



Sierrita Operations
Environment, Land & Water Department
6200 W Duval Mine Road
PO Box 527
Green Valley, AZ 85622-0527

June 4, 2020

Electronic Mail and Hand Delivery

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

RE: Request for Administrative Closure
Freeport-McMoRan Sierrita Inc, Green Valley, Arizona
Voluntary Remediation Program - VRP Site Code: 100073-03

Dear Ms. Pace:

The Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP) issued *Approval of the Final Baseline Human Health Risk Assessment*¹ (BHHRA) and *Permission to Proceed with Request for Administrative Closure*² both on March 17, 2020. ADEQ concluded that although Freeport-McMoRan Sierrita Inc. (FMSI) has not met the statutory requirements necessary to request a No Further Action in soil, FMSI has completed all of the objectives specified in the ADEQ-approved 2015 BHHRA Work Plan and the ADEQ-approved BHHRA.

ADEQ stated the following in footnote 3 in the *Permission to Proceed with Request for Administrative Closure*³:

Based on the uses evaluated in the BHHRA, ADEQ would require an intuitional control in the form of a Declaration of Environmental Use Restriction (DEUR) to maintain the uses predicted. However, the VRP is not requiring a DEUR for these EAs given the entirety of the FMI Sierrita Mine remains an active mine with strict controls in place to prevent trespass and residential construction. As such, placing a deed restriction (the DEUR) on the mine provides no additional protection to human health and the environment. The VRP has determined there is no benefit to requiring a DEUR on an active mine where use will not change until the mine moves into post-closure and other regulatory requirements take effect.

¹ ADEQ 2020a. Approval of the Final Baseline Human Health Risk Assessment. March 17.

² ADEQ 2020b. Permission to Proceed with Request for Administrative Closure. March 17.

³ ADEQ 2020b. Permission to Proceed with Request for Administrative Closure. March 17.

As such, ADEQ stated that FMSI may proceed with requesting Administrative Closure for the human health risks associated with current and/or future outdoor commercial/industrial workers, future trespassers, or future construction workers within the following exposure areas (EAs) evaluated within the BHHRA and shown on Figures 1 through 4:

- The Former Copper Leach Electrowinning and Regeneration (CLEAR) Plant EA, including⁴:
 - Former CLEAR Plant
 - Former Evaporation Pond
 - Old D Pond
- The Former Esperanza Mill EA, including:
 - Former Esperanza Mill
 - Former C Pond and C Pond Spoils
 - Former Raffinate Pond
 - Former Laydown Yard.

The contaminants of concern (COCs) in soil and sediment evaluated in the BHHRA include arsenic, copper, lead, molybdenum, radium-226, radium-228, uranium-235, and uranium-238. In addition to the COCs, additional contaminants of potential concern (COPCs) were also evaluated as part of the BHHRA. These soil and sediment COPCs include antimony, barium, beryllium, cadmium, chromium, cobalt, manganese, mercury, nickel, selenium, thallium, and zinc. As part of data evaluations completed prior to and during development of the BHHRA, these COPCs were screened out and, therefore, not included as COCs with regards to the BHHRA.

ADEQ concluded that based on the review and findings ⁵⁶, that FMSI has shown the following:

- 1) There are no risks to human health associated with current and/or future outdoor commercial/industrial workers, future trespassers, or future construction workers from the soil and sediment for the COCs or additional COPCs.
- 2) There is no evidence of a threat to surface water from the COCs/COPCs emanating from the EAs evaluated in the BHHRA.
- 3) There is no evident threat to groundwater from the COCs/COPCs emanating from the EAs evaluated in the BHHRA.

ADEQ stated in Section 3 (a) of the *Permission to Proceed with Request for Administrative Closure* ⁷ the following:

⁴ Former E Pond is located within the southern portion of the Former CLEAR Plant subarea (Figures 1 and 2) and was included in the BHHRA. The Former E Pond was associated with the CLEAR Plant process and is an APP-regulated subarea that is misidentified in the APP as the Old D Pond. It is FMSI's intent to maintain the terminology of "Old D Pond" in the APP, close it under the APP and, therefore, Former E Pond as labelled "Old D Pond" in the APP is not included in the request for Administrative Closure.

⁵ ADEQ 2020a. Approval of the Final Baseline Human Health Risk Assessment. March 17.

⁶ ADEQ 2020b. Permission to Proceed with Request for Administrative Closure. March 17.

⁷ ADEQ 2020b. Permission to Proceed with Request for Administrative Closure. March 17.

Antimony exceeded the default GPL of 35 milligrams per kilogram (mg/kg) in two surface samples collected at the Former CLEAR Plant EA and in one surface sample at the Former Esperanza Mill EA. FMI did not calculate an alternative GPL for antimony, as synthetic precipitation leaching procedure data was not collected. Antimony was characterized to below the default GPL in numerous subsurface samples in both EAs, suggesting the limited number of samples containing antimony were isolated and located at or near surface only. Furthermore, antimony has not been detected in groundwater above the Arizona Water Quality Standard (AWQS) of 0.006 mg/L with the exception of well TW-2008-10, which is located upgradient of the EAs investigated in the BHHRA, and is related to monitoring associated with Bailey Lake¹⁴ and Raffinate Pond #2¹⁵. As such, the VRP does not consider antimony a source of potential impact to groundwater emanating from the EAs investigated in the BHHRA.

The approved Data Gaps Work Plan⁸ proposed that confirmation soil samples be collected from the former CLEAR Plant and former Raffinate Pond specifically to derive a site-specific alternative groundwater protection level (GPL) for antimony. These samples were collected in June 2016 even though the laboratory data were never formally submitted to ADEQ because the Work Plan had been put on hold. A site-specific alternative GPL of 200 mg/kg was calculated based on these data, and no samples exceeded this value. Therefore, as additional support to ADEQ's findings in support of Administrative Closure⁹, these data corroborate that antimony is not a source of potential impact to groundwater emanating from the areas investigated. A summary of the sampling and analysis is included in Attachment 1.

