FREEPORT-McMoRan
COPPER & GOLD

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

October 28, 2011

Via Certified Mail # 7001 1150 0000 0283 5347
Return Receipt Requested

Ms. Mindy Cross
Arizona Department of Environmental Quality
Water Quality Compliance Section
1110 West Washington Street
Phoenix, Arizona 85007-2935

Re: Semiannual Groundwater Monitoring Report for Samples Collected During the Second and Third Quarters 2011 Mitigation Order on Consent Docket No. P-50-06

Dear Ms. Cross:

Attached please find three (3) hard copies and one (1) disc of the Semiannual Groundwater Monitoring Report for Samples Collected During the Second and Third Quarters 2011, prepared by Clear Creek Associates for Freeport-McMoRan Sierrita Inc. (Sierrita). This document provides results of groundwater monitoring conducted during the second and third quarter of 2011, as agreed upon and described on letter from ADEQ to Sierrita dated April 17, 2009.

Please do not hesitate to contact Mr. Stuart Brown at (602) 448-0972 or myself at (520) 393-2696 if you have any question regarding this submittal.

Sincerely,

Martha G. Mottley
Chief Environmental Engineer
Freeport-McMoRan Sierrita Inc.

20111028_005
MGM:ms

xc: Henry Darwin, Arizona Department of Environmental Quality
Marcia Colquitt, Arizona Department of Environmental Quality
John Broderick, Sierrita
Lana Fretz, Sierrita
Ned Hall, Freeport-McMoRan Copper & Gold
Stuart Brown, Freeport-McMoRan Copper & Gold
Jim Norris, Clear Creek Associates

SEMIANNUAL GROUNDWATER MONITORING REPORT FOR SAMPLES COLLECTED DURING THE SECOND AND THIRD QUARTERS 2011

MITIGATION ORDER ON CONSENT DOCKET NO. P-50-06 PIMA COUNTY, ARIZONA

Prepared for:

FREEPORT-MCMORAN SIERRITA INC.
6200 West Duval Mine Road
Green Valley, Arizona 85614

Prepared by:

CLEAR CREEK ASSOCIATES, P.L.C.
221 North Court Avenue
Tucson, Arizona 85701
(520) 622-3222

October 19, 2011

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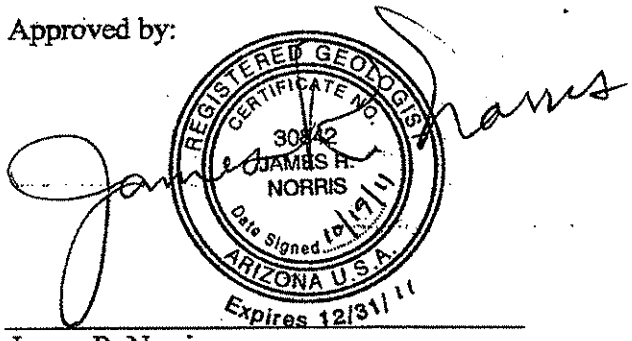
Approved by:



James R. Norris
Arizona Registered Geologist No. 30842

October 19, 2011

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1. INTRODUCTION

This report provides the results of groundwater monitoring conducted in the second and third quarters of 2011 in the vicinity of the Freeport-McMoRan Sierrita Inc. (Sierrita) Tailing Impoundment (STI). Monitoring was conducted by Sierrita to characterize groundwater sulfate concentrations and groundwater elevations in the vicinity of the STI. This semiannual groundwater monitoring report was prepared by Clear Creek Associates (CCA) on behalf of Sierrita.

1.1 Scope of Groundwater Monitoring

Quarterly groundwater monitoring pursuant to the Mitigation Order on Consent Docket No. P-50-06 has been conducted since the fourth quarter 2006 according to the specifications of the Work Plan (HGC, 2006a) submitted to and approved by Arizona Department of Environmental Quality (ADEQ). The purpose of the groundwater monitoring under the Work Plan was to document sulfate concentrations and water levels to determine the lateral and vertical extent of the sulfate plume and provide data for the development of conceptual and numerical models of the plume. Submittal of the Aquifer Characterization Report (HGC, 2009a), Feasibility Study (HGC, 2008) and Mitigation Plan (HGC, 2009b) fulfilled the objectives of monitoring recommended by the Work Plan.

In 2009, the groundwater monitoring requirements were revised in collaboration with ADEQ. The objectives of the revised groundwater monitoring plan are to track the location of the plume edge and monitor drinking water supply wells near the plume prior to implementation of the additional mitigation measures recommended in the Feasibility Study.

The details of the pre-implementation groundwater monitoring are outlined in letters from Sierrita to ADEQ on May 15, 2009 (Sierrita, 2009a) and June 12, 2009 (Sierrita, 2009b). Wells identified for annual, quarterly, and semiannual monitoring for pre-implementation groundwater monitoring are shown in Table 1 and Figure 1.

Groundwater sampling and analysis methods followed by Sierrita are described in the Quality Assurance Project Plan (QAPP) contained in Appendix E of the Work Plan (HGC, 2006a). Results of groundwater monitoring are presented in Section 2.1.

2. GROUNDWATER MONITORING

2.1 Monitoring Results

Analytical results and groundwater elevation data for the second and third quarters 2011 are tabulated in Table 2 and Table 3, respectively. Figure 2 shows the concentrations of dissolved sulfate in the wells sampled in the second quarter 2011. Figure 3 shows the dissolved sulfate concentrations in drinking water supply wells in the vicinity of the plume and their corresponding sentinel wells in the third quarter 2011. The highest sulfate concentration measured at co-located wells was used for concentration contouring. Groundwater elevations in the second and third quarters 2011 are presented on Figures 4 and 5, respectively. Groundwater elevations were calculated using the depth to water measurements taken under non-pumping conditions whenever possible. Groundwater elevations calculated from depth to water measurements taken during pumping are presented but not used for groundwater elevation contouring.

2.2 Quality Assurance/Quality Control Review

Pursuant to Section 6.4 of the QAPP, a data verification report was prepared for quality assurance and quality control purposes. The data verification report reviews groundwater data collected by Sierrita during the second and third quarters 2011, and is included as Appendix A. Analytical laboratory reports for samples collected in second and third quarters 2011 are provided in portable document format on the compact diskette in Appendix B. As determined by the analytical data verification review, all data are of acceptable quality for use in the groundwater monitoring program conducted pursuant to the Mitigation Order.

3. FINDINGS

This semiannual data report provides the results of groundwater monitoring conducted in the vicinity of the STI for the second and third quarters 2011 (Table 1). Groundwater samples and, if possible, depth to water measurements were collected from 69 plume area wells during the second quarter 2011. Depth to water measurements were collected from an additional 19 wells during the second quarter 2011. In the third quarter 2011 groundwater samples and, if possible, depth to water measurements were collected from 14 plume area wells.

All wells were sampled according to the schedule presented in the pre-implementation groundwater monitoring plan except IW-5, IW-16, IW-17, IW-18, and I-10. Well IW-5 was replaced by well IW-5A. IW-5A has been added to the schedule for annual sampling. Wells IW-16, IW-17, and IW-18 were decommissioned due to very low discharge rates. Water level measurement will be collected from the wells annually. Well I-10 was not sampled because it has no power source. Sierrita staff is investigating how to bring well I-10 online to begin collecting samples annually.

- Sulfate concentration data indicate that the sulfate plume from the STI (as defined by the 250 mg/L sulfate concentration contour) extends northeast from the southeastern corner of the tailing impoundment to the vicinity of co-located wells CW-3/MO-2007-5. The plume then extends north from wells CW-3/MO-2007-5 to the west of wells NP-2/MO-2007-3 and to Duval Mine Road, just north of the MO-2007-1 wells (Figures 2 and 3). Comparison of the second and third quarters 2011 sulfate concentration data with those collected in previous quarters indicates that the there has not been any significant change to the plume geometry.
- Appendix C presents time series graphs of sulfate concentrations for drinking water supply wells in the vicinity of the edge of the plume, sentinel wells between the plume and the drinking supply wells, and other monitoring wells that document the edge of the plume. The time series graphs for water supply wells CW-6, CW-9, CW-10, GV-01-GVDWID, and GV-02-GVDWID indicate that sulfate concentrations are steady over time and less than the interim action trigger level of 135 mg/L (HGC, 2006b).
- Sulfate concentrations reported for groundwater samples collected from sentinel wells NP-2, MO-2007-3B, MO-2007-4A, MO-2007-4B, MO-2007-4C, MO-2007-6A, and MO-2009-1 are steady over time and below 135 mg/L, which is the trigger level for more frequent monitoring at sentinel wells (Sierrita, 2009a). Sulfate concentrations at sentinel wells MO-2007-3C and MO-2007-6B are below 135 mg/L and decrease over time but are variable.
- Data presented in the time series graphs indicate that sulfate concentrations in wells along the edge of the plume are relatively steady or decline over time except at MO-2007-1B,

MO-2007-1C, and ESP-1. Sulfate concentrations increased at MO-2007-1B and MO-2007-1C which are positioned at the leading edge of the plume. The sulfate concentrations in MO-2007-1B and MO-2007-1C are expected to increase until the mitigation measures identified by the Feasibility Study and Mitigation Plan are implemented. Sulfate concentrations at ESP-1 are variable over time but have increased since 2008.

- Appendix D presents time series graphs of groundwater elevation at the sentinel wells. The time series graphs show that water levels at these wells are relatively steady over time. Groundwater elevations for the sentinel wells are generally slightly higher in the first and second quarter than during the third and fourth quarters.

4. REFERENCES

Hydro Geo Chem, Inc. (HGC). 2006a. Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Phelps Dodge Sierrita Tailing Impoundment, Pima County, Arizona. August 11, 2006, revised October 31, 2006.

HGC. 2006b. Interim Action Identification, Technical Memorandum for Mitigation Order on Consent Docket No. P-50-06, Pima County, Arizona. December 22, 2006.

HGC. 2008. Feasibility Study for Mitigation of Sulfate in the Vicinity of the Freeport-McMoRan Sierrita Inc. Tailing Impoundment, Mitigation Order on Consent Docket No. P-50-06. October 22, 2008.

HGC. 2009a. Revision 1, Aquifer Characterization Report, Task 5 of Aquifer Characterization Plan, Mitigation Order on Consent Docket No. P-50-06. Pima County, Arizona. January 30, 2009.

HGC. 2009b. Mitigation Plan for Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Freeport-McMoRan Sierrita Inc. Tailing Impoundment, Mitigation Order on Consent Docket No. P-50-06. May 8, 2009.

