/l}$$

E = Counter Efficiency

SA = Self-absorbance factor

Vol = Volume of sample

[illegible]

note: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Sierrita VRP
Collection Date: July 16 through July 28, 2008
LDC Report Date: December 14, 2012
Matrix: Soil
Parameters: Gamma Spectroscopy
Validation Level: EPA Level IV
Laboratory: ALS Environmental
Sample Delivery Group (SDG): 0812177

Sample Identification

CP-SD-01-0-1.5 CP-P12-1-3DUP
CP-SD-01-1.5-3.0
CP-SD-02-0-1.5
CP-SD-02-1.5-3.0
CP-SD-06-0-1.5
CP-SD-06-1.5-3.0
CP-SD-05-0-1.5
CP-SD-05-1.5-3.0
CP-SD-03-0-1.5
CP-SD-03-1.5-3.0
CP-P07-1-3
CP-P07-0-1
CP-SD-04-0-1.5
CP-SD-04-1.5-3.0
CP-Q09-1-3
CP-SD-09-0-1.5
CD-SD-09-1.5-3.0
CP-P12-1-3
OD-SD-02-0-1.5
CP-SD-01-1.5-3.0DUP

Introduction

This data review covers 21 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ALS SOP 713 Rev 10 for Gamma Spectroscopy.

This review follows the Addendum to Sampling & Analyses Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoran Sierrita, Inc., Green Valley Arizona (September 2008), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the isotope was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the isotope was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

Detector efficiency was determined for each radionuclide of interest.

III. Continuing Calibration

Continuing calibration and background determination was performed at the required frequencies with the following exceptions:

Sample	Isotope	Finding	Criteria	Flag	A or P
CP-SD-01-1.5-3.0 CP-SD-02-0-1.5 CP-SD-06-0-1.5 CP-SD-06-1.5-3.0 CP-SD-05-0-1.5 CP-SD-03-1.5-3.0 CP-Q09-1-3 CP-SD-01-1.5-3.0DUP	Radium-226	A mixed gamma source was used for calibration.	The laboratory should use a NIST certified Radium-226 source in the same geometry and configuration as the samples.	J (all detects) UJ (all non-detects)	A

Calibration results were within control limits with the following exceptions:

Date	Lab. Reference/ID	Isotope	% (Limits)	Associated Samples	Flag	A or P
1/13/09	Observed dead time	All isotopes	10.63 (≤ 10)	GS090106-3LCS	J (all detects) UJ (all non-detects)	P

IV. Blanks

Method blanks were reviewed for each matrix as applicable. Blank results contained less than the minimum detectable activity (MDA).

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

A matrix spike (MS) analysis was not required by the method.

VI. Duplicate

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Minimum Detectable Activity

All minimum detectable activities met required detection limits with the following exceptions:

Sample	Isotope	Requested MDC	Lab MDC
CP-P07-1-3	Radium-228	1.0 pCi/g	1.3 pCi/g
CP-SD-04-0-1.5	Radium-228	1.0 pCi/g	1.6 pCi/g
CP-SD-04-1.5-3.0	Radium-228	1.0 pCi/g	1.5 pCi/g

The Lab MDC was greater than the Requested MDC as listed above.

IX. Sample Result Verification

All sample result verifications were acceptable with the following exceptions:

Sample	Isotope	Finding	Criteria	Flag	A or P
CP-SD-02-0-1.5 CP-SD-03-0-1.5 CP-SD-03-1.5-3.0 CP-SD-04-1.5-3.0 CP-Q09-1-3	Radium-228	Tentative identification requirements were not met.	Tentative identification must meet at least one of two requirements: peak identified above critical level or minimum library peak abundance attained.	J (all detects) UJ (all non-detects)	A
CP-P07-1-3 CP-P07-0-1 CP-SD-04-1.5-3.0 CP-P12-1-3	All isotopes	Greater than 15% density between the calibration standard and the sample.	Density should be $\leq 15\%$ between the calibration standard and the sample.	J (all detects)	A

X. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XI. Field Duplicates

No field duplicates were identified in this SDG.

Sierrita VRP**Gamma Spectroscopy - Data Qualification Summary - SDG 0812177**

SDG	Sample	Isotope	Flag	A or P	ADQ	Reason
0812177	CP-SD-01-1.5-3.0 CP-SD-02-0-1.5 CP-SD-06-0-1.5 CP-SD-06-1.5-3.0 CP-SD-05-0-1.5 CP-SD-03-1.5-3.0 CP-Q09-1-3	Radium-226	J (all detects) UJ (all non-detects)	A	N1	Calibration Verification (mixed gamma source)
0812177	CP-SD-02-0-1.5 CP-SD-03-0-1.5 CP-SD-03-1.5-3.0 CP-SD-04-1.5-3.0 CP-Q09-1-3	Radium-228	J (all detects) UJ (all non-detects)	A	N1	Sample result verification (tentative identifications)
0812177	CP-P07-1-3 CP-P07-0-1 CP-SD-04-1.5-3.0 CP-P12-1-3	All isotopes	J (all detects)	A	N1	Sample result verification (density difference)