Therefore, based on these findings, FSMI is requesting Administrative Closure for the COCs and COPCs for which there has been shown no risk to surface water, groundwater, nor the human health risks associated with current and/or future outdoor commercial/industrial workers, future trespassers, or future construction workers within the above referenced EAs. Table 1 summarizes the key findings from the BHHRA, including the excess lifetime cancer risks and hazard indices developed based on site-specific data. Table 2 includes the default and site-specific alternative GPLs for lead and antimony.

FMSI understands that when ADEQ issues the Administrative Closure, this will close out VRP requirements for FMSI to conduct any further evaluation of the potential for human health risks associated with current and/or future outdoor commercial/industrial workers, future trespassers, and/or future construction workers within the EAs referenced above.

⁸ Arcadis 2015. Data Gaps Work Plan. October 8.

⁹ ADEQ 2020b. Permission to Proceed with Request for Administrative Closure. March 17

Please do not hesitate to contact me at (520) 393-2347 if you have any questions regarding this submittal. Thank you for your assistance and cooperation with our efforts to address environmental issues at this Site.

Sincerely,



William Hart
Sr. Environmental Scientist
Freeport-McMoRan Sierrita Inc.

Copy:

David Gosen, Freeport-McMoRan Inc.
Katy Brantingham, Arcadis
Anne Thatcher, Arcadis

Enclosures:

Tables

- 1 Human Health Risks and Hazard Indices for Receptor Exposure to COCs in Soil/Sediment and the Exposure Areas evaluated in the BHHRA
- 2 Alternative Groundwater Protection Levels for Lead and Antimony in Soil/Sediment in the Exposure Areas

Figures

- 1 Administrative Closure Area Boundaries
- 2 Former Clear Plant Exposure Area
- 3 Former Clear Plant Exposure Area – Old D Pond
- 4 Former Esperanza Mill Exposure Area

Attachments

- 1 Data Gaps Soil Assessment Activities for Antimony

TABLES



Table 1. Human Health Risks and Hazard Indices for Receptor Exposure to COCs in Soil/Sediment at the Exposure Areas Evaluated in the BHHRA

Former CLEAR Plant Exposure Area ¹		
Receptor	Shallow Soil/Sediment	Shallow and Deep Soil/Sediment
Current Scenario		
Site-Specific Outdoor Commercial/Industrial Worker	ELCR = 8×10^{-5} ; HI=0.3	Not applicable
Future Scenario		
Site-Specific Outdoor Commercial/Industrial Worker	ELCR = 8×10^{-5} ; HI=0.2	ELCR = 9×10^{-5} ; HI=0.2
Hypothetical Construction Worker	Not applicable	ELCR = 8×10^{-6} ; HI=0.6
Hypothetical Adolescent Trespasser	ELCR = 2×10^{-6} ; HI=0.04	ELCR = 2×10^{-6} ; HI=0.03
Former Esperanza Mill Exposure Area ²		
Receptor	Shallow Soil/Sediment	Shallow and Deep Soil/Sediment
Current Scenario		
Site-Specific Outdoor Commercial/Industrial Worker	ELCR = 9×10^{-5} ; HI=0.3	Not applicable
Future Scenario		
Site-Specific Outdoor Commercial/Industrial Worker	ELCR = 9×10^{-5} ; HI=0.3	ELCR = 8×10^{-5} ; HI=0.2
Hypothetical Construction Worker	Not applicable	ELCR = 8×10^{-6} ; HI=0.9
Hypothetical Adolescent Trespasser	ELCR = 2×10^{-6} ; HI=0.07	ELCR = 2×10^{-6} ; HI=0.05

Note:

1. The Former Copper Leach Electrowinning and Regeneration (CLEAR) Plant Exposure Area (EA) includes the Former CLEAR Plant, Former E Pond, Former Evaporation Pond, and the Old D Pond. The COCs in soil/sediment for the Former CLEAR Plant EA include arsenic, copper, lead³, radium-226, radium-228, uranium-235, and uranium-238.

2. The Former Esperanza Mill EA includes the Former Esperanza Mill, the Former C Pond and C Pond Spoils, the Former Raffinate Pond, and the Former Laydown Yard. The COCs in soil/sediment for the Former Esperanza Mill EA include arsenic, lead³, molybdenum, radium-226, radium-228, uranium-235, and uranium-238.

3. In accordance with USEPA guidance, lead exposure was evaluated in the BHHRA using the USEPA's Adult Lead Model (ALM). Based on the ALM, exposures to lead in soil/sediment at the Former CLEAR Plant EA and the Former Esperanza Mill EA are not likely to result in adverse health effects in current/future outdoor commercial/industrial workers, future construction workers, or future trespassers.

BHHRA - baseline human health risk assessment.

COC - contaminant of concern.

ELCR - excess lifetime cancer risk.

HI - hazard index.

USEPA - United States Environmental Protection Agency.

Table 2. Alternate Groundwater Protection Levels (GPLs) for Lead and Antimony in Soil/Sediment in the Exposure Areas

Constituent	Default GPL mg/kg	Site-Specific Alternate GPL mg/kg
Lead	290	25,556
Antimony	35	200