Sierrita. 2009a. Letter from Ned Hall (Sierrita) to Cynthia Campbell (ADEQ) Regarding Mitigation Order on Consent, Docket P-50-06, Response to ADEQ Comments on Recommended Groundwater Monitoring for Sulfate. May 15, 2009.

Sierrita. 2009b. Letter from Ned Hall (Sierrita) to Cynthia Campbell (ADEQ) Regarding Mitigation Order on Consent, Docket P-50-06, Supplemental Information on Recommended Groundwater Monitoring for Sulfate. June 12, 2009.

TABLES

TABLE 1
Sampling Schedule for Pre-Implementation Groundwater Monitoring

Well Name	ADWR 55 Well Registry No.	Owner	Annual Sampling Second Quarter	Quarterly Sampling Third Quarter	Semiannual Sampling Fourth Quarter	Quarterly Sampling First Quarter
CC of GV	501760	Sierrita	✓			
CW-3	627483	CWC	✓		✓	
CW-6	627485	CWC	✓	✓	✓	✓
CW-7	502546	CWC	WLO			
CW-8	543600	CWC	WLO			
CW-9	588121	CWC	✓	✓	✓	✓
CW-10	207982	CWC	✓	✓	✓	✓
ESP-1	623102	Sierrita	✓		✓	
ESP-2	623103	Sierrita	✓		✓	
ESP-3	623104	Sierrita	✓		✓	
ESP-4	623105	Sierrita	✓		✓	
ESP-5	623106	Sierrita	WLO			
GV-01-GVDWID	603428	GVDWID	✓	✓	✓	✓
GV-02-GVDWID	603429	GVDWID	✓	✓	✓	✓
GV-SI-GVDWID	208825	GVDWID	✓			
HAVEN GOLF	515867	Haven Golf	✓			
I-10	608525	TBPI	✓			
IW-1	623129	Sierrita	✓			
IW-2A	216464	Sierrita	✓			
IW-3A	623131	Sierrita	✓			
IW-4	623132	Sierrita	✓			
IW-5A	623133	Sierrita	✓			
IW-6A	545565	Sierrita	✓			
IW-8	508236	Sierrita	✓			
IW-9	508238	Sierrita	✓			
IW-10	508237	Sierrita	✓			
IW-11	508235	Sierrita	✓			
IW-12	545555	Sierrita	✓			
IW-13	545556	Sierrita	✓			
IW-14	545557	Sierrita	✓			
IW-15	545558	Sierrita	✓			
IW-16	545559	Sierrita	WLO			
IW-17	545560	Sierrita	WLO			
IW-18	545561	Sierrita	WLO			
IW-19	545562	Sierrita	✓			
IW-20	545563	Sierrita	✓			

TABLE 1
Sampling Schedule for Pre-Implementation Groundwater Monitoring

Well Name	ADWR 55 Well Registry No.	Owner	Annual Sampling Second Quarter	Quarterly Sampling Third Quarter	Semiannual Sampling Fourth Quarter	Quarterly Sampling First Quarter
IW-21	545564	Sierrita	✓			
IW-22	200554	Sierrita	✓			
IW-23	200555	Sierrita	✓			
IW-24	200556	Sierrita	✓			
M-8	87390	TBPI	✓		✓	
M-9	501652	TBPI	✓			
M-10	501653	TBPI	✓		✓	
M-20	906595	TBPI	✓			
MH-1	803629	Sierrita	WLO			
MH-3	803630	Sierrita	WLO			
MH-5	803632	Sierrita	WLO			
MH-6	803633	Sierrita	WLO			
MH-7	803634	Sierrita	WLO			
MH-9	803635	Sierrita	WLO			
MH-10	803636	Sierrita	✓			
MH-11	803637	Sierrita	✓			
MH-13A	904071	Sierrita	✓			
MH-13B	904072	Sierrita	✓			
MH-13C	904073	Sierrita	✓			
MH-14	528098	Sierrita	WLO			
MH-15E	528094	Sierrita	WLO			
MH-15W	528093	Sierrita	WLO			
MH-16E	528100	Sierrita	WLO			
MH-16W	528099	Sierrita	WLO			
MH-24	563799	Sierrita	WLO			
MH-25A	201528	Sierrita	✓			
MH-25B	208429	Sierrita	✓			
MH-25C	208426	Sierrita	✓			
MH-26A	201527	Sierrita	✓			
MH-26B	208427	Sierrita	✓			
MH-26C	208428	Sierrita	✓			
MH-28	903648	Sierrita	✓		✓	
MH-29	903649	Sierrita	✓		✓	
MH-30	903884	Sierrita	✓			
MO-2007-1A	907342	Sierrita	✓		✓	
MO-2007-1B	907210	Sierrita	✓		✓	

TABLE 1
Sampling Schedule for Pre-Implementation Groundwater Monitoring

Well Name	ADWR 55 Well Registry No.	Owner	Annual Sampling Second Quarter	Quarterly Sampling Third Quarter	Semiannual Sampling Fourth Quarter	Quarterly Sampling First Quarter
MO-2007-1C	907209	Sierrita	✓		✓	
MO-2007-2	906765	Sierrita	✓			
MO-2007-3B[1]	906816	Sierrita	✓	✓	✓	✓
MO-2007-3C[1]	906817	Sierrita	✓	✓	✓	✓
MO-2007-4A[2]	907213	Sierrita	✓	✓	✓	✓
MO-2007-4B[2]	907212	Sierrita	✓	✓	✓	✓
MO-2007-4C[2]	907211	Sierrita	✓	✓	✓	✓
MO-2007-5B	907456	Sierrita	✓		✓	
MO-2007-5C	907457	Sierrita	✓		✓	
MO-2007-6A[3]	907607	Sierrita	✓	✓	✓	✓
MO-2007-6B[3]	907606	Sierrita	✓	✓	✓	✓
MO-2009-1[4]	910458	Sierrita	✓	✓	✓	✓
NP-2[1]	605898	CWC	✓	✓	✓	✓
PZ-7	561870	Sierrita	✓			
PZ-8	561866	Sierrita	✓			
TMM-1	616156	Pima County	✓		✓	
1350	ND	TBPI	WLO			

Notes:

ADWR = Arizona Department of Water Resources
CC OF GV = Country Club of Green Valley
CWC = Community Water Company of Green Valley
GVDWID = Green Valley Domestic Water Improvement District
ND = No Data
Sierrita = Freeport-McMoRan Sierrita Inc.
TBPI = Twin Buttes Properties, Inc.
WLO = Water Level Only

[1] *Sentinel Well for CW-9*
[2] *Sentinel Well for CW-6*
[3] *Sentinel Well for GV-01-GVDWID and GV-02-GVDWID*
[4] *Sentinel Well for CW-10*

TABLE 2
Analytical Results for Second and Third Quarters 2011 Groundwater Monitoring

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temperature (deg C)	Specific Conductance (µS/cm)	Sulfate, Dissolved (mg/L)
CC of GV	501760	4/21/11	6.95	17.6	494	82
CW-3	627483	5/2/11	7.55	26.4	390	56.8
CW-6	627485	4/28/11	7.66	25.2	453	58.1
		7/20/11	7.52	25.5	417	81
CW-9	588121	4/28/11	7.68	28.8	377	44.4
		7/20/11	7.71	27.8	379	43.9
CW-10	207982	4/28/11	7.54	27.9	372	49.6
		7/20/11	7.72	31.4	383	50.7
ESP-1	623102	5/3/11	7.51	28.1	1060	359
ESP-2	623103	5/3/11	7.72	27.8	361	28.1
		5/3/11 DUP	7.72	27.8	361	28.1
ESP-3	623104	5/3/11	7.82	27.2	362	35.1
ESP-4	623105	5/3/11	7.54	27.1	1465	595
GV-01-GVDWID	603428	4/28/11	7.30	27.5	421	42.9
		7/20/11	6.88	27.1	429	39.6
GV-02-GVDWID	603429	4/28/11	7.43	24.5	612	87.3
		7/20/11	7.35	24.0	624	87.2
GV-SI-GVDWID	208825	4/28/11	7.57	27.1	364	6.0
HAVEN GOLF	515867	4/21/11	7.10	20.4	588	95
IW-1	623129	5/11/11	7.02	27.1	2110	1050
IW-2A	216464	5/11/11	7.12	26.7	541	87
		5/11/11 DUP	7.12	26.7	541	88
IW-3A	623131	5/11/11	6.75	25.6	2260	1650
IW-4	623132	5/11/11	6.57	25.8	3070	1700
IW-5A	219131	4/20/11	6.78	22.2	3210	1740
IW-6A	545565	5/11/11	6.82	23.4	3390	1900
IW-8	508236	5/11/11	6.67	23.9	1965	1900
IW-9	508238	5/26/11	6.95	26.2	3850	1810
IW-10	508237	5/11/11	6.67	24.3	3310	1800
IW-11	508235	5/11/11	6.51	25.0	3250	1700
IW-12	545555	5/11/11	6.74	25.8	3120	1700
IW-13	545556	5/11/11	6.70	25.3	3360	1900
IW-14	545557	5/11/11	7.54	25.7	3460	1900
IW-15	545558	5/11/11	7.54	26.2	3270	1800
		5/11/11 DUP	7.54	26.2	3270	1800
IW-19	545562	5/11/11	6.68	26.6	3200	1700
IW-20	545563	5/11/11	7.07	26.3	3080	1600
IW-21	545564	5/11/11	6.77	29.6	3140	1700
IW-22	200554	5/11/11	6.75	24.5	3290	1800
IW-23	200555	5/11/11	6.83	24.6	3280	1800
IW-24	200556	5/11/11	6.76	24.6	3260	1700
M-8	087390	6/15/11	7.57	26.1	501	59.3
M-9	501652	6/2/11	7.59	27.1	525	75
M-10	501653	5/10/11	7.86	28.9	641	149
M-20	906595	5/9/11	7.29	27.8	2790	1710
MH-10	803636	5/18/11	7.03	27.4	2900	1600
MH-11	803637	5/24/11	6.77	27.4	2650	1500

TABLE 2
Analytical Results for Second and Third Quarters 2011 Groundwater Monitoring