Sierrita VRP**Gamma Spectroscopy - Laboratory Blank Data Qualification Summary - SDG 0812177**

No Sample Data Qualified in this SDG

Sierrita VRP**Gamma Spectroscopy - Field Blank Data Qualification Summary - SDG 0812177**

No Sample Data Qualified in this SDG

LDC #: 28908A35
 SDG #: 0812177
 Laboratory: ALS Environmental

VALIDATION COMPLETENESS WORKSHEET Level IV

Date: 12-13-12
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: Gamma Spectroscopy (ALS SOP PAI 713 Rev 10)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 7/16-28/08
II.	Initial calibration	A	
III.	Calibration verification	SW	
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N/A	MS: not required for Dup
VI.	Duplicate	A	DR
VII.	Laboratory control samples	A	LES
VIII.	Minimum detectable activity (MDA)	SW	
IX.	Sample result verification	SW	
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	N	

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

1	CP-SD-01-0-1.5	11	CP-P07-1-3	21	CP-P12-1-3DUP	31	
2	CP-SD-01-1.5-3.0	12	CP-P07-0-1	22		32	
3	CP-SD-02-0-1.5	13	CP-SD-04-0-1.5	23		33	
4	CP-SD-02-1.5-3.0	14	CP-SD-04-1.5-3.0	24		34	
5	CP-SD-06-0-1.5	15	CP-Q09-1-3	25		35	
6	CP-SD-06-1.5-3.0	16	CP-SD-09-0-1.5	26		36	
7	CP-SD-05-0-1.5	17	CD-SD-09-1.5-3.0	27		37	
8	CP-SD-05-1.5-3.0	18	CP-P12-1-3	28		38	
9	CP-SD-03-0-1.5	19	OD-SD-02-0-1.5	29		39	
10	CP-SD-03-1.5-3.0	20	CP-SD-01-1.5-3.0DUP	30		40	

Notes:

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all instruments and detectors calibration as required?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the Minimum Detectable Activities (MDA) $< RL$?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		/		
Target analytes were detected in the field duplicates.			/	
XI. Field blanks				
Field blanks were identified in this SDG.		/		
Target analytes were detected in the field blanks.			/	

glee

Were all instruments and detectors calibrated as required?

☒ Y ☐ N ☐ N/A

Were NIST traceable standards used for all calibrations?

Was the check source identified by activity and radionuclide?

Were check sources including background counts analyzed a

[illegible]

Comments:

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

[illegible]

Comments:

METHOD: Radiochemistry (Method: Secar)

[illegible]

Comments:

LDC #: 2822573

VALIDATION FINDINGS WORKSHEET

Level IV Recalculation Worksheet

Page: 1 of 1Reviewer: CR2nd Reviewer: faMETHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where,

Found = activity of each analyte measured in the analysis of the sample.

True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where,

S = Original sample activity

D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated		Reported		Acceptable (Y/N)
					%R or RPD	%R or RPD	%R or RPD	%R or RPD	
LCS	Laboratory control sample	Am-241	1020	986	103		103		Y
N	Matrix spike sample								
20	Duplicate RPD 0.22	Pa-226	22 20=0.39	23 20=0.41	0.18		0.23		Y
N	Chemical recovery								

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

lote: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Sierrita VRP
Collection Date: July 16 through July 28, 2008
LDC Report Date: December 14, 2012
Matrix: Soil
Parameters: Isotopic Uranium
Validation Level: EPA Level IV
Laboratory: ALS Environmental

Sample Delivery Group (SDG): 0812177

Sample Identification

CP-SD-01-0-1.5	CP-SD-01-1.5-3.0DUP
CP-SD-01-1.5-3.0	CP-SD-09-0-1.5DUP
CP-SD-02-0-1.5	
CP-SD-02-1.5-3.0	
CP-SD-06-0-1.5	
CP-SD-06-1.5-3.0	
CP-SD-05-0-1.5	
CP-SD-05-1.5-3.0	
CP-SD-03-0-1.5	
CP-SD-03-1.5-3.0	
CP-P07-1-3	
CP-P07-0-1	
CP-P07-5-7	
CP-SD-04-0-1.5	
CP-SD-04-1.5-3.0	
CP-Q09-1-3	
CP-SD-09-0-1.5	
CD-SD-09-1.5-3.0	
CP-P12-1-3	
OD-SD-02-0-1.5	

Introduction

This data review covers 22 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ALS SOP 714 Rev 11 for Isotopic Uranium.

This review follows the Addendum to Sampling & Analyses Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoran Sierrita, Inc., Green Valley Arizona (September 2008), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the isotope was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the isotope was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

Detector efficiency was determined for each radionuclide of interest.

III. Continuing Calibration

Continuing calibration and background determination was performed at the required frequencies.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. Blank results contained less than the minimum detectable activity (MDA).