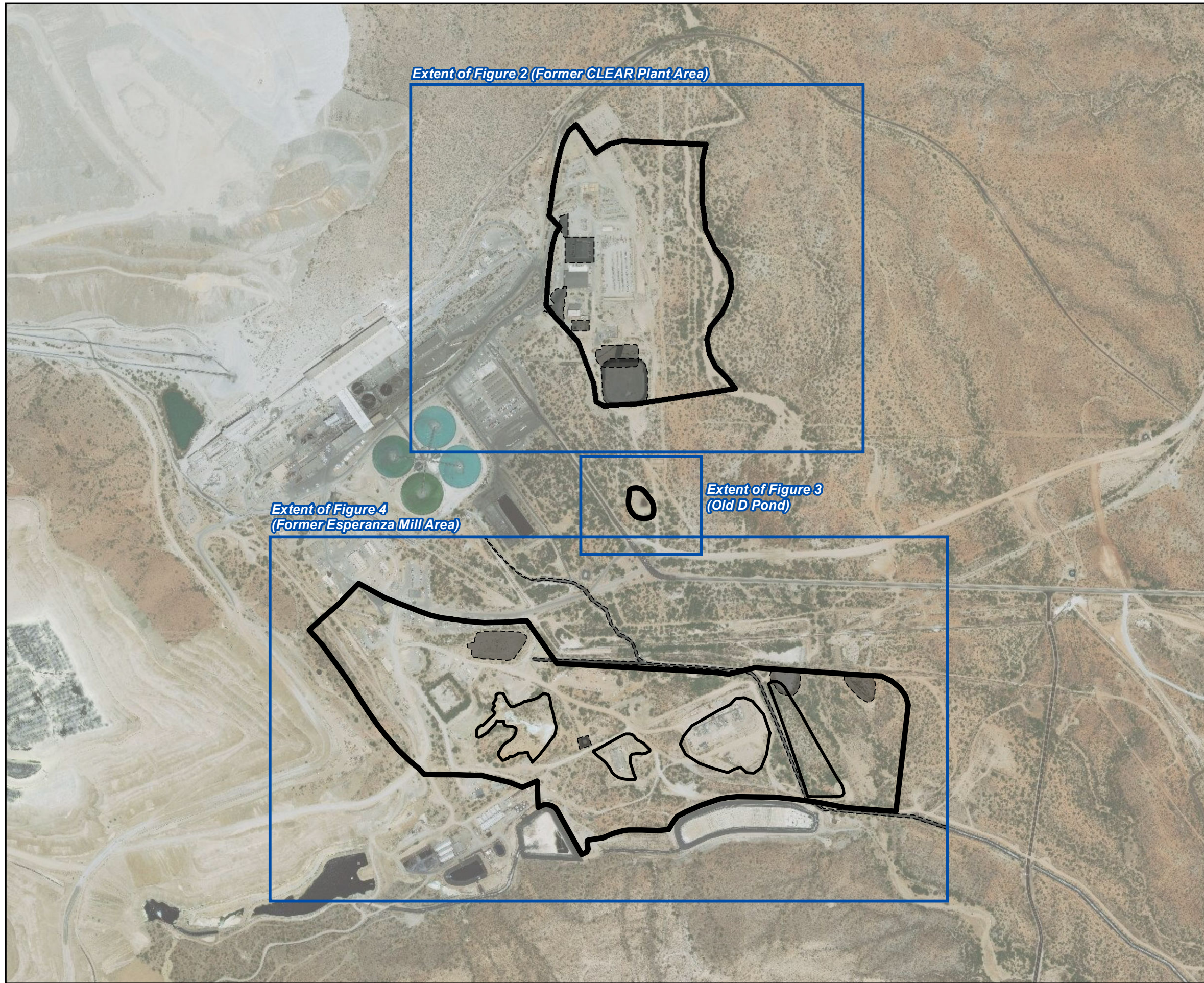
Note:

GPL - Groundwater Protection Level

mg/kg - milligram per kilogram

FIGURES





SITE LOCATION



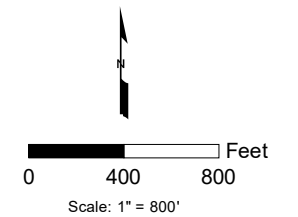
Scale: 1" = 200 miles

LEGEND

- Area proposed for Administrative Closure
- Former Esperanza Mill subarea; included in Administrative Closure
- Area excluded from Administrative Closure*
- Figure extent (see Figures 2 through 4)

NOTES

- Aerial photo source: ESRI World Imagery.
- * = Areas excluded from Administrative Closure include Aquifer Protection Program (APP) facilities and areas previously approved for No Further Action (NFA).



FREEPORT-MCMORAN SIERRITA INC.
GREEN VALLEY, ARIZONA

ADMINISTRATIVE CLOSURE AREA BOUNDARIES



FIGURE
1

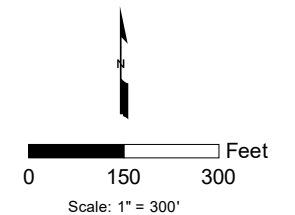


LEGEND

- Administrative Closure boundary for Former CLEAR Plant Area
- Area excluded from Administrative Closure*

NOTES

- Aerial photo source: ESRI World Imagery.
- * = Areas excluded from Administrative Closure include Aquifer Protection Program (APP) facilities and areas previously approved for No Further Action (NFA).
- The Former Evaporation Pond is located within the southern portion of the Former CLEAR Plant subarea and was included in the Baseline Human Health Risk Assessment (BHHRA). The Former Evaporation Pond was associated with the CLEAR Plant process and is an APP-regulated subarea that is misidentified in the APP as the "Old D Pond" (APP facility D-13). It is FMSI's intent to maintain the terminology of "Old D Pond" in the APP and close it under the APP. Therefore, the Former Evaporation Pond as labeled "Old D Pond" in the APP is not included in the request for Administrative Closure.




FREEPORT-MCMORAN SIERRITA INC.
GREEN VALLEY, ARIZONA

**FORMER CLEAR PLANT AREA
ADMINISTRATIVE CLOSURE BOUNDARY**



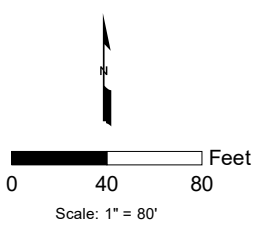


LEGEND

 Administrative Closure boundary for Old D Pond

NOTES

· Aerial photo source: ESRI World Imagery.