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temperature (deg C)	Specific Conductance (µS/cm)	Sulfate, Dissolved (mg/L)
MH-13A	904071	5/23/11	7.12	26.9	3450	1840
MH-13B	904072	5/23/11	7.28	28.3	2400	1090
		5/23/11 DUP	7.28	28.3	2400	1110
MH-13C	904073	5/23/11	8.65	30.4	364	43
MH-25A	201528	4/27/11	7.76	25.9	358	16
MH-25B	208429	4/27/11	7.35	27.0	3050	1810
		6/15/2011[1]	7.31	29.3	3690	1700
MH-25C	208426	4/27/11	8.41	25.1	1874	1290
MH-26A	201527	4/27/11	7.78	25.7	357	8
		4/27/11 DUP	7.78	25.7	357	9
MH-26B	208427	5/5/11	7.17	27.2	2910	1710
MH-26C	208428	4/27/11	7.59	29.1	1755	810
MH-28	903548	5/17/11	6.94	25.6	3380	2000
MH-29	903649	4/20/11	6.98	26.0	2950	1790
		4/20/11 DUP	6.98	26.0	2950	1770
MH-30	903884	5/17/11	6.95	27.5	3360	1760
		5/17/11 DUP	6.95	27.5	3360	1750
MO-2007-1A	907342	5/5/11	7.51	27.4	401	17.9
MO-2007-1B	907210	5/5/11	7.42	28.6	1214	479
MO-2007-1C	907209	4/20/11	7.28	29.2	1009	381
MO-2007-2	906765	4/27/11	7.27	28.7	1249	507
		4/27/11 DUP	7.27	28.7	1249	503
MO-2007-3B	906816	5/4/11	7.81	29.3	359	38.1
		7/6/11	7.75	30.2	362	38.3
MO-2007-3C	906817	5/4/11	8.11	30.4	504	107
		7/6/11	8.02	32.5	248	101
MO-2007-4A	907213	5/4/11	7.57	26.5	411	35.9
		7/6/11	7.47	27.4	417	35.3
MO-2007-4B	907212	5/4/11	7.72	28.1	379	34.5
		7/6/11	7.73	28.0	381	34.4
MO-2007-4C	907211	5/4/11	8.27	30.1	468	88.1
		7/6/11	8.17	30.8	468	85
MO-2007-5B	907456	6/24/11	7.98	31.0	1199	513
MO-2007-5C	907457	5/24/11	7.76	29.7	682	238
MO-2007-6A	907607	5/5/11	7.59	29.0	384	29.2
		7/7/11	7.72	29.1	397	36.6
		7/7/11 DUP	7.72	29.1	397	37.1
MO-2007-6B	907606	5/5/11	7.84	32.8	404	57.2
		7/7/11	7.88	32.8	405	57.5
MO-2009-1	910458	6/16/11	8.30	32.7	468	102
		8/31/11	8.33	31.1	560	108
NP-2	605898	5/3/11	7.84	25.3	413	43.5
		7/18/11	7.72	25.8	431	44.8
		7/18/11 DUP	7.72	25.8	431	44.6
PZ-7	561870	5/18/11	7.04	24.2	1463	472
		5/18/11 DUP	7.04	24.2	1463	470

TABLE 2
Analytical Results for Second and Third Quarters 2011 Groundwater Monitoring

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temperature (deg C)	Specific Conductance (µS/cm)	Sulfate, Dissolved (mg/L)
PZ-8	561866	4/21/11	7.05	21.5	1147	364
TMM-1	616156	4/21/11	7.96	26.8	303	11.6

Notes:
ADWR = Arizona Department of Water Resources
SU = Standard Units
deg C = degrees Celsius
µS/cm = microsiemens per centimeter
mg/L = milligrams per Liter
DUP = Duplicate sample
[1]Confirmation sample was collected due to abnormal result from first sample

TABLE 3
Groundwater Elevation Data for Second and Third Quarters 2011

Well Name	ADWR 55 Registry No.	Survey Source	UTM North (m)	UTM East (m)	Measuring Point Elevation (ft amsl)	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)
1350	ND	TBPI	3528452.906	499357.609	3033.25	5/9/11	480.42	2552.83
CW-3	627483	HGC	3523809.985	500047.663	2941.71	5/2/11	272.50	2669.21
CW-6	627485	CWC	3525794.239	500891.072	2867.00	4/28/11	254.32	2612.68
						7/20/11	257.20	2609.80
CW-7	502546	CWC	3528094.155	499659.842	2987.50	4/28/11	429.50	2558.00
CW-8	543600	CWC	3525661.191	499798.520	2957.50	4/28/11	342.68	2614.82
CW-9	588121	CWC	3528740.784	501072.040	2834.30	4/28/11	313.41	2520.89
						7/20/11	315.45	2518.85
CW-10	207982	CWC	3523455.502	500913.364	2868.50	4/28/11	196.15	2672.35
						7/20/11	199.75	2668.75
ESP-1	623102	Sierrita	3526448.677	499969.682	2953.43	5/3/11	355.79	2597.64
ESP-2	623103	Sierrita	3526924.656	500241.637	2934.60	5/3/11	345.44	2589.16
ESP-3	623104	Sierrita	3527377.239	500234.067	2935.80	5/3/11	363.35	2572.45
ESP-4	623105	Sierrita	3526132.758	499916.830	2958.60	5/3/11	355.65	2602.95
ESP-5	623106	Sierrita	3527082.232	502007.895	2820.00	5/3/11	224.15	2595.85
GV-01-GVDWID	603428	GVDWID	3522254.157	499812.869	2942.35	4/28/11	231.00	2711.35
GV-02-GVDWID	603429	GVDWID	3521654.457	499786.207	2930.47	4/28/11	204.77	2725.70
						7/20/11	206.14	2724.33
GV-SI-GVDWID	208825	HGC	3519509.930	497227.175	3042.65	4/28/11	257.00	2785.65
IW-1	623129	Sierrita	3521277.779	496905.892	3144.69	5/11/11	392.80	2751.89
IW-2A	216464	Sierrita	3521337.953	497469.228	3112.28	5/11/11	394.91	2717.37
IW-3A	201732	Sierrita	3521722.640	497366.220	3121.45	5/11/11	413.40	2708.05
IW-4	623132	Sierrita	3522465.879	497371.700	3137.06	5/11/11	414.25	2722.81
IW-6A	545565	Sierrita	3523708.756	497381.226	3132.26	5/11/11	410.61	2721.65
IW-8	508236	Sierrita	3522020.520	497368.253	3122.19	5/11/11	430.52	2691.67
IW-9	508238	Sierrita	3522207.639	497369.791	3102.94	5/26/11	503.43	2599.51
IW-10	508237	Sierrita	3523122.199	497370.367	3129.64	5/11/11	456.68	2672.96
IW-11	508235	Sierrita	3523428.954	497371.414	3127.20	5/11/11	414.21	2712.99
IW-12	803638	Sierrita	3523969.869	497364.911	3138.18	5/11/11	415.81	2722.37
IW-13	545556	Sierrita	3524166.673	497363.820	3143.35	5/11/11	401.85	2741.50
IW-14	545557	Sierrita	3526924.656	497367.126	3146.42	5/11/11	404.48	2741.94
IW-15	545558	Sierrita	3526924.656	497372.873	3152.02	5/11/11	414.82	2737.20
IW-16	545559	Sierrita	3526924.656	497370.651	3162.85	6/29/11	339.30	2823.55
IW-17	545560	Sierrita	3525002.869	497373.717	3160.76	6/29/11	422.10	2738.66

TABLE 3
Groundwater Elevation Data for Second and Third Quarters 2011

Well Name	ADWR 55 Registry No.	Survey Source	UTM North (m)	UTM East (m)	Measuring Point Elevation (ft amsl)	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)
IW-18	545561	Sierrita	3525169.771	497374.056	3171.15	6/29/11	435.35	2735.80
IW-19	545562	Sierrita	3525343.392	497373.630	3155.39	5/11/11	436.15	2719.24
IW-20	545563	Sierrita	3525568.770	497364.739	3164.21	5/11/11	413.15	2751.06
IW-21	545664	Sierrita	3525773.266	497374.585	3171.37	5/11/11	736.00	2435.37
IW-22	200554	Sierrita	3523273.592	497369.590	3128.25	5/11/11	431.21	2697.04
IW-23	200555	Sierrita	3522970.788	497369.237	3128.53	5/11/11	516.15	2612.38
IW-24	200556	Sierrita	3522633.594	497371.670	3113.29	5/11/11	456.05	2657.24
M-8	87390	Sierrita	3529692.237	499658.916	2999.53	6/15/11	467.35	2532.18
M-9	501652	Sierrita	3530303.954	499984.173	2973.81	6/2/11	452.35	2521.46
M-10	501653	Sierrita	3530143.114	499659.027	3005.68	5/10/11	478.33	2527.35
M-20	906595	TBPI	3528491.771	499082.070	3054.00	5/9/11	499.14	2554.86
MH-1	803629	Sierrita	3525872.911	497372.392	3179.27	4/19/11	436.65	2742.62
MH-3	803630	Sierrita	3525270.181	497472.430	3155.87	4/19/11	420.10	2735.77
MH-5	803632	Sierrita	3523725.339	497477.352	3123.47	4/18/11	387.96	2735.51
MH-6	803633	Sierrita	3522770.451	497436.646	3133.97	5/17/11	387.85	2746.12
MH-7	803634	Sierrita	3522016.471	497502.475	3111.23	4/18/11	368.76	2742.47
MH-9	803635	Sierrita	3521252.607	496438.181	3162.57	4/19/11	375.11	2787.46
MH-10	803636	Sierrita	3521236.861	495717.770	3187.84	5/18/11	363.39	2824.45
MH-11	803637	Sierrita	3524463.648	498749.381	3041.76	5/24/11	376.65	2665.11
MH-13A	904071	Sierrita	3523793.443	498823.857	3026.23	5/23/11	334.40	2691.83
MH-13B	904072	Sierrita	3523787.358	498829.881	3025.63	5/23/11	338.75	2686.88
MH-13C	904073	Sierrita	3523793.032	498797.461	3028.46	5/23/11	344.30	2684.16
MH-14	528098	Sierrita	3525269.340	497517.626	3153.46	4/19/11	418.94	2734.52
MH-15E	528094	Sierrita	3523274.327	497584.800	3111.37	4/18/11	382.69	2728.68
MH-15W	528093	Sierrita	3523275.003	497524.067	3117.07	5/17/11	388.95	2728.12
MH-16E	528100	Sierrita	3521870.233	497576.673	3097.72	4/18/11	354.93	2742.79
MH-16W	528099	Sierrita	3521870.818	497516.074	3100.24	5/17/11	357.55	2742.69
MH-24	563799	Sierrita	3523709.046	497390.515	3131.16	4/18/11	392.84	2738.32
MH-25A	201528	Sierrita	3526510.175	498880.349	3056.57	4/27/11	459.25	2597.32
MH-25B	208429	Sierrita	3526515.244	498870.343	3058.22	4/27/11	460.35	2597.87
						6/15/11	460.85	2597.37
MH-25C	208426	Sierrita	3526491.132	498874.666	3057.24	4/27/11	459.16	2598.08
						6/15/11	459.52	2597.72
MH-26A	201527	Sierrita	3527818.233	498852.692	3070.89	4/27/11	500.71	2570.18