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

A matrix spike (MS) analysis was not required by the method.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Tracer Recovery

All tracer recoveries were within validation criteria.

VIII. Minimum Detectable Activity

All minimum detectable activities met required detection limits with the following exceptions:

Sample	Isotope	Requested MDC	Lab MDC
CP-SD-05-1.5-3.0	Uranium-238	0.1 pCi/g	0.11 pCi/g
CP-SD-03-1.5-3.0	Uranium-234	0.1 pCi/g	0.13 pCi/g
CP-P07-0-1	Uranium-234	0.1 pCi/g	0.11 pCi/g
CP-P07-5-7	Uranium-238	0.1 pCi/g	0.11 pCi/g
OD-SD-02-0-1.5	Uranium-234	0.1 pCi/g	0.16 pCi/g

The Lab MDC was greater than the Requested MDC as listed above.

IX. Sample Result Verification

All sample result verifications were acceptable.

X. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XI. Field Duplicates

No field duplicates were identified in this SDG.

Sierrita VRP

Isotopic Uranium - Data Qualification Summary - SDG 0812177

No Sample Data Qualified in this SDG

Sierrita VRP

Isotopic Uranium - Laboratory Blank Data Qualification Summary - SDG 0812177

No Sample Data Qualified in this SDG

Sierrita VRP

Isotopic Uranium - Field Blank Data Qualification Summary - SDG 0812177

No Sample Data Qualified in this SDG

LDC #: 28908A59

VALIDATION COMPLETENESS WORKSHEET

SDG #: 0812177

Level IV

Laboratory: ALS Environmental

Date: 12-13-12

Page: 1 of 1

Reviewer: *AL*2nd Reviewer: *✓***METHOD:** Isotopic Uranium (ALS SOP PAI 714 Rev 11)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 7/16-28/08
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	MA	MS: not required, Dp
VI.	Laboratory control samples	A	LCS
VII.	Tracer Recovery	A	
VIII.	Minimum Detectable Activity (MDA)	SW	
IX.	Sample result verification	A	
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Soil

1	CP-SD-01-0-1.5	11	CP-P07-1-3	21	CP-SD-01-1.5-3.0DUP	31	
2	CP-SD-01-1.5-3.0	12	CP-P07-0-1	22	CP-SD-09-0-1.5DUP	32	
3	CP-SD-02-0-1.5	13	CP-P07-5-7	23		33	
4	CP-SD-02-1.5-3.0	14	CP-SD-04-0-1.5	24		34	
5	CP-SD-06-0-1.5	15	CP-SD-04-1.5-3.0	25		35	
6	CP-SD-06-1.5-3.0	16	CP-Q09-1-3	26		36	
7	CP-SD-05-0-1.5	17	CP-SD-09-0-1.5	27		37	
8	CP-SD-05-1.5-3.0	18	CD-SD-09-1.5-3.0	28		38	
9	CP-SD-03-0-1.5	19	CP-P12-1-3	29		39	
10	CP-SD-03-1.5-3.0	20	OD-SD-02-0-1.5	30		40	

Notes: _____

Method: Radiochemistry (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		/		
II. Calibration				
Were all instruments and detectors calibration as required?	/			
Were NIST traceable standards used for all calibrations?	/			
Was the check source identified by activity and radionuclide?	/			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	/			
III. Blanks				
Were blank analyses performed as required?	/			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		/		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.		/		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			/	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	/			
Were all duplicate sample duplicate error ratios (DER) <1.42?	/			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	/			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	/			
Were tracer/carrier recoveries within the QC limits?	/			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		/		
Were the performance evaluation (PE) samples within the acceptance limits?		/		
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were the Minimum Detectable Activities (MDA) < RL?	/			

DC #: 28908159

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: CR
2nd Reviewer: W

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET

Technical Holding Times

Reviewer: A

2nd Reviewer: _____

All circled dates have exceeded the technical holding times.

Y N N/A Were all cooler temperatures within validation criteria? see

[illegible]

TECHNICAL HOLDING TIME CRITERIA

Soil: 6 months or 5 half lives

Water: 6 months or 5 half lives

The following sample MDAs are above the RDL:

[illegible]

28908A59MDA.wpd

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation WorksheetMETHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated		Acceptable (Y/N)
					%R or RPD	Reported %R or RPD	
LC3	Laboratory control sample	U-238	5.33	5.23	102	102	Y
N	Matrix spike sample						
21	Duplicate RPD	U-238	2.12 $2\sigma = 0.42$	2.13 $2\sigma = 0.44$	0.16	0.25	Y
1	Chemical recovery	U-238	3.58	4.418	81	81	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

METHOD: Radiochemistry (Method: See cover)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y	N	N/A
Y	N	N/A

Have results been reported and calculated correctly?

Are results within the calibrated range of the instruments?