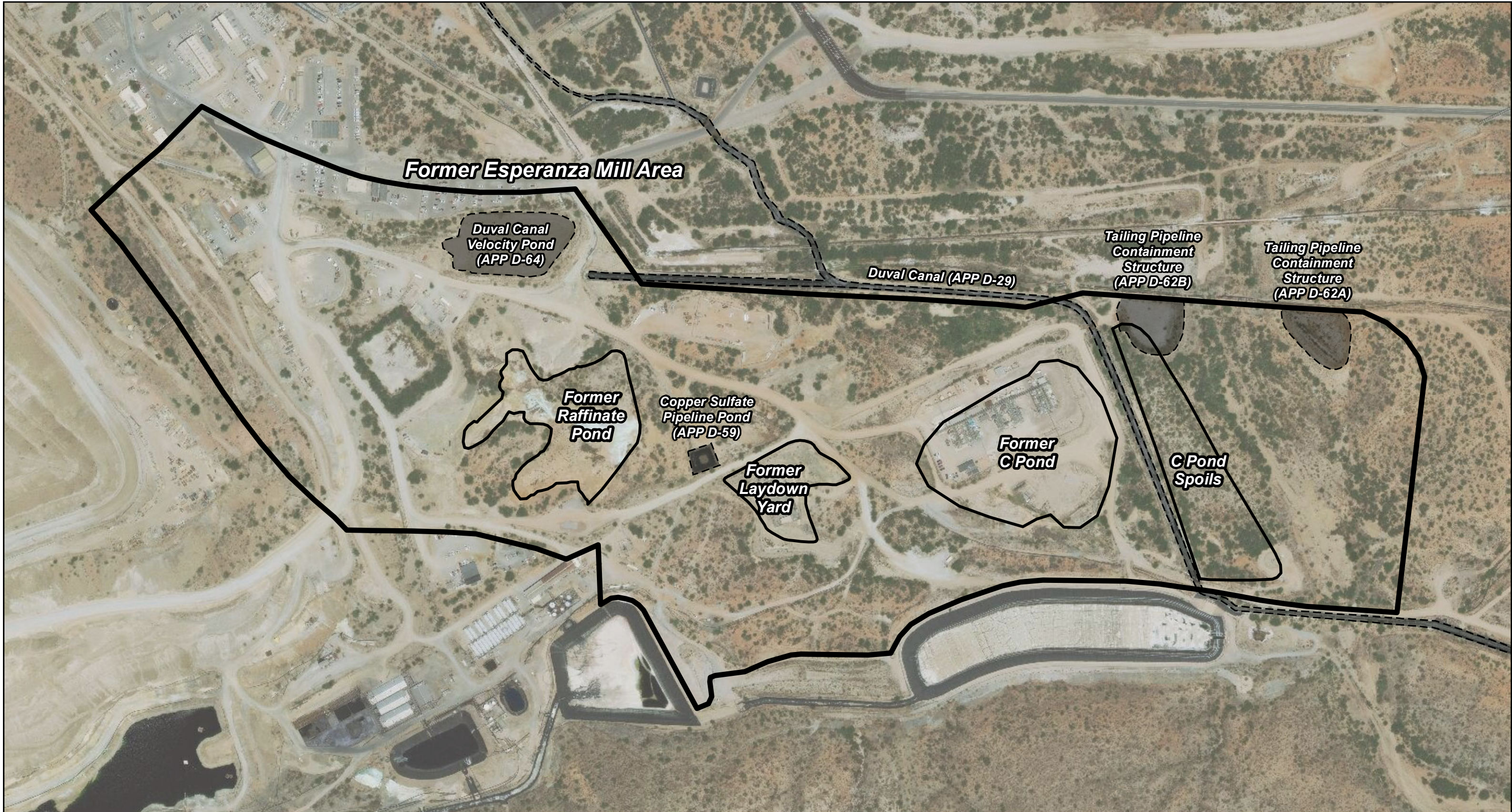


FREEPORT-MCMORAN SIERRITA INC.
GREEN VALLEY, ARIZONA

**FORMER CLEAR PLANT AREA – OLD D POND
ADMINISTRATIVE CLOSURE BOUNDARY**



\\scottsdale-AZ\\Project\\Sierrita\\GIS\\Projects\\Administrative closure 04-2020\\Figure 4 former Esperanza Mill area administrative closure boundary.mxd 6/3/2020

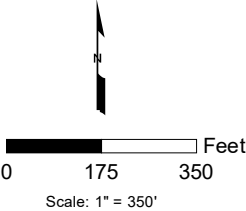


LEGEND

- Administrative Closure boundary for Former Esperanza Mill Area
- Former Esperanza Mill subarea; included in Administrative Closure
- Area excluded from Administrative Closure*

NOTES

- Aerial photo source: ESRI World Imagery.
- * = Areas excluded from Administrative Closure include Aquifer Protection Program (APP) facilities.



FREEPORT-MCMORAN SIERRITA INC. GREEN VALLEY, ARIZONA	
FORMER ESPERANZA MILL AREA ADMINISTRATIVE CLOSURE BOUNDARY	
	FIGURE 4

ATTACHMENT 1

Data Gaps Soil Assessment Activities for Antimony



Ms. Joey Pace
Project Manager
Voluntary Remediation Program
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, AZ 85007

Arcadis U.S., Inc.
410 N. 44th Street
Suite 1000
Phoenix
Arizona 85008
Tel 602 438 0883
Fax 602 438 0102
www.arcadis.com

Subject:

Data Gaps Soil Assessment Activities for Antimony
Freeport-McMoRan Sierrita Mine, Green Valley, Arizona; Site Code – 100073-03

ENVIRONMENT

Date:

May 14, 2020

Dear Ms. Pace:

Contact:

Katy Brantingham

Phone:

602-797-4523

Email:

Katy.Brantingham@
arcadis.com

Our ref:

30008737

Arcadis U.S., Inc. (Arcadis) has prepared this letter report on behalf of Freeport-McMoRan Sierrita Inc. to present the results of supplemental soil assessment activities performed at the Freeport-McMoRan Sierrita Mine, Voluntary Remediation Program (VRP) Site Code – 100073-03, in Green Valley, Arizona (the Site). This work was performed in accordance with the revised Data Gaps Work Plan dated October 8, 2015 and the Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP) addenda therein¹, as well as the QAPP and FSP addenda prepared by URS². The initial site characterization activities for the VRP were performed in 2008 and 2009. Following these activities, the data were assessed, and data gaps were identified in the Groundwater Investigation Report³ and in the Arizona Department of Environmental Quality's (ADEQ's) comments on the Groundwater Investigation Report⁴. The Data Gaps Work Plan summarized these data gaps and identified supplemental site characterization activities in each investigation area. During a meeting on August 3, 2017, the decision was made by ADEQ that the groundwater investigation and sampling work that was identified to be conducted in the Data Gaps Work Plan was no longer required by the VRP. This letter discusses additional activities

¹ Arcadis. 2015. Data Gaps Work Plan. Freeport-McMoRan Sierrita Inc., Green Valley, Arizona. October 8.

² URS. 2008. Addendum to Sampling & Analysis Plan (SAP) & Quality Assurance Project Plan (QAPP), Voluntary Remediation Program (VRP), Freeport-McMoRan Sierrita Green Valley, Arizona. Prepared for Freeport-McMoRan Sierrita Inc. September.

³ Arcadis. 2013. Voluntary Remediation Program Groundwater Investigation Report, Sierrita Mine, Green Valley, Arizona. December.

⁴ ADEQ. 2014. Letter from Danielle Taber, ADEQ to John Broderick, Sierrita – Comments to Freeport-McMoRan on the Groundwater Investigation Report dated April 11, 2014. Freeport-McMoRan Sierrita Inc., Green Valley, Arizona VRP Site Code 100073-03.

performed to address the soil data gaps identified for the Central Investigation Area that were completed prior to the August 3, 2017 meeting.

Three soil samples collected during the 2008-2009 VRP activities in the Central Investigation Area yielded exceedances of the default antimony groundwater protection level (GPL) of 35 milligrams per kilogram (mg/kg). One of the samples (EM-17) was collected in the Former Raffinate Pond subarea, located on Figure 1, and two of the samples (CP-1 and CP-2) were collected in the Former Copper Leach Electrowinning and Regeneration (CLEAR) Plant, subarea, located on Figure 2. All samples that yielded exceedances of the default GPL were collected at a depth of 0.25 feet below ground surface (feet bgs).

On June 23, 2016, Arcadis collected two confirmation samples from the vicinity of each previous GPL exceedance (six samples total) to a depth of 0.25 feet bgs. The samples were analyzed for total and synthetic precipitation leaching procedure (SPLP) antimony according to United States Environmental Protection Agency Methods 6010C and 6020A, respectively. The analysis was performed by SVL Analytical laboratory in Kellogg, Idaho, an Arizona Department of Health Services (ADHS) certified laboratory, license number AZ0538.

The sample locations are presented on Figures 1 and 2, the analytical results are provided on Table 1 and laboratory analytical report is provided in Attachment 1. The sample locations were initially located using a handheld GPS, staked and later surveyed by the Sierrita Mine surveyor, with the coordinates provided in Table 1. A photo log of each of the sampled locations is provided in Attachment 2.

The confirmation samples collected at the Former Esperanza Mill Area in the vicinity of former sampling location EM-17 had total antimony concentrations of 9.4 mg/kg and 120 mg/kg, the second sample (EM17-SO2) exceeded the default GPL of 35 mg/kg for antimony. The antimony SPLP results were 0.00072 and 0.00097 milligrams per liter (mg/L) which are below the Arizona aquifer water quality standard (AWQS) for antimony of 0.006 mg/L.

The confirmation samples collected in the vicinity of the Former CLEAR Plant sampling location CP-1 had total antimony concentrations of 6.1 mg/kg and 37.6 mg/kg, the second sample (CP1-SO2) exceeded the default GPL for antimony. The antimony SPLP results were 0.00023 and 0.00025 mg/L which are below the AWQS for antimony of 0.006 mg/L.

The confirmation samples collected in the vicinity of the Former CLEAR Plant sampling location CP-2 had total antimony concentrations of 1.8 mg/kg and 3.2 mg/kg, where both concentrations were below the default GPL for antimony. The antimony SPLP results were 0.00079 and 0.00065 mg/L which are below the AWQS for antimony of 0.006 mg/L. A duplicate sample was collected at location CP2-SO2 with the results within acceptable limits.

Ms. Joey Pace

May 14, 2020

A site-specific alternate GPL of 200 mg/kg was calculated for antimony as shown in Table 1. All of the samples that exceeded the default GPL for antimony of 35 mg/kg did not exceed the site-specific alternate GPL of 200 mg/kg. Therefore, antimony is not a source of potential impact to groundwater emanating from the areas investigated.

Sincerely,

Arcadis U.S., Inc.



Kathryn Brantingham
Associate Vice President/CPM3

Copies:

William Hart, Freeport-McMoRan Sierrita Inc.

David Gossen, Freeport-McMoRan

Enclosures:

Tables

- 1 Antimony Concentrations in Soil and GPL Calculations

Figures

- 1 Former Esperanza Mill Soil Sample Locations, June 2016
- 2 Former CLEAR Plant Soil Sample Locations, June 2016

Attachments

- 1 Laboratory Analytical Report
- 2 Photographic Log

TABLES



Table 1
Antimony Concentrations in Soil and GPL Calculations
Freeport-McMoRan Sierrita Inc.
Green Valley, Arizona