TABLE 3
Groundwater Elevation Data for Second and Third Quarters 2011

Well Name	ADWR 55 Registry No.	Survey Source	UTM North (m)	UTM East (m)	Measuring Point Elevation (ft amsl)	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)
MH-26B	208427	Sierrita	3527814.016	498839.900	3070.50	5/5/11	497.73	2572.77
MH-26C	208428	Sierrita	3527806.770	498865.240	3069.11	4/27/11	499.14	2569.97
MH-28	903548	Sierrita	3524609.980	497471.427	3142.18	5/17/11	396.89	2745.29
MH-29	903649	Sierrita	3522805.518	497604.326	3123.15	4/20/11	377.75	2745.40
						5/23/11	377.80	2745.35
MH-30	903884	Sierrita	3525926.812	496682.307	3232.45	5/17/11	412.18	2820.27
MO-2007-1A	907342	Sierrita	3529331.380	500016.947	2967.65	5/5/11	429.31	2538.34
MO-2007-1B	907210	Sierrita	3529325.119	500021.574	2966.82	5/5/11	429.65	2537.17
MO-2007-1C	907209	Sierrita	3529328.959	500013.405	2968.58	4/20/11	427.32	2541.26
MO-2007-2	906765	Sierrita	3527621.102	497912.410	3153.83	4/27/11	581.41	2572.42
MO-2007-3B	906816	Sierrita	3528508.801	500522.491	2912.15	5/4/11	361.59	2550.56
						7/6/11	363.80	2548.35
MO-2007-3C	906817	Sierrita	3528508.743	500529.713	2911.90	5/4/11	361.61	2550.29
						7/6/11	363.75	2548.15
MO-2007-4A	907213	Sierrita	3525634.956	500383.682	2923.63	5/4/11	309.68	2613.95
						7/6/11	311.75	2611.88
MO-2007-4B	907212	Sierrita	3525613.952	500380.947	2923.57	5/4/11	310.40	2613.17
						7/6/11	312.85	2610.72
MO-2007-4C	907211	Sierrita	3525624.484	500382.217	2923.66	5/4/11	311.53	2612.13
						7/6/11	314.05	2609.61
MO-2007-5B	907456	Sierrita	3523743.376	500013.850	2944.35	6/24/11	275.70	2668.65
MO-2007-5C	907457	Sierrita	3523736.459	500014.152	2944.91	5/24/11	278.21	2666.70
MO-2007-6A	907607	Sierrita	3521842.050	498367.161	3043.37	5/5/11	308.13	2735.24
						7/7/11	309.90	2733.47
MO-2007-6B	907606	Sierrita	3521849.495	498367.887	3043.05	5/5/11	317.00	2726.05
						7/7/11	318.58	2724.47
MO-2009-1	910458	Sierrita	3523369.438	500534.089	2890.78	6/16/11	226.45	2664.33
						8/31/11	223.97	2666.81
NP-2	605898	HGC	3528517.116	500582.904	2906.56	5/3/11	358.30	2548.26
						7/18/11	359.72	2546.84
PZ-7	561870	Sierrita	3526357.485	492533.171	3549.17	5/18/11	140.62	3408.55
PZ-8	561866	Sierrita	3524196.243	492972.681	3480.36	4/19/11	228.73	3251.63

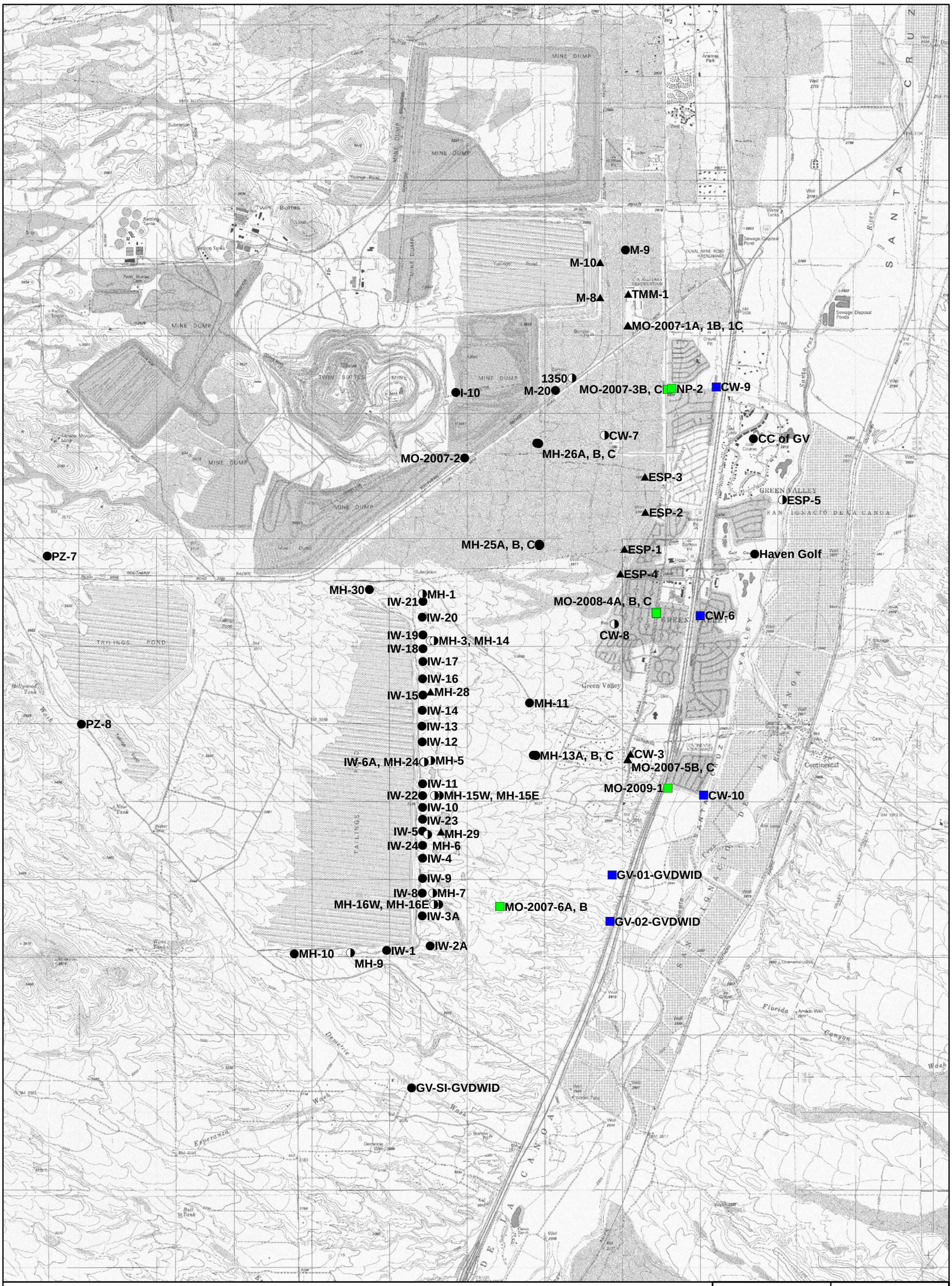
TABLE 3
Groundwater Elevation Data for Second and Third Quarters 2011

Well Name	ADWR 55 Registry No.	Survey Source	UTM North (m)	UTM East (m)	Measuring Point Elevation (ft amsl)	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)
TMM-1	616156	HGC	3529736.231	500018.323	2967.08	4/21/11	437.13	2529.95

Notes:

ADWR = Arizona Department of Water Resources
CC OF GV = Country Club of Green Valley
CWC = Community Water Company of Green Valley
ft amsl = feet above mean sea level
GVDWID = Green Valley Domestic Water Improvement District
HGC = Hydro Geo Chem, Inc.
m = meters
ND = No Data
Sierrita = Freeport-McMoRan Sierrita Inc.
TBPI = Twin Buttes Properties, Inc.
UTM = Universal Transverse Mercator, Zone 12 North American Datum 1983 (NAD83)

FIGURES



Legend

- ● Annual Sampling
- ◑ Annual Water Level Only
- ▲ Semi-Annual Sampling
- Quarterly Sampling - Sentinel Well
- Quarterly Sampling - Drinking Water Supply Well

Scale

0 2,000 4,000 8,000

Feet

Date	File ID
1/20/10	055038-006A

CLEAR CREEK ASSOCIATES

Figure 1
Sampling Locations for
Pre-Implementation Groundwater
Monitoring

M-9 75
M-10 149
M-8 59.3
TMM-1 11.6
MO-2007-1A, 1B, 1C
460-600 17.9
740-900 479
1020-1180 381
NP-2, MO-2007-3B, 3C
331-500 43.5
740-940 38.1
1160-1320 107
MH-26A, 26B, 26C
418-538 8 / 9
620-730 1710
780-900 810
M-20 1710
CW-9 44.4
CC of GV 82
MO-2007-2 507 / 503
ESP-3 35.1
ESP-2 28.1 / 28.1
MH-25A, 25B, 25C
410-530 16
580-680 1700
731-901, 951-1081 1290
ESP-1 359
Haven Golf 95
PZ-7 472 / 470
ESP-4 595
MH-30 1760 / 1750
IW-21 1700
IW-20 1600
IW-19 1700
CW-6 58.1
MO-2007-4A, 4B, 4C
360-560 35.9
669-939 34.5
1090-1130 88.1
MH-13A, 13B, 13C
300-650 1840
750-950 1090 / 1110
1050-1350 43
IW-15 1800 / 1800
MH-28 2000
MH-11 1500
IW-14 1900
IW-13 1900
PZ-8 364
IW-12 1700
IW-6A 1900
CW-3, MO-2007-5B, 5C
182-500 56.8
660-960 513
1050-1350 238
MO-2009-1 102
CW-10 49.6
IW-11 1700
IW-22 1800
IW-10 1800
IW-23 1800
MH-29 1790 / 1770
IW-24 1700
IW-4 1700
GV-01-GVDWID 42.9
IW-9 1810
IW-8 1900
GV-02-GVDWID 87.3
IW-3A 1650
MH-10 1600
IW-2A 87 / 88
IW-1 1050
MO-2007-6A, 6B
310-390, 430-610 29.2
780-940 57.2
GV-SI-GVDWID 6.0