Analyte results for U-234/238 reported with a positive defect were recalculated and verified using the following equation: 26.71

Concentration =

U-234: 1 = $\frac{265.7}{2.22(0.3107)(0.8226)(300 \text{ min})(1g)} = 1.56 \text{ pCi/g}$

$$\frac{(\text{cpm} - \text{background})}{2.22 \times E \times SA \times Vol}$$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

$$U-238 = 11.2 \frac{211.1}{2.22(1.002)(0.2813)(0.8663)(300 \text{ min})(0.59)} = 2.516 \text{ pCi/g}$$

[illegible]

Note:

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Sierrita VRP

Collection Date: August 1 through September 1, 2008

LDC Report Date: December 14, 2012

Matrix: Soil

Parameters: Gross Alpha & Beta

Validation Level: EPA Level IV

Laboratory: ALS Environmental

Sample Delivery Group (SDG): 0905205

Sample Identification

MW-2008-14-2-63	MW-2008-15-2C-30
MW-2008-14-Calcite-48	MW-2008-15-3F-40
MW-2008-14-3-124	MW-2008-15-3C-42
MW-2008-14-4-159	MW-2008-15-4F-52
MW-2008-12-1F-13	MW-2008-15-4C-55
MW-2008-12-1C-22	MW-2008-13-2F-37MS
MW-2008-12-1F-ORG	MW-2008-13-2F-37DUP
MW-2008-12-2F-39	MW-2008-15-1F-4DUP
MW-2008-12-2C-40	
MW-2008-12-3F-58	
MW-2008-12-3C-63	
MW-2008-13-2C-28	
MW-2008-13-2F-37	
MW-2008-13-3C-51	
MW-2008-13-3F-52	
MW-2008-13-4F-58	
MW-2008-13-4C-69	
MW-2008-15-1F-4	
MW-2008-15-1C-16	
MW-2008-15-2F-29	

Introduction

This data review covers 28 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ALS SOP 724 Rev 10 for Gross Alpha and Beta Radioactivity.

This review follows the Addendum to Sampling & Analyses Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoran Sierrita, Inc., Green Valley Arizona (September 2008), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Isotope	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
MW-2008-14-2-63 MW-2008-14-4-Calcite-48 MW-2008-14-3-124 MW-2008-14-4-159 MW-2008-15-1F-4 MW-2008-15-1C-16 MW-2008-15-2F-29 MW-2008-15-2C-30 MW-2008-15-3F-40 MW-2008-15-3C-42 MW-2008-15-4F-52 MW-2008-15-4C-55 MW-2008-15-1F-4DUP	Gross alpha Gross beta	406 days	6 months	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	P
MW-2008-12-1F-13 MW-2008-12-1C-22 MW-2008-12-1F-ORG MW-2008-12-2F-39 MW-2008-12-2C-40 MW-2008-12-3F-58 MW-2008-12-3C-63 MW-2008-13-2C-28 MW-2008-13-2F-37 MW-2008-13-3C-51 MW-2008-13-3F-52 MW-2008-13-4F-58 MW-2008-13-4C-69 MW-2008-13-2F-37MS MW-2008-13-2F-37DUP	Gross alpha Gross beta	372 days	6 months	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

Detector efficiency was determined and a self-absorption curve was generated for each radionuclide of interest.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. Blank results contained less than the minimum detectable activity (MDA).

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Minimum Detectable Activity (MDA)

All minimum detectable activities met required detection limits.

VIII. Sample Result Verification

All sample result verifications were acceptable.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

Sierrita VRP

Gross Alpha & Beta - Data Qualification Summary - SDG 0905205

SDG	Sample	Isotope	Flag	A or P	ADQ	Reason
0905205	MW-2008-14-2-63	Gross alpha	J (all detects)	P	H1	Technical holding times
	MW-2008-14-Calcite-48		R (all non-detects)			
	MW-2008-14-3-124	Gross beta	J (all detects)			
	MW-2008-14-4-159		R (all non-detects)			
	MW-2008-15-1F-4					
	MW-2008-15-1C-16					
	MW-2008-15-2F-29					
	MW-2008-15-2C-30					
	MW-2008-15-3F-40					
	MW-2008-15-3C-42					
	MW-2008-15-4F-52					
	MW-2008-15-4C-55					
	MW-2008-12-1F-13					
	MW-2008-12-1C-22					
	MW-2008-12-1F-ORG					
	MW-2008-12-2F-39					
	MW-2008-12-2C-40					
	MW-2008-12-3F-58					
	MW-2008-12-3C-63					
	MW-2008-13-2C-28					
	MW-2008-13-2F-37					
	MW-2008-13-3C-51					
	MW-2008-13-3F-52					
	MW-2008-13-4F-58					
	MW-2008-13-4C-69					