Sample Identification	Sample Date	Northing	Easting	Elevation (ft amsl)	Total Antimony (mg/kg dry)	SPLP Antimony (mg/L)	R	Alternative GPL (mg/kg)
EM17-S01-DO-0.25	6/23/2016	134274.60	392095.19	3591.699	8.4	0.00072 J	583	1,025
EM17-S02-DO-0.25	6/23/2016	134264.05	392080.48	3592.346	120	0.00097 J	6,186	10,871
CP1-S01-DO-0.25	6/23/2016	138448.86	392086.54	3668.802	6.1	0.00025 J	1,220	2,144
CP1-S02-DO-0.25	6/23/2016	138459.16	392081.68	3668.061	37.6	0.00023 J	8,174	14,365
CP2-S01-DO-0.25	6/23/2016	137191.59	392079.21	3643.151	1.8 J	0.00079 J	114	200
CP2-S01-DO-0.25D ¹	6/23/2016	137191.59	392079.21	3643.151	1.9 J	0.00081 J	117	206
CP2-S02-DO-0.25	6/23/2016	137178.43	392107.82	3642.787	3.2	0.00065 J	246	433
Residential Soil Remediation Level Non-Carcinogen (r-SRL-2007)					31			
Non-Residential Soil Remediation Level (nr-SRL-2007)					410			
Default Groundwater Protection Level (GPL)					35			
Alternative GPL					200			
AWQS (mg/L)					0.006			

Notes:
¹ Duplicate of CP2-S01-DO-0.25
Alternative GPL calculated as 292.9 x R x AWQS (ADEQ 1996)
AWQS = Aquifer Water Quality Standard
GPL = Groundwater Protection Level
J = The reported value is less than the laboratory reporting limit but greater than or equal to the method detection limit.
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
R = Total/(SPLP/20) (ratio of Total to SPLP)
SPLP = synthetic precipitation leaching procedure
SPLP antimony analyzed by USEPA Method 6020A
The AWQS for antimony is 0.006 mg/L
Total antimony analyzed by USEPA Method 6010C
USEPA = United States Environmental Protection Agency
XX - Value Alternative GPL
XX - Value Exceeds nr-SRL or Minimum GPL
XX - Value Exceeds r-SRL but not nr-SRL and not GPL

FIGURES



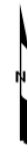


Legend

- | | | |
|---------------------------------|-----------------------|------------------------------|
| Soil Sample Locations | ★ Sediment Sample | ✦ VRP Monitoring Well |
| ■ Judgment Soil Boring | ▲ Surface Soil Sample | □ Former CLEAR Plant Subarea |
| ▲ Random Soil Boring | ● Trench Location | |
| ● 2016 Soil Confirmation Sample | | |

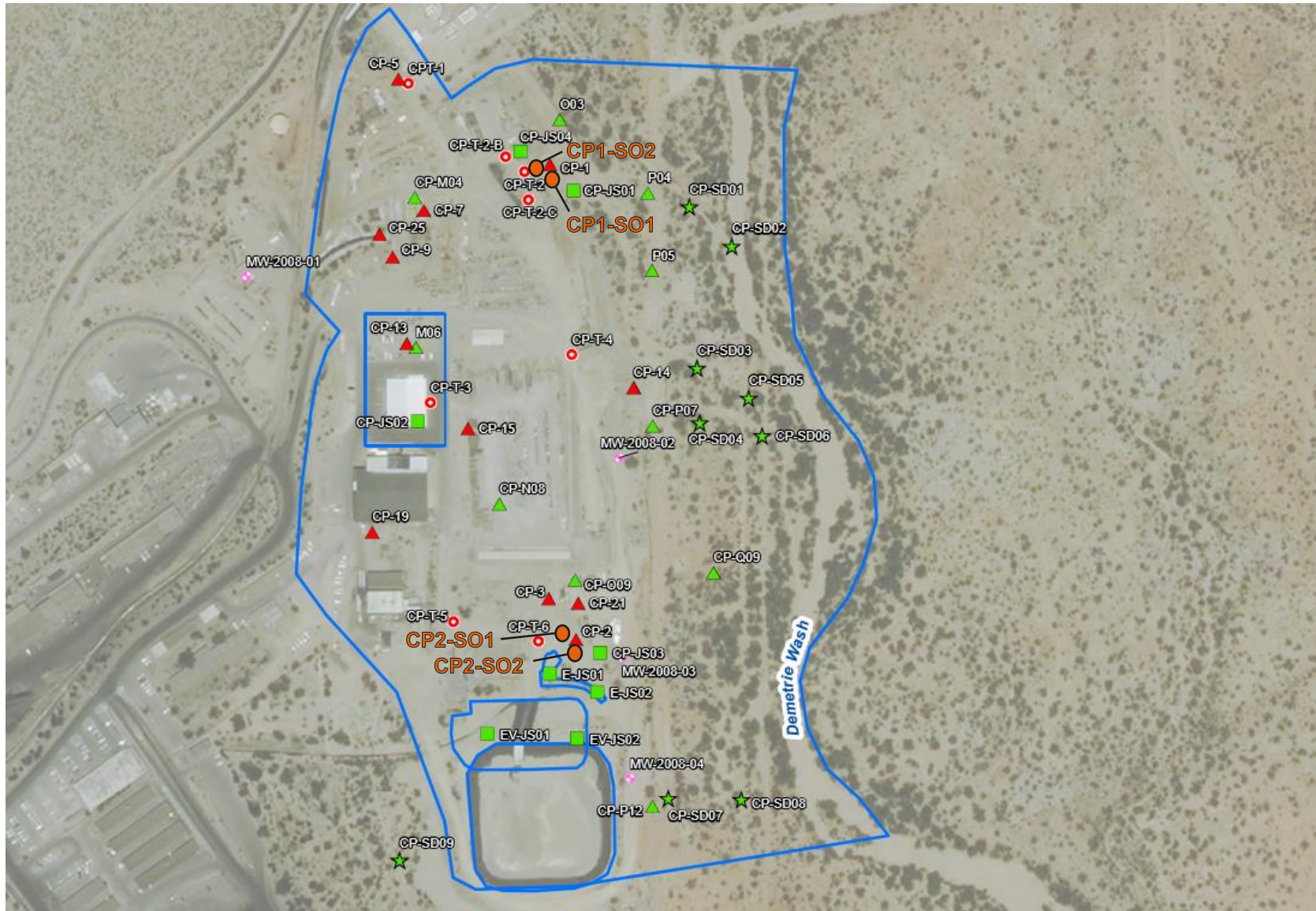
NOTE:
VRP - Voluntary Remediation Program