100 250 500 1000 1500 50

Legend

Sulfate Concentration Contour (mg/L)
(dashed where inferred)

IW-10 Well ID
1800 Sulfate Concentration (mg/L)
Duplicate results separated by "/"

Well Symbols
- Well
- Sentinel Well
- Drinking Water Supply Well

Scale
0 2,000 4,000 8,000
Feet

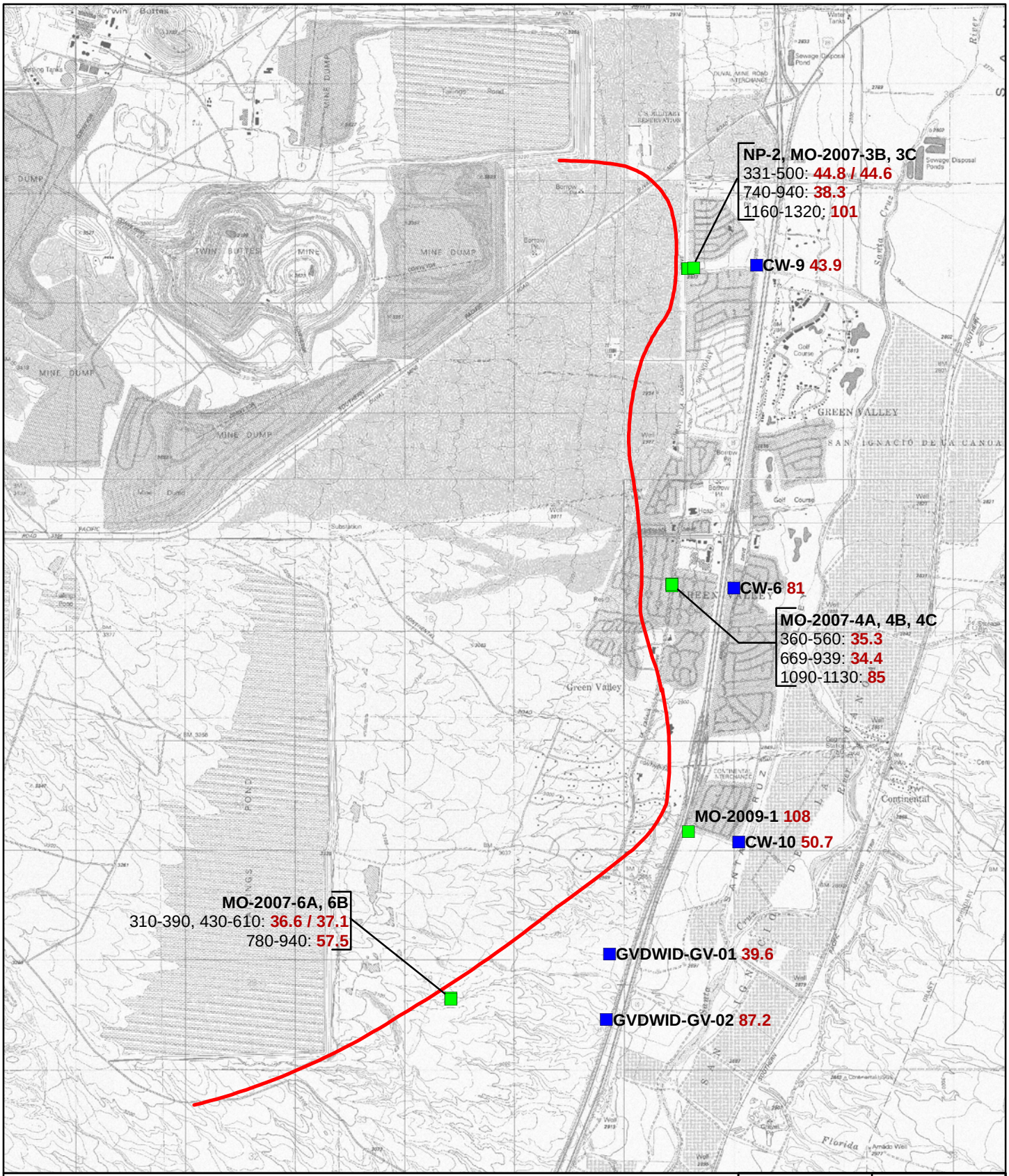
Co-Located Wells
Screened Interval (ft bls): **Sulfate Concentration (mg/L)**

Notes:
Projection:UTM NAD83 Zone 12N

Date: 8/29/11
File ID: 055039-061

CLEAR CREEK ASSOCIATES

Figure 2
Sulfate Concentrations
in Groundwater
Second Quarter 2011



Legend

250 mg/L Sulfate Concentration Contour

CW-9 Well ID
43.9 Sulfate Concentration (mg/L)
Duplicate Results Separated by "/"

Co-Located Wells
Screened Interval (ft bls): **Sulfate Concentration (mg/L)**

Well Symbols
Water Supply Well
Sentinel Well

0 2,000 4,000
Feet

CLEAR CREEK ASSOCIATES

File ID 055039-063
Date 9/13/10

Figure 3
Sulfate Concentrations
in Groundwater
for Third Quarter 2011

M-10 2527.35
M-8 2532.18
TMM-1 2529.95
MO-2007-1A, 1B, 1C
460-600 2538.34
740-900 2537.17
1020-1180 2541.26
NP-2, MO-2007-3B, 3C
331-500 2548.26
740-940 2550.56
1160-1320 2550.29
MH-26A, 26B, 26C
418-538 2570.18
620-730 2572.77
780-900 2569.97
1350 2552.83
M-20 2554.86
CW-9 2520.89
CW-7 2558.00
MO-2007-2 2572.42
ESP-3 2572.45
ESP-5 2595.85
ESP-2 2589.16
MH-25A, 25B, 25C
410-530 2597.32
580-680 2597.37
731-901, 951-1081 2597.72
ESP-1 2597.64
PZ-7 3408.55
ESP-4 2602.95
MH-30 2820.27
MH-1 2742.62
IW-21 2435.37
IW-20 2751.06
CW-6 2612.68
CW-8 2614.82
IW-19 2719.24
MH-3 2735.77
IW-18 2735.80
MH-14 2734.52
IW-17 2738.66
MO-2007-4A, 4B, 4C
360-560 2613.95
669-939 2613.17
1090-1130 2612.13
IW-16 2823.55
MH-13A, 13B, 13C
300-650 2691.83
750-950 2686.88
1050-1350 2684.16
IW-15 2737.20
MH-28 2745.29
MH-11 2665.11
IW-14 2741.94
CW-3, MO-2007-5B, 5C
182-500 2669.21
660-960 2668.65
1050-1350 2666.70
PZ-8 3251.63
IW-13 2741.50
IW-12 2722.37
IW-6A 2721.65
MH-24 2738.32
MH-5 2735.51
MO-2009-1 2664.33
IW-11 2712.99
IW-22 2697.04
MH-15W 2728.12, MH-15E 2728.68
CW-10 2672.35
IW-10 2672.96
IW-23 2612.38
MH-6 2746.12
MH-29 2745.40
IW-24 2657.24
IW-4 2722.81
GV-01-GVDWID 2711.35
IW-9 2599.51
IW-8 2691.67
MH-7 2742.47
MH-16W 2742.69, MH-16E 2742.79
IW-3A 2708.05
GV-02-GVDWID 2725.70
MH-9 2787.46
IW-2A 2717.37
MH-10 2824.45
IW-1 2751.89
MO-2007-6A, 6B
310-390, 430-610 2735.24
780-940 2726.05
GV-SI-GVDWID 2785.65
3400
3300
3200
3100
3000
2900
2540
2560
2580
2600
2620
2640
2660
2680
2700
2720
2740
2760
2780
2800

Legend

- CW-3 — Well ID
- 2669.21 — Groundwater Elevation ft (amsl)

Well Symbols

- Well
- Sentinel Well
- Drinking Water Supply Well

Co-Located Wells
Screened Interval (ft bls): Grounwater Elevation (ft amsl)

Scale
0 2,000 4,000 8,000
Feet

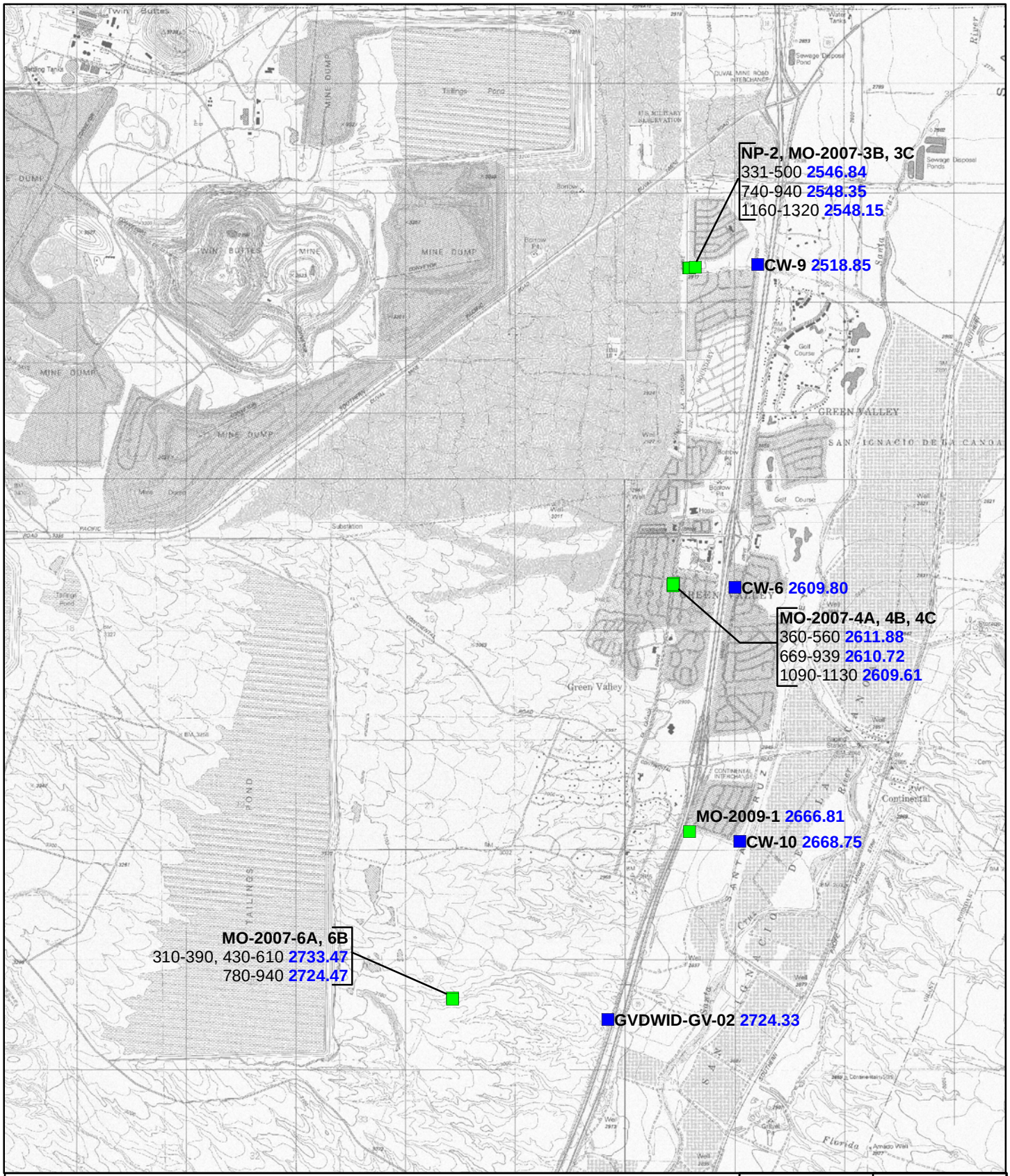
Notes:

Projection:UTM NAD83 Zone 12N
IW Wells not used for contouring

Date	File ID
8/29/11	055039-060

CLEAR CREEK ASSOCIATES

Figure 4
Groundwater Elevations for
Second Quarter 2011



Legend

CW-9 Well ID
2520.67 Grounwater Elevation (ft amsl)

Well Symbols
- Water Supply Well
- Sentinel Well

0 2,000 4,000
Feet

Co-Located Wells
Screened Interval (ft bls): **Grounwater Elevation (ft amsl)**

CLEAR CREEK ASSOCIATES

File ID 055039-064
Date 9/13/11

Figure 5
Grounwater Elevations
for Third Quarter 2011

APPENDIX A

DATA VERIFICATION REPORT

GROUNDWATER SAMPLES COLLECTED BY FREEPORT-MCMORAN SIERRITA INC. DURING SECOND AND THIRD QUARTERS 2011

APPENDIX A

DATA VERIFICATION REPORT

GROUNDWATER SAMPLES COLLECTED BY FREEPORT-MCMORAN SIERRITA INC. DURING THE SECOND AND THIRD QUARTERS 2011

Prepared for:

FREEPORT-MCMORAN SIERRITA INC.
6200 West Duval Mine Road
Green Valley, Arizona 85614

Prepared by:

Clear Creek Associates, P.L.C.
221 North Court Avenue Suite 101
Tucson, Arizona 85701

October 19, 2011

TABLE OF CONTENTS

1. INTRODUCTION

This report summarizes the data verification review of groundwater samples collected and analyzed during the second and third quarters 2011 by Freeport-McMoRan Sierrita Inc. (Sierrita) pursuant to Mitigation Order on Consent Docket No. P-50-06. All analytical results for groundwater samples collected during this reporting period were provided to Sierrita by ACZ Laboratories, Inc. (ACZ) for preparation of the Semiannual Groundwater Monitoring Report.

This report does not review field sampling or sample handling procedures for Sierrita. Sierrita collected samples following the methods in the *Quality Assurance/Quality Control (QA/QC) Plan for Water Monitoring, Phelps Dodge Sierrita, Inc.* (PDSI, 2005) in Appendix E of the Work Plan (Hydro Geo Chem, Inc. [HGC], 2006). Additionally, laboratory QA/QC data are evaluated according to the data quality indicators (DQIs) given in the Quality Assurance Project Plan (QAPP) (HGC, 2006).

Appendix B of the main text of this report contains laboratory reports for samples collected by Sierrita including COC forms, laboratory correspondence, QC summaries, data qualifiers, and any case narratives. The analytical results for all 99 samples collected are contained in 22 reports having the ACZ Project numbers identified in the following table.

The results of the internal QA/QC tests performed by ACZ also are presented with the laboratory reports included in Appendix B. Based on the results of surrogate spike recoveries, matrix spike/recovery and matrix spike duplicate tests, ACZ did not advise of any modifications that should be made regarding the usability and data validation status of the laboratory test results.

ACZ Project ID	Wells Reported
Second Quarter 2011 Number of well samples collected: 73 Number of duplicate samples collected: 9 Total number of samples collected: 85	
L87564	MH-14, MH-29, DUP20110420A
L87565	IW-5A
L87566	MO-2007-1C, HAVENGOLF, CCGV, PZ-8, TMM-1
L87663	MO-2007-2, CW-10, CW-6, CW-9, GV-1, GV-2, SIWELL, DUP20110427A
L87662	MH-26C, MH-26A, MH-25B, MH-25A, DUP20110427B
L87757	CW-3, ESP-2, ESP-3, ESP-1, ESP-4, NP-2, MO2007-4C, MO-2007-4B, MO-2007-4A, MO-2007-3C, MO-2007-3B, M0-2007-6A, MO-2007-6B, MO-2007-1A, MO-2008-1B, DUP20110503B
L87758	MH-26B
L87877	PZ-8 (RERUN)
L87887	M-20
L87888	M-10
L87890	IW-1, IW-2A, IW-3A, IW-8, IW-4, IW-24, IW-23, IW-10, IW-22, IW-11, IW-6A, IW-12, IW-13, IW-14, IW-15, IW-19, IW-20, IW-21, DUP20110511A, DUP20110511B
L88051	MH-28, MH-16W, MH-15W, FB20110518A, EQB20110518A
L88052	MH-10
L88054	MH-30, PZ-7, DUP20110517A, DUP20110518A
L88205	MH-13B, MH-13A, MH-13C, MH-11, MO-2007-5C, IW-9, DUP20110523A
L88310	M-9
L88606	M-8
L88607	MH-25B, MH-25C, M0-2009-1
L88841	MO-2007-5B
Third Quarter 2011 Number of well samples collected: 14 Number of duplicate samples collected: 2 Total number of samples collected: 16	
L89096	MO-2007-4C, MO-2007-4B, MO-2007-4A, MO-2007-3C, MO-2007-3B, MO-2007-6B, M0-2007-6A, DUP20110707A
L89356	NP-2, CW-10, CW-6, CW-9, GV-1, GV-2, DUP20110718A
L90249	MO-2009-1

2. LABORATORY QUALITY CONTROL

As specified in the QAPP, laboratory QC was maintained for all analysis through proper licensure, the use of approved analytical methods, QC measurements, appropriate turnaround time for analysis (timeliness), method detection limits (MDLs), and practical quantitation limits (PQLs). Each of these controls is discussed in the following subsections.

The review of laboratory QC included a review to identify any qualified data and an assessment to determine their significance. Additionally, the laboratory QC summaries were reviewed to verify that results met QA criteria.

2.1 Licensure

ACZ is licensed with the Arizona Department of Health Services (license number AZ0102) and is accredited in accordance with the National Environmental Laboratory Accreditation Conference.

2.2 Analytical Methods

The following methods were used for sulfate analysis during this monitoring period:

- U.S. Environmental Protection Agency (EPA) 300.0 (Ion-Chromatography)
- EPA 375.4 (Turbidimetric)
- Standard Method 4500 (Gravimetric)

2.3 Method Detection Limits (MDLs) and Practical Quantification Limits (PQLs)

The MDLs and PQLs of the analytical methods used by ACZ are shown in the following table. The MDLs for analyses of samples were equal to or less than the target MDLs identified in the QAPP.

Method	MDL (mg/L)	PQL (mg/L)	Target MDL[1] (mg/L)
EPA 300.0	0.5	3	10
EPA 375.4	1	5	10
D516-02	5	30	10
SM4500	10	50	10

mg/L = milligrams per liter
[1] Target MDL from Table E.2 of QAPP

2.4 Timeliness

Holding time was derived from the EPA methods utilized and were calculated beginning from the time of sample collection. All samples submitted for sulfate analysis were analyzed within the twenty-eight day holding time specified by each of the methods used for analysis.

2.5 Quality Control Measurements

The following QC samples were prepared and analyzed:

- Preparation blanks, calibration blanks, and calibration verification standards
- Analytical spikes and analytical spike duplicates
- Laboratory control samples
- Laboratory duplicate samples

2.5.1 Preparation Blanks, Calibration Blanks, and Calibration Verification Standards

Preparation blanks were run with each group of samples submitted for sulfate analyses. Preparation blanks were prepared from analyte-free water and treated as routine samples. Analytical results of the preparation blanks showed that no target analytes were detected at the indicated MDL.

Initial calibration blanks and initial calibration verification standards were analyzed prior to each group of samples. The results of each initial calibration blank analyzed showed no detections of the target analyte. Analytical results for the initial calibration verification standards and

laboratory fortified blanks showed percent recoveries that were within the acceptance criteria specified by the ACZ QA plan and the QAPP.

2.5.2 Analytical Spikes and Analytical Spike Duplicates

Analytical spike and spike duplicate samples were analyzed for 10 percent of the samples that were analyzed. The spike samples were prepared by adding a sulfate spike to one randomly chosen sample out of every ten samples analyzed. Spike recoveries for all analyses were between 90 and 110 percent. Instances in which analytical spike recoveries were high, low or unusable are qualified with an "M1", "M2" or "M3" flag, respectively. There were no cases where an "M1" or "M2" flag was used in the second and third quarters of 2011. In each case where an "M3" qualifier was used, the method control sample recovery was checked to insure that it is acceptable. The method control samples were prepared by adding a sulfate spike to de-ionized water.

2.5.3 Laboratory Control Samples

Laboratory control samples were run for each group of samples submitted for sulfate analysis following the gravimetric method of analysis. Recoveries for all laboratory control samples were within the acceptance criteria specified by ACZ.

2.5.4 Laboratory Duplicate Samples

Analyses of laboratory duplicate samples were also reviewed as part of this quality data verification report. Field duplicate samples are discussed in Section 3.1. The relative percent difference (RPDs) for most laboratory duplicate samples were within 20 percent, which is the tolerance range set by the laboratory. The RPD is not used for data validation if the sample concentration is less than ten times the method detection limit. In cases where the RPD was used for data validation based on laboratory standard operating procedure, the results met QA criteria and demonstrated appropriate levels of precision for laboratory analysis of these samples.