Sierrita VRP

Gross Alpha & Beta - Laboratory Blank Data Qualification Summary - SDG 0905205

No Sample Data Qualified in this SDG

Sierrita VRP

Gross Alpha & Beta - Field Blank Data Qualification Summary - SDG 0905205

No Sample Data Qualified in this SDG

LDC #: 28908B22

VALIDATION COMPLETENESS WORKSHEET

Date: 12-13-12

SDG #: 0905205

Level IV

Page: 1 of 1

Laboratory: ALS Environmental

Reviewer: on2nd Reviewer: W

ALS SOP 724 Rev 10
METHOD: Gross Alpha & Beta (EPA SW846 Method 9340)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/1 - 9/1/08
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	MS / DLP
VI.	Laboratory control samples	A	LES
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks	N	

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

Soil

1	MW-2008-14-2-63	11	MW-2008-12-3C-63	21	MW-2008-15-2C-30	31	
2	MW-2008-14-Calcite-48	12	MW-2008-13-2C-28	22	MW-2008-15-3F-40	32	
3	MW-2008-14-3-124	13	MW-2008-13-2F-37	23	MW-2008-15-3C-42	33	
4	MW-2008-14-4-159	14	MW-2008-13-3C-51	24	MW-2008-15-4F-52	34	
5	MW-2008-12-1F-13	15	MW-2008-13-3F-52	25	MW-2008-15-4C-55	35	
6	MW-2008-12-1C-22	16	MW-2008-13-4F-58	26 ¹³	MW-2008-13-2F-37MS	36	
7	MW-2008-12-1F-ORG	17	MW-2008-13-4C-69	27 ¹³	MW-2008-13-2F-37DUP	37	
8	MW-2008-12-2F-39	18	MW-2008-15-1F-4	28 ¹⁸	MW-2008-15-1F-4DUP	38	
9	MW-2008-12-2C-40	19	MW-2008-15-1C-16	29		39	
10	MW-2008-12-3F-58	20	MW-2008-15-2F-29	30		40	

Notes: _____

Method: Radiochemistry (EPA Method See Cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
II. Calibration				
Were all instruments and detectors calibration as required?	<input checked="" type="checkbox"/>			
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>			
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>			
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		<input checked="" type="checkbox"/>		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<input checked="" type="checkbox"/>			
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input checked="" type="checkbox"/>			
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input checked="" type="checkbox"/>			
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input checked="" type="checkbox"/>			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	<input checked="" type="checkbox"/>			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?			<input checked="" type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?			<input checked="" type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		<input checked="" type="checkbox"/>		
Were the performance evaluation (PE) samples within the acceptance limits?			<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>			
Were the Minimum Detectable Activities (MDA) $< RL$?	<input checked="" type="checkbox"/>			

DC #: 08908B00

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: CR
2nd Reviewer: ✓

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

LDC #: 2808022

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: CR
2nd Reviewer: N

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated		Acceptable (Y/N)
					%R or RPD	Reported %R or RPD	
LCS	Laboratory control sample	Grossd	13.4	13.1	88.7	87.3	Y
26	Matrix spike sample	GrossB	15.5	14.3	10.8	10.9	Y
27	Duplicate RPD	Grossd	13 20=3.1	14 20=3.1	0.11	0.04	Y
N	Chemical recovery						

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 0461081522

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: CR

2nd reviewer: 1

METHOD: Radiochemistry (Method: See cover)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

<u>Y</u>	<u>N</u>	<u>N/A</u>	Have results been reported and calculated correctly?
<u>Y</u>	<u>N</u>	<u>N/A</u>	Are results within the calibrated range of the instruments?

Y	N	N/A
Y	N	N/A

Analyte results for Gross α/β reported with a positive detect were recalculated and verified using the following equation:

Concentration =

$$1: \text{Gross } \sigma = \frac{3.667 - 0.063 - 0.013}{2.22(k)(0.2343)(0.658)} = 10.49 \text{ pci/g}$$

$$5: \text{Gross } \beta = \frac{12.7 - 1.57 - 0.9215}{2.22(1g)(0.4029)(1078)} = 10.59 \text{ pci/g}$$

$$w: \text{Grossd} = \frac{5.667 - 0.061 - 0.019}{2.2219(0.2232)(0.695)} = 16.21 \text{ pci/g}$$

E = Counter Efficiency

SA = Self-absorbance factor

Vol = Volume of sample

[illegible]

note: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Sierrita VRP
Collection Date: August 1 through September 1, 2008
LDC Report Date: December 14, 2012
Matrix: Soil
Parameters: Gamma Spectroscopy
Validation Level: EPA Level IV
Laboratory: ALS Environmental
Sample Delivery Group (SDG): 0905205

Sample Identification

MW-2008-14-2-63	MW-2008-15-2C-30
MW-2008-14-Calcite-48	MW-2008-15-3F-40
MW-2008-14-3-124	MW-2008-15-3C-42
MW-2008-14-4-159	MW-2008-15-4F-52
MW-2008-12-1F-13	MW-2008-15-4C-55
MW-2008-12-1C-22	MW-2008-14-2-63DUP
MW-2008-12-1F-ORG	MW-2008-12-2F-39DUP
MW-2008-12-2F-39	MW-2008-15-1F-4DUP
MW-2008-12-2C-40	
MW-2008-12-3F-58	
MW-2008-12-3C-63	
MW-2008-13-2C-28	
MW-2008-13-2F-37	
MW-2008-13-3C-51	
MW-2008-13-3F-52	
MW-2008-13-4F-58	
MW-2008-13-4C-69	
MW-2008-15-1F-4	
MW-2008-15-1C-16	
MW-2008-15-2F-29	

Introduction

This data review covers 28 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ALS SOP 713 Rev 10 for Gamma Spectroscopy.