0 175 350 700
Feet



SIERRITA MINE, GREEN VALLEY, ARIZONA
VOLUNTARY REMEDIATION PROJECT

FORMER ESPERANZA MILL SOIL
SAMPLE LOCATIONS, JUNE 2016



Legend

Soil Sample Locations

■ Judgment Soil Boring

▲ Random Soil Boring

● 2016 Soil Confirmation Sample



Sediment Sample



Surface Soil Sample



Trench Location



VRP Monitoring Well



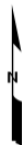
Former CLEAR Plant Subarea

NOTE:

VRP - Voluntary Remediation Program

CLEAR - Continuous Liquid Extraction and Regeneration

0 150 300 600
Feet



SIERRITA MINE, GREEN VALLEY, ARIZONA
VOLUNTARY REMEDIATION PROJECT

**FORMER CLEAR PLANT SOIL SAMPLE
LOCATIONS, JUNE 2016**

ARCADIS Design & Consultancy
for natural and
built assets

FIGURE
2

ATTACHMENT 1

Laboratory Analytical Report





Arcadis (Phoenix)
410 N. 44th Street, Suite 1000
Phoenix, AZ 85008

Project Name: Sierrita Mine Soils 2016 / AZ001233.0022

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received	Notes
EM17-S01-DO-0.25	W6F0668-01	Solid	23-Jun-16 07:10	AP	28-Jun-2016	
EM17-S02-DO-0.25	W6F0668-02	Solid	23-Jun-16 07:20	AP	28-Jun-2016	
CP1-S01-DO-0.25	W6F0668-03	Solid	23-Jun-16 08:00	AP	28-Jun-2016	
CP1-S02-DO-0.25	W6F0668-04	Solid	23-Jun-16 08:10	AP	28-Jun-2016	
CP2-S01-DO-0.25	W6F0668-05	Solid	23-Jun-16 08:45	AP	28-Jun-2016	
CP2-S01-DO-0.25D	W6F0668-06	Solid	23-Jun-16 08:45	AP	28-Jun-2016	Q1
CP2-S02-DO-0.25	W6F0668-07	Solid	23-Jun-16 08:45	AP	28-Jun-2016	

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative: W6F0668

6/28/16 - CM - Several glass jars were severely broken upon receipt. Since two jars were collected for each sample, there was one unbroken jar for each sample, except -06 (CP2-SO1-DO-0.25D) which had to be transferred to a clean jar by SVL staff.



www.svl.net

One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Arcadis (Phoenix)
410 N. 44th Street, Suite 1000
Phoenix, AZ 85008

Project Name: **Sierrita Mine Soils 2016 / AZ001233.0022**

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Client Sample ID: **EM17-S01-DO-0.25**

SVL Sample ID: **W6F0668-01 (Solid)**

Sample Report Page 1 of 1

Sampled: 23-Jun-16 07:10

Received: 28-Jun-16

Sampled By: AP

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010C	Antimony	8.4	mg/Kg dry	2.0	0.740		W628008	AS	07/08/16 10:13	
SPLP Leachates (Metals)										
EPA 6020A	Antimony	0.72	µg/L	3.0	0.19		W629076	KWH	07/13/16 10:46	J
Percent Solids / Percent Moisture										
Percent Solids	% Solids	97.7	%	0.1			W628009	JAA	07/05/16 11:40	
SPLP Extraction Parameters										
SW-846 1312	Extract pH	3.75	pH Units				W628157	ESB	07/11/16 14:05	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Kirby Gray
Technical Director



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One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Arcadis (Phoenix)
410 N. 44th Street, Suite 1000
Phoenix, AZ 85008

Project Name: **Sierrita Mine Soils 2016 / AZ001233.0022**

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Client Sample ID: **EM17-S02-DO-0.25**

SVL Sample ID: **W6F0668-02 (Solid)**

Sample Report Page 1 of 1

Sampled: 23-Jun-16 07:20

Received: 28-Jun-16

Sampled By: AP

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010C	Antimony	120	mg/Kg dry	2.0	0.740		W628008	AS	07/08/16 10:17	
SPLP Leachates (Metals)										
EPA 6020A	Antimony	0.97	µg/L	3.0	0.19		W629076	KWH	07/13/16 10:48	J
Percent Solids / Percent Moisture										
Percent Solids	% Solids	98.0	%	0.1			W628009	JAA	07/05/16 11:40	
SPLP Extraction Parameters										
SW-846 1312	Extract pH	3.72	pH Units				W628157	ESB	07/11/16 14:05	

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Project Name: **Sierrita Mine Soils 2016 / AZ001233.0022**

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Client Sample ID: **CP1-S01-DO-0.25**

SVL Sample ID: **W6F0668-03 (Solid)**

Sample Report Page 1 of 1

Sampled: 23-Jun-16 08:00

Received: 28-Jun-16

Sampled By: AP

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010C	Antimony	6.1	mg/Kg dry	2.1	0.750		W628008	AS	07/08/16 10:20	
SPLP Leachates (Metals)										
EPA 6020A	Antimony	0.25	µg/L	3.0	0.19		W629076	KWH	07/13/16 10:37	J
Percent Solids / Percent Moisture										
Percent Solids	% Solids	96.2	%	0.1			W628009	JAA	07/05/16 11:40	
SPLP Extraction Parameters										
SW-846 1312	Extract pH	3.32	pH Units				W628157	ESB	07/11/16 14:05	

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Project Name: **Sierrita Mine Soils 2016 / AZ001233.0022**

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Client Sample ID: **CP1-S02-DO-0.25**