3. DATA QUALITY INDICATORS

The QAPP provides several DQIs for assessing the overall quality of the data. These DQIs include the following:

- Precision
- Bias
- Accuracy
- Representativeness
- Comparability
- Completeness
- Sensitivity

Each of these DQIs is discussed below in relation to groundwater sampling and analysis conducted by Sierrita.

3.1 Precision

Precision indicates how well a measurement can be reproduced. Precision is quantified by calculating the RPD between duplicate samples. For the purposes of QA/QC, precision was quantified by calculating the RPDs between duplicates among the following groups of duplicate samples:

- Laboratory duplicate samples
- Field duplicate samples

As discussed in Sections 2.5.2 and 2.5.4, there were no exceedances of RPD QA criteria based on laboratory standard operating procedures for any laboratory duplicates. During this monitoring period, a total of 11 field duplicate samples were collected by Sierrita for filtered sulfate analysis (DUP20110420A, DUP20110427A, DUP20110427B, DUP20110503B, DUP20110511A, DUP20110511B, DUP20110517A, DUP20110518A, DUP20110523A, DUP20110707A, AND DUP20110718A). The collection of 11 field duplicate samples exceeds the QA/QC goal of collecting one duplicate sample for every ten groundwater samples collected, as stated in Section 6 of Sierrita's quality assurance quality control plan, and exceeds the goal of

collecting one duplicate sample for every twenty groundwater samples as stated in the Work Plan (HGC, 2006)

Results of the field duplicate samples collected are provided in the table below. The range of RPD values was between 0.00 and 11.76 percent, all within the 20 percent acceptance criteria for field duplicates, as stated in Section 3.3.1 of the QAPP. Overall, the DQI for precision is met.

ACZ Project No.	Well ID	Duplicate ID	Sample (mg/l)	Duplicate (mg/l)	RPD
L87564	MH-29	DUP20110420A	1790	1770	**1.12%**
L87663	MO-2007-2	DUP20110427A	507	503	**0.79%**
L87662	MH-26A	DUP20110427B	8	9	**11.76%**
L87757	ESP-2	DUP20110503B	28.1	28.1	**0.00%**
L87890	IW-2A	DUP20110511A	87	88	**1.14%**
L87890	IW-15	DUP20110511B	1800	1800	**0.00%**
L88054	MH-30	DUP20110517A	1760	1750	**0.57%**
L88054	PZ-7	DUP20110518A	472	470	**0.42%**
L88205	MH-13B	DUP20110523A	1090	1110	**1.82%**
L89096	MO-2007-6A	DUP20110707A	36.6	37.1	**1.36%**
L89356	NP-2	DUP20110718A	43.5	44.8	**2.94%**

mg/L = milligrams per liter
RPD = Relative Percent Difference

3.2 Bias

Bias is a systematic distortion of measurements causing consistent errors in one direction. Bias is managed in this data set by the consistent application of standardized sample collection and analysis procedures.

3.3 Accuracy

Accuracy is a measure of the agreement of a measurement to a known value and is measured using the recoveries from laboratory control samples. As discussed in Sections 2.5.1, 2.5.2, and 2.5.3 respectively, there were no significant exceedances of the recovery QA criteria for any of the calibration standards, analytical spikes, or laboratory control standards. Based on this

information, the overall accuracy of the data is judged sufficient for the purpose of aquifer characterization.

3.4 Representativeness

All samples were taken from locations specified in the Pre-implementation Monitoring Plan (Sierrita, 2009) using sampling procedures specified in the QAPP. Therefore, the samples are judged to provide a good representation of groundwater quality at the locations. The analytical data are judged to be representative of groundwater conditions because the analyses used standard procedures and methods that met QA/QC guidelines of the QAPP.

3.5 Comparability

All samples were collected using standardized procedures (PDSI, 2005) and were analyzed by ACZ using standardized methods. Insofar as standardized sample collection and analytical methods are adhered to, the sample results should be comparable.

3.6 Completeness

All samples collected by Sierrita were subsequently analyzed and reported by ACZ. All samples analyzed by ACZ are judged to satisfy the QA/QC criteria for this project and are deemed usable for aquifer characterization. Thus, the completeness of analytical results is 100 percent.

3.7 Sensitivity

The analytical methods used to analyze the samples meet the MDL requirements specified in Table E.2 of the QAPP. Therefore, the analytical sensitivity is considered acceptable for use in aquifer characterization.

4. REFERENCES

Hydro Geo Chem, Inc. 2006. Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Phelps Dodge Sierrita Tailing Impoundment, Pima County, Arizona. August 11, 2006, revised October 31, 2006.

Phelps Dodge Sierrita, Inc. 2005. Quality Assurance/Quality Control Plan for Water Monitoring, Phelps Dodge Sierrita, Inc. June 2005.

Sierrita. 2009. Letter from Ned Hall (Sierrita) to Cynthia Campbell (ADEQ) Regarding Mitigation Order on Consent, Docket P-50-06, Response to ADEQ Comments on Recommended Groundwater Monitoring for Sulfate. May 15, 2009.

APPENDIX B

ANALYTICAL DATA REPORTS

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

Korky Vault
FMI Gold & Copper - Sierrita
P.O. Box 527
6200 West Duval Mine Road
Green Valley, AZ 85622-0527

July 12, 2011

Cc: Ben Daigneau

Project ID: XS03X3
ACZ Project ID: L88607– **SULFATE ONLY**

Korky Vault:

Enclosed are analytical reports for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on June 17, 2011. This project was assigned to ACZ's project number, **L88607**. Please reference this number in all future inquiries.

At the request of Phelps Dodge Sierrita, Inc. (PDSI), this laboratory report has been prepared to contain only information specific to samples and analytes identified by PDSI as evaluated pursuant to Mitigation Order No. P-500-06 with Arizona Department of Environmental Quality. Samples and analytes unrelated to the Mitigation Order, but which may be identified on the chain of custody and sample receipt, have been reported to PDSI in a separate report.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under **L88607**. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute. Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all the requirements of NELAC.

This report should be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

ACZ disposes of samples and sub-samples thirty days after the analytical results are reported to the client. That time frame has elapsed for this project. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years. Please notify your Project Manager if you have other needs. If you have any questions, please contact your Project Manager or Customer Service Representative.

S. Habermehl

Scott Habermehl has reviewed
and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS03X3
Sample ID: MH-25B

ACZ Sample ID: ***L88607-01***
Date Sampled: *06/15/11 10:20*
Date Received: *06/17/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	1700			mg/L	30	100	07/07/11 14:05	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS03X3
Sample ID: MH-25C

ACZ Sample ID: ***L88607-02***
Date Sampled: *06/15/11 10:56*
Date Received: *06/17/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	D516-02 - Turbidimetric	1290		*	mg/L	40	200	06/28/11 16:11	mpb

Arizona license number: AZ0102

FMI Gold & Copper - Sierrita
Project ID: ZS03X3
Sample ID: MO-2009-1

ACZ Sample ID: ***L88607-03***
Date Sampled: *06/16/11 11:31*
Date Received: *06/17/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	102		*	mg/L	3	10	07/07/11 16:33	ccp

Arizona license number: AZ0102

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.

(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.

(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.

(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.

(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995 & 20th edition (1998).

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.

(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.

(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click: http://www.acz.com/public/extquallist.pdf

FMI Gold & Copper - Sierrita ACZ Project ID: ***L88607***

Project ID: ZS03X3

Antimony, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304452													
WG304452ICV	ICV	06/28/11 21:21	MS110414-1	.02		.02023	mg/L	101.2	90	110			
WG304452ICB	ICB	06/28/11 21:25				U	mg/L		-0.00088	0.00088			
WG304452LFB	LFB	06/28/11 21:28	MS110523-2	.01		.01087	mg/L	108.7	85	115			
L88502-06AS	AS	06/28/11 21:35	MS110523-2	.05	U	.0529	mg/L	105.8	70	130			
L88502-06ASD	ASD	06/28/11 21:38	MS110523-2	.05	U	.0532	mg/L	106.4	70	130	0.57	20	

Arsenic, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304452													
WG304452ICV	ICV	06/28/11 21:21	MS110414-1	.05		.05328	mg/L	106.6	90	110			
WG304452ICB	ICB	06/28/11 21:25				U	mg/L		-0.0011	0.0011			
WG304452LFB	LFB	06/28/11 21:28	MS110523-2	.05005		.05598	mg/L	111.8	85	115			
L88502-06AS	AS	06/28/11 21:35	MS110523-2	.25025	U	.2689	mg/L	107.5	70	130			
L88502-06ASD	ASD	06/28/11 21:38	MS110523-2	.25025	U	.266	mg/L	106.3	70	130	1.08	20	

Beryllium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304452													
WG304452ICV	ICV	06/28/11 21:21	MS110414-1	.05		.04607	mg/L	92.1	90	110			
WG304452ICB	ICB	06/28/11 21:25				U	mg/L		-0.00022	0.00022			
WG304452LFB	LFB	06/28/11 21:28	MS110523-2	.05005		.04694	mg/L	93.8	85	115			
L88502-06AS	AS	06/28/11 21:35	MS110523-2	.25025	U	.2362	mg/L	94.4	70	130			
L88502-06ASD	ASD	06/28/11 21:38	MS110523-2	.25025	U	.23455	mg/L	93.7	70	130	0.7	20	

Cadmium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304452													
WG304452ICV	ICV	06/28/11 21:21	MS110414-1	.05		.05001	mg/L	100	90	110			
WG304452ICB	ICB	06/28/11 21:25				U	mg/L		-0.00022	0.00022			
WG304452LFB	LFB	06/28/11 21:28	MS110523-2	.0501		.05107	mg/L	101.9	85	115			
L88502-06AS	AS	06/28/11 21:35	MS110523-2	.2505	U	.2536	mg/L	101.2	70	130			
L88502-06ASD	ASD	06/28/11 21:38	MS110523-2	.2505	U	.24935	mg/L	99.5	70	130	1.69	20	

Chromium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG303837													
WG303837ICV	ICV	06/21/11 19:46	II110104-1	2		2.037	mg/L	101.9	95	105			
WG303837ICB	ICB	06/21/11 19:50				U	mg/L		-0.03	0.03			
WG303837LFB	LFB	06/21/11 20:02	II110617-2	.5		.517	mg/L	103.4	85	115			
L88603-15AS	AS	06/21/11 20:14	II110617-2	.5	U	.526	mg/L	105.2	85	115			
L88603-15ASD	ASD	06/21/11 20:17	II110617-2	.5	U	.519	mg/L	103.8	85	115	1.34	20	