This review follows the Addendum to Sampling & Analyses Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoran Sierrita, Inc., Green Valley Arizona (September 2008), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the isotope was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the isotope was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

Detector efficiency was determined for each radionuclide of interest.

III. Continuing Calibration

Continuing calibration and background determination was performed at the required frequencies with the following exceptions:

Sample	Isotope	Finding	Criteria	Flag	A or P
All samples in SDG 0905205	Radium-226	A mixed gamma source was used for calibration.	The laboratory should use a NIST certified Radium-226 source in the same geometry and configuration as the samples.	J (all detects) UJ (all non-detects)	A

Calibration results were within control limits.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. Blank results contained less than the minimum detectable activity (MDA).

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

A matrix spike (MS) analysis was not required by the method.

VI. Duplicate

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Minimum Detectable Activity

All minimum detectable activities met required detection limits with the following exceptions:

Sample	Isotope	Requested MDC	Lab MDC
MW-2008-14-2-63	Radium-228	1.0 pCi/g	1.1 pCi/g
MW-2008-13-3F-52	Radium-228	1.0 pCi/g	1.1 pCi/g
MW-2008-13-4F-58	Radium-228	1.0 pCi/g	1.3 pCi/g
MW-2008-15-1F-4DUP	Radium-228	1.0 pCi/g	1.1 pCi/g
MW-2008-15-1C-16	Radium-228	1.0 pCi/g	1.1 pCi/g

The Lab MDC was greater than the Requested MDC as listed above.

IX. Sample Result Verification

All sample result verifications were acceptable with the following exceptions:

Sample	Isotope	Finding	Criteria	Flag	A or P
MW-2008-15-4F-52	Radium-228	Tentative identification requirements were not met.	Tentative identification must meet at least one of two requirements: peak identified above critical level or minimum library peak abundance attained.	J (all detects) UJ (all non-detects)	A
MW-2008-14-2-63 MW-2008-12-1F-13 MW-2008-12-1C-22 MW-2008-12-1F-ORG MW-2008-12-2F-39 MW-2008-12-2C-40 MW-2008-12-3F-58 MW-2008-12-3C-63 MW-2008-13-4C-69 MW-2008-15-2F-29 MW-2008-15-2C-30 MW-2008-15-3F-40 MW-2008-15-3C-42 MW-2008-15-4F-52 MW-2008-15-4C-55 MW-2008-14-2-63DUP MW-2008-12-2F-39DUP	All isotopes	Greater than 15% density between the calibration standard and the sample.	Density should be $\leq 15\%$ between the calibration standard and the sample.	J (all detects)	A

X. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XI. Field Duplicates

No field duplicates were identified in this SDG.

Sierrita VRP**Gamma Spectroscopy - Data Qualification Summary - SDG 0905205**

SDG	Sample	Isotope	Flag	A or P	ADQ	Reason
0905205	MW-2008-14-2-63 MW-2008-14-Calcite-48 MW-2008-14-3-124 MW-2008-14-4-159 MW-2008-12-1F-13 MW-2008-12-1C-22 MW-2008-12-1F-ORG MW-2008-12-2F-39 MW-2008-12-2C-40 MW-2008-12-3F-58 MW-2008-12-3C-63 MW-2008-13-2C-28 MW-2008-13-2F-37 MW-2008-13-3C-51 MW-2008-13-3F-52 MW-2008-13-4F-58 MW-2008-13-4C-69 MW-2008-15-1F-4 MW-2008-15-1C-16 MW-2008-15-2F-29 MW-2008-15-2C-30 MW-2008-15-3F-40 MW-2008-15-3C-42 MW-2008-15-4F-52 MW-2008-15-4C-55	Radium-226	J (all detects) UJ (all non-detects)	A	N1	Calibration Verification (mixed gamma source)
0905205	MW-2008-15-4F-52	Radium-228	J (all detects) UJ (all non-detects)	A	N1	Sample result verification (tentative identifications)
0905205	MW-2008-14-2-63 MW-2008-12-1F-13 MW-2008-12-1C-22 MW-2008-12-1F-ORG MW-2008-12-2F-39 MW-2008-12-2C-40 MW-2008-12-3F-58 MW-2008-12-3C-63 MW-2008-13-4C-69 MW-2008-15-2F-29 MW-2008-15-2C-30 MW-2008-15-3F-40 MW-2008-15-3C-42 MW-2008-15-4F-52 MW-2008-15-4C-55	All isotopes	J (all detects)	A	N1	Sample result verification (density difference)