SVL Sample ID: **W6F0668-04 (Solid)**

Sample Report Page 1 of 1

Sampled: 23-Jun-16 08:10

Received: 28-Jun-16

Sampled By: AP

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010C	Antimony	37.6	mg/Kg dry	2.5	0.900		W628008	AS	07/08/16 10:34	
SPLP Leachates (Metals)										
EPA 6020A	Antimony	0.23	µg/L	3.0	0.19		W629076	KWH	07/13/16 10:50	J
Percent Solids / Percent Moisture										
Percent Solids	% Solids	80.4	%	0.1			W628009	JAA	07/05/16 11:40	
SPLP Extraction Parameters										
SW-846 1312	Extract pH	2.72	pH Units				W628157	ESB	07/11/16 14:05	

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Project Name: **Sierrita Mine Soils 2016 / AZ001233.0022**

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Client Sample ID: **CP2-S01-DO-0.25**

SVL Sample ID: **W6F0668-05 (Solid)**

Sample Report Page 1 of 1

Sampled: 23-Jun-16 08:45

Received: 28-Jun-16

Sampled By: AP

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010C	Antimony	1.8	mg/Kg dry	2.0	0.730		W628008	AS	07/08/16 10:37	J
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SPLP Leachates (Metals)

EPA 6020A	Antimony	0.79	µg/L	3.0	0.19		W629076	KWH	07/13/16 10:56	J
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Percent Solids / Percent Moisture

Percent Solids	% Solids	99.1	%	0.1			W628009	JAA	07/05/16 11:40	
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SPLP Extraction Parameters

SW-846 1312	Extract pH	6.62	pH Units				W628157	ESB	07/11/16 14:05	
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Project Name: **Sierrita Mine Soils 2016 / AZ001233.0022**

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Client Sample ID: **CP2-S01-DO-0.25D**

SVL Sample ID: **W6F0668-06 (Solid)**

Sample Report Page 1 of 1

Sampled: 23-Jun-16 08:45

Received: 28-Jun-16

Sampled By: AP

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010C	Antimony	1.9	mg/Kg dry	2.0	0.730		W628008	AS	07/08/16 10:49	J
SPLP Leachates (Metals)										
EPA 6020A	Antimony	0.81	µg/L	3.0	0.19		W629076	KWH	07/13/16 10:58	J
Percent Solids / Percent Moisture										
Percent Solids	% Solids	99.2	%	0.1			W628009	JAA	07/05/16 11:40	
SPLP Extraction Parameters										
SW-846 1312	Extract pH	7.33	pH Units				W628157	ESB	07/11/16 14:05	

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Project Name: **Sierrita Mine Soils 2016 / AZ001233.0022**

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Client Sample ID: **CP2-S02-DO-0.25**

SVL Sample ID: **W6F0668-07 (Solid)**

Sample Report Page 1 of 1

Sampled: 23-Jun-16 08:45

Received: 28-Jun-16

Sampled By: AP

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010C	Antimony	3.2	mg/Kg dry	2.0	0.730		W628008	AS	07/08/16 10:52	
SPLP Leachates (Metals)										
EPA 6020A	Antimony	0.65	µg/L	3.0	0.19		W629076	KWH	07/13/16 11:00	J
Percent Solids / Percent Moisture										
Percent Solids	% Solids	98.4	%	0.1			W628009	JAA	07/05/16 11:40	
SPLP Extraction Parameters										
SW-846 1312	Extract pH	7.25	pH Units				W628157	ESB	07/11/16 14:05	

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Project Name: Sierrita Mine Soils 2016 / AZ001233.0022

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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SPLP Extraction Parameters

SW-846 1312	Extract pH	pH Units	5.00			W628157	11-Jul-16	
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Quality Control - EXTRACTION BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010C	Antimony	mg/kg	105	100	105	80.00 - 120.00	W628008	08-Jul-16	
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SPLP Leachates (Metals)

EPA 6020A	Antimony	µg/L	24.1	25	96	80.00 - 120.00	W629076	13-Jul-16	
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Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Percent Solids / Percent Moisture

Percent Solids	% Solids	%	95.3	96.2	0.9	20	W628009	05-Jul-16	
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010C	Antimony	mg/kg	5.9445	6.0879	2.0	2.0781	W628008	08-Jul-16	
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Project Name: Sierrita Mine Soils 2016 / AZ001233.0022

Work Order: **W6F0668**

Reported: 14-Jul-16 12:22

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010C	Antimony	mg/kg	114.6301	6.0879	103.91	104	75.00 - 125.00	W628008	08-Jul-16	
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SPLP Leachates (Metals)

EPA 6020A	Antimony	µg/L	24.4500	0.2500	25.00	97	75.00 - 125.00	W629076	13-Jul-16	
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Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	%R	RPD	RPD Limit	Batch ID	Analyzed	Notes
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SPLP Leachates (Metals)

EPA 6020A	Antimony	µg/L	24.1400		25.00	96	1.0		W629076	13-Jul-16	
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Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Notes and Definitions

J	The reported value is less than the Reporting Limit (MRL, CRDL) but greater than or equal to the MDL. Results closer to the MDL have increased relative uncertainty.
Q1	Sample integrity was not maintained. See case narrative.
U	Less than MDL.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

ATTACHMENT 2

Photographic Log



Attachment 2
Photographic Documentation

Photo: 1

**Description: Former
Esperanza Mill EM-17
Sampling Locations
S02 and S01 Looking
Towards Northeast**



Photo: 2

**Description: Former
Esperanza Mill Sample
Location EM-17-S02
Looking Towards
South**



Attachment 2
Photographic Documentation

Photo: 3

**Description: CLEAR
Plant CP-1 sampling
Location S01 Looking
Towards West**



Photo: 4

**Description: CLEAR
Plant CP-1 sample
Location S02 Looking
Towards West**



Attachment 2
Photographic Documentation

Photo: 5

**Description: CLEAR
Plant CP-2 sampling
Locations S02 and S01
Looking Towards
Northwest**



Photo: 6

**Description: CLEAR
Plant CP-2 sample
Location S02 Looking
Towards South**