Sierrita VRP**Gamma Spectroscopy - Laboratory Blank Data Qualification Summary - SDG 0905205**

No Sample Data Qualified in this SDG

Sierrita VRP**Gamma Spectroscopy - Field Blank Data Qualification Summary - SDG 0905205**

No Sample Data Qualified in this SDG

LDC #: 28908B35

VALIDATION COMPLETENESS WORKSHEET

SDG #: 0905205

Level IV

Laboratory: ALS Environmental

Date: 2-13-08

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: Gamma Spectroscopy (ALS SOP PAI 713 Rev 10)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/1/08 - 9/1/08
II.	Initial calibration	A	
III.	Calibration verification	SW	
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	Not required
VI.	Duplicate	A	dup
VII.	Laboratory control samples	A	LCS
VIII.	Minimum detectable activity (MDA)	SW	
IX.	Sample result verification	SW	
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

soil

1	MW-2008-14-2-63	11	MW-2008-12-3C-63	21	MW-2008-15-2C-30	31	
2	MW-2008-14-Calcite-48	12	MW-2008-13-2C-28	22	MW-2008-15-3F-40	32	
3	MW-2008-14-3-124	13	MW-2008-13-2F-37	23	MW-2008-15-3C-42	33	
4	MW-2008-14-4-159	14	MW-2008-13-3C-51	24	MW-2008-15-4F-52	34	
5	MW-2008-12-1F-13	15	MW-2008-13-3F-52	25	MW-2008-15-4C-55	35	
6	MW-2008-12-1C-22	16	MW-2008-13-4F-58	26	MW-2008-14-2-63DUP	36	
7	MW-2008-12-1F-ORG	17	MW-2008-13-4C-69	27	MW-2008-12-2F-39DUP	37	
8	MW-2008-12-2F-39	18	MW-2008-15-1F-4	28	MW-2008-15-1F-4DUP	38	
9	MW-2008-12-2C-40	19	MW-2008-15-1C-16	29		39	
10	MW-2008-12-3F-58	20	MW-2008-15-2F-29	30		40	

Notes: _____

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Calibration				
Were all instruments and detectors calibration as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were NIST traceable standards used for all calibrations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the check source identified by activity and radionuclide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Blanks				
Were blank analyses performed as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a duplicate sample analyzed at the required frequency of 5% in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all duplicate sample duplicate error ratios (DER) ≤ 1.42 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were tracer/carrier recoveries within the QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the Minimum Detectable Activities (MDA) $< RL$?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

All circled dates have exceeded the technical holding times.

Y N N/A Were all cooler temperatures within validation criteria?

[illegible]

TECHNICAL HOLDING TIME CRITERIA

Soil: 6 months or 5 half lives
Water: 6 months or 5 half lives

Were all instruments and detectors calibrated as required?

Were all instruments and detectors calibrated as required?

Were NIST traceable standards used for all calibrations?

Was the check source identified by activity and radionuclide?

Were check sources including background counts analyzed at the required frequency and within laboratory control limits?

[illegible]

Comments:

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

[illegible]

Comments:

METHOD: Radiochemistry (Method: see cover)

[illegible]

Comments:

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation WorksheetPage: 1 of 1
Reviewer: CR
2nd Reviewer: hMETHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated		Reported		Acceptable (Y/N)
					%R or RPD	%R or RPD	%R or RPD	%R or RPD	
LCS	Laboratory control sample	Ra-226	452	470	96.2		96.2		Y
N	Matrix spike sample								
26	Duplicate RPD DER	Ra-226	1.7 20 = 0.36	2.2 20 = 0.43	0.89		0.80		Y
N	Chemical recovery								

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.


LDC #: 08406035

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: CR

2nd reviewer: 

METHOD: Radiochemistry (Method: See cover)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A
Y N N/A

Analyte results for Ra-226/Ra-228 reported with a positive detect were recalculated and verified using the following equation:

Concentration =

Recalculation:

$$I = Ra - 228 = 5.11 + 4.54 + 3.30 / 3 = 4.45 \text{ } \mu\text{Ci/g}$$

$$S = R_{a-226} = \frac{2.91 + 3.04 + 2.57 + 1.76}{4} = 2.79 \text{ pCi/g}$$

$$11 = \text{Ra-226} = 2.39 + 2.59 + 2.63 + 3.03 / 4 = 2.57 \text{ pci/g}$$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

[illegible]

note: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Sierrita VRP
Collection Date: August 1 through September 1, 2008
LDC Report Date: December 14, 2012
Matrix: Soil
Parameters: Isotopic Uranium
Validation Level: EPA Level IV
Laboratory: ALS Environmental
Sample Delivery Group (SDG): 0905205

Sample Identification

MW-2008-14-2-63	MW-2008-15-2C-30
MW-2008-14-Calcite-48	MW-2008-15-3F-40
MW-2008-14-3-124	MW-2008-15-3C-42
MW-2008-14-4-159	MW-2008-15-4F-52
MW-2008-12-1F-13	MW-2008-15-4C-55
MW-2008-12-1C-22	MW-2008-14-3-124DUP
MW-2008-12-1F-ORG	MW-2008-13-2C-28DUP
MW-2008-12-2F-39	MW-2008-15-1C-16DUP
MW-2008-12-2C-40	
MW-2008-12-3F-58	
MW-2008-12-3C-63	
MW-2008-13-2C-28	
MW-2008-13-2F-37	
MW-2008-13-3C-51	
MW-2008-13-3F-52	
MW-2008-13-4F-58	
MW-2008-13-4C-69	
MW-2008-15-1F-4	
MW-2008-15-1C-16	
MW-2008-15-2F-29	

Introduction

This data review covers 28 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per ALS SOP 714 Rev 11 for Isotopic Uranium.

This review follows the Addendum to Sampling & Analyses Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoran Sierrita, Inc., Green Valley Arizona (September 2008), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the isotope was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the isotope was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

Detector efficiency was determined for each radionuclide of interest.

III. Continuing Calibration

Continuing calibration and background determination was performed at the required frequencies.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. Blank results contained less than the minimum detectable activity (MDA).

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

A matrix spike (MS) analysis was not required by the method.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Tracer Recovery

All tracer recoveries were within validation criteria.

VIII. Minimum Detectable Activity

All minimum detectable activities met required detection limits.

IX. Sample Result Verification

All sample result verifications were acceptable.

X. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XI. Field Duplicates

No field duplicates were identified in this SDG.

Sierrita VRP
Isotopic Uranium - Data Qualification Summary - SDG 0905205

No Sample Data Qualified in this SDG

Sierrita VRP
Isotopic Uranium - Laboratory Blank Data Qualification Summary - SDG 0905205

No Sample Data Qualified in this SDG

Sierrita VRP
Isotopic Uranium - Field Blank Data Qualification Summary - SDG 0905205

No Sample Data Qualified in this SDG

LDC #: 28908B59

VALIDATION COMPLETENESS WORKSHEET

SDG #: 0905205

Level IV

Laboratory: ALS Environmental

Date: 2-13-13

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: Isotopic Uranium (ALS SOP PAI 714 Rev 11)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	AW	Sampling dates: 8/1 - 9/1/08
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N/A	MS: not required, Dup
VI.	Laboratory control samples	A	LCS
VII.	Tracer Recovery	A	
VIII.	Minimum Detectable Activity (MDA)	A	
IX.	Sample result verification	A	
X.	Overall assessment of data	A	
XI.	Field duplicates	✓	
XII.	Field blanks	✓	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Soil

1	MW-2008-14-2-63	11	MW-2008-12-3C-63	21	MW-2008-15-2C-30	31	
2	MW-2008-14-Calcite-48	12	MW-2008-13-2C-28	22	MW-2008-15-3F-40	32	
3	MW-2008-14-3-124	13	MW-2008-13-2F-37	23	MW-2008-15-3C-42	33	
4	MW-2008-14-4-159	14	MW-2008-13-3C-51	24	MW-2008-15-4F-52	34	
5	MW-2008-12-1F-13	15	MW-2008-13-3F-52	25	MW-2008-15-4C-55	35	
6	MW-2008-12-1C-22	16	MW-2008-13-4F-58	26	MW-2008-14-3-124DUP	36	
7	MW-2008-12-1F-ORG	17	MW-2008-13-4C-69	27	MW-2008-13-2C-28DUP	37	
8	MW-2008-12-2F-39	18	MW-2008-15-1F-4	28	MW-2008-15-1C-16DUP	38	
9	MW-2008-12-2C-40	19	MW-2008-15-1C-16	29		39	
10	MW-2008-12-3F-58	20	MW-2008-15-2F-29	30		40	

Notes: _____

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target analytes were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Target analytes were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

All circled dates have exceeded the technical holding times.

(Y) N N/A Were all cooler temperatures within validation criteria?

[illegible]

TECHNICAL HOLDING TIME CRITERIA

Soil: 6 months or 5 half lives
Water: 6 months or 5 half lives

LDC #: 2898059

VALIDATION FINDINGS WORKSHEET

Level IV Recalculation Worksheet

Page: 1 of 1Reviewer: CR2nd Reviewer: WMETHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = activity of each analyte measured in the analysis of the sample.

True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated		Reported		Acceptable (Y/N)
					%R or RPD		%R or RPD		
LC5	Laboratory control sample	U-238	4.19	4.49	93.3		93.4		Y
N	Matrix spike sample								
26	Duplicate RPD	U-234	0.77 2σ = 0.8	0.94 2σ = 0.21	0.61		0.62		Y
1	Chemical recovery	U-232	4.00	4.442	90		90		Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

note: _____