FMI Gold & Copper - Sierrita ACZ Project ID: ***L88607***

Project ID: ZS03X3

Cobalt, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG303837													
WG303837ICV	ICV	06/21/11 19:46	II110104-1	2		1.946	mg/L	97.3	95	105			
WG303837ICB	ICB	06/21/11 19:50				U	mg/L		-0.03	0.03			
WG303837LFB	LFB	06/21/11 20:02	II110617-2	.5		.496	mg/L	99.2	85	115			
L88603-15AS	AS	06/21/11 20:14	II110617-2	.5	U	.496	mg/L	99.2	85	115			
L88603-15ASD	ASD	06/21/11 20:17	II110617-2	.5	U	.498	mg/L	99.6	85	115	0.4	20	

Copper, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG303837													
WG303837ICV	ICV	06/21/11 19:46	II110104-1	2		1.943	mg/L	97.2	95	105			
WG303837ICB	ICB	06/21/11 19:50				U	mg/L		-0.03	0.03			
WG303837LFB	LFB	06/21/11 20:02	II110617-2	.5		.502	mg/L	100.4	85	115			
L88603-15AS	AS	06/21/11 20:14	II110617-2	.5	U	.503	mg/L	100.6	85	115			
L88603-15ASD	ASD	06/21/11 20:17	II110617-2	.5	U	.502	mg/L	100.4	85	115	0.2	20	

Fluoride SM4500F-C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG303954													
WG303954ICV	ICV	06/22/11 14:27	WC110614-1	2		1.95	mg/L	97.5	95	105			
WG303954ICB	ICB	06/22/11 14:35				U	mg/L		-0.3	0.3			
WG303954LFB1	LFB	06/22/11 14:42	WC110414-4	5		4.63	mg/L	92.6	90	110			
L88600-07AS	AS	06/22/11 15:38	WC110414-4	20	53.1	74.19	mg/L	105.5	90	110			
L88600-07DUP	DUP	06/22/11 15:42			53.1	51.6	mg/L				2.9	20	
WG303954LFB2	LFB	06/22/11 16:33	WC110414-4	5		4.56	mg/L	91.2	90	110			

Lead, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304452													
WG304452ICV	ICV	06/28/11 21:21	MS110414-1	.05		.05219	mg/L	104.4	90	110			
WG304452ICB	ICB	06/28/11 21:25				U	mg/L		-0.00022	0.00022			
WG304452LFB	LFB	06/28/11 21:28	MS110523-2	.05005		.05514	mg/L	110.2	85	115			
L88502-06AS	AS	06/28/11 21:35	MS110523-2	.25025	.0111	.2651	mg/L	101.5	70	130			
L88502-06ASD	ASD	06/28/11 21:38	MS110523-2	.25025	.0111	.2603	mg/L	99.6	70	130	1.83	20	

Magnesium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG303837													
WG303837ICV	ICV	06/21/11 19:46	II110104-1	100		103.89	mg/L	103.9	95	105			
WG303837ICB	ICB	06/21/11 19:50				U	mg/L		-0.6	0.6			
WG303837LFB	LFB	06/21/11 20:02	II110617-2	50.00321		52.19	mg/L	104.4	85	115			
L88603-15AS	AS	06/21/11 20:14	II110617-2	50.00321	4.5	57.41	mg/L	105.8	85	115			
L88603-15ASD	ASD	06/21/11 20:17	II110617-2	50.00321	4.5	57.57	mg/L	106.1	85	115	0.28	20	

FMI Gold & Copper - Sierrita ACZ Project ID: ***L88607***

Project ID: ZS03X3

Molybdenum, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG303837													
WG303837ICV	ICV	06/21/11 19:46	II110104-1	2		2.026	mg/L	101.3	95	105			
WG303837ICB	ICB	06/21/11 19:50				U	mg/L		-0.03	0.03			
WG303837LFB	LFB	06/21/11 20:02	II110617-2	.5		.504	mg/L	100.8	85	115			
L88603-15AS	AS	06/21/11 20:14	II110617-2	.5	U	.503	mg/L	100.6	85	115			
L88603-15ASD	ASD	06/21/11 20:17	II110617-2	.5	U	.509	mg/L	101.8	85	115	1.19	20	

Nickel, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG303837													
WG303837ICV	ICV	06/21/11 19:46	II110104-1	2.002		1.988	mg/L	99.3	95	105			
WG303837ICB	ICB	06/21/11 19:50				U	mg/L		-0.03	0.03			
WG303837LFB	LFB	06/21/11 20:02	II110617-2	.5		.502	mg/L	100.4	85	115			
L88603-15AS	AS	06/21/11 20:14	II110617-2	.5	U	.507	mg/L	101.4	85	115			
L88603-15ASD	ASD	06/21/11 20:17	II110617-2	.5	U	.497	mg/L	99.4	85	115	1.99	20	

Nitrate/Nitrite as N M353.2 - H2SO4 preserved

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304219													
WG304219ICV	ICV	06/25/11 13:41	WI110330-1	2.416		2.295	mg/L	95	90	110			
WG304219ICB	ICB	06/25/11 13:42				U	mg/L		-0.06	0.06			
WG304224													
WG304224LFB1	LFB	06/25/11 15:01	WI110322-5	2		1.936	mg/L	96.8	90	110			
WG304224LFB2	LFB	06/25/11 15:36	WI110322-5	2		1.926	mg/L	96.3	90	110			
L88595-04AS	AS	06/25/11 15:38	WI110322-5	2	.13	2.101	mg/L	98.6	90	110			
L88607-02DUP	DUP	06/25/11 15:40			1.52	1.527	mg/L				0.5	20	

Residue, Filterable (TDS) @180C SM2540C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG303783													
WG303783PBW	PBW	06/20/11 18:10				U	mg/L		-20	20			
WG303783LCSW	LCSW	06/20/11 18:11	PCN37130	260		264	mg/L	101.5	80	120			
L88607-02DUP	DUP	06/20/11 18:33			2380	2360	mg/L				0.8	20	

Selenium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304511													
WG304511ICV	ICV	06/29/11 11:12	MS110414-1	.05		.05373	mg/L	107.5	90	110			
WG304511ICB	ICB	06/29/11 11:13				U	mg/L		-0.00022	0.00022			
WG304511LFB	LFB	06/29/11 11:15	MS110523-2	.05005		.05264	mg/L	105.2	85	115			
L88685-03AS	AS	06/29/11 11:39	MS110523-2	.05005	.0002	.0602	mg/L	119.9	70	130			
L88685-03ASD	ASD	06/29/11 11:40	MS110523-2	.05005	.0002	.05755	mg/L	114.6	70	130	4.5	20	

FMI Gold & Copper - Sierrita ACZ Project ID: ***L88607***

Project ID: ZS03X3

Sulfate D516-02 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304445													
WG304445ICB	ICB	06/28/11 11:47				U	mg/L		-3	3			
WG304445ICV	ICV	06/28/11 11:47	WI110627-2	20		20.3	mg/L	101.5	90	110			
WG304445LFB	LFB	06/28/11 15:35	WI110322-2	9.99		9.5	mg/L	95.1	90	110			
L88602-10DUP	DUP	06/28/11 15:35			39	35.4	mg/L				9.7	20	
L88602-11AS	AS	06/28/11 15:35	WI110322-2	9.99	14	23.8	mg/L	98.1	90	110			

Sulfate M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304800													
WG304800ICV	ICV	07/05/11 14:43	WI110518-1	49.95		50.5	mg/L	101.1	90	110			
WG304800ICB	ICB	07/05/11 15:04				U	mg/L		-1.5	1.5			
WG304611													
WG304611LFB	LFB	07/06/11 12:57	WI110218-1	30		30.36	mg/L	101.2	90	110			
L88600-05AS	AS	07/06/11 19:17	WI110218-1	1500	U	1507	mg/L	100.5	90	110			
L88600-03DUP	DUP	07/07/11 13:44			43	42.95	mg/L				0.1	20	
WG304659													
WG304659LFB	LFB	07/07/11 0:34	WI110218-1	30		30.48	mg/L	101.6	90	110			
L88600-02DUP	DUP	07/07/11 1:16			U	U	mg/L				0	20	RA
L88607-03AS	AS	07/07/11 16:54	WI110218-1	150	102	256.4	mg/L	102.9	90	110			

Thallium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304452													
WG304452ICV	ICV	06/28/11 21:21	MS110414-1	.05		.05449	mg/L	109	90	110			
WG304452ICB	ICB	06/28/11 21:25				U	mg/L		-0.00022	0.00022			
WG304452LFB	LFB	06/28/11 21:28	MS110523-2	.0501		.05283	mg/L	105.4	85	115			
L88502-06AS	AS	06/28/11 21:35	MS110523-2	.2505	.0011	.25805	mg/L	102.6	70	130			
L88502-06ASD	ASD	06/28/11 21:38	MS110523-2	.2505	.0011	.2563	mg/L	101.9	70	130	0.68	20	

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

FMI Gold & Copper - Sierrita ACZ Project ID: ***L88607***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L88607-03	WG304659	Sulfate	M300.0 - Ion Chromatography	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Certification Qualifiers

FMI Gold & Copper - Sierrita ACZ Project ID: ***L88607***

Wet Chemistry

The following parameters are not offered for certification or are not covered by AZ certificate #AZ0102.

Sulfate	D516-02 - Turbidimetric

ACZ Laboratories, Inc.
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Sample Receipt

FMI Gold & Copper - Sierrita
ZS03X3

ACZ Project ID: L88607
Date Received: 06/17/2011 09:59
Received By: gac
Date Printed: 6/19/2011

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?			X
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id		Temp (°C)	Rad (µR/hr)
2291		0.3	15

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

FMI Gold & Copper - Sierrita
ZS03X3

ACZ Project ID: L88607
Date Received: 06/17/2011 09:59
Received By: gac
Date Printed: 6/19/2011

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L88607-01	MH-25B											
L88607-02	MH-25C		Y		Y							
L88607-03	MO-2009-1											

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: gac

L88607

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

L88607-1

CHAIN of CUSTODY

Report to:

Name: K.R. (Korky) Vault
Company: Freeport-McMoRan Sierrita Inc.
E-mail: koretta_vault@fmi.com
Address: 6200 W. Duval Mine Road
Green Valley, AZ 85614
Telephone: 520-393-4345-8844

Copy of Report to:

Name: Ben Daigneau
Company: Clear Creek Associates
E-mail: bdaigneau@clearcreekassociates.com
Telephone: 520-622-3222

Invoice to:

Name:
Company:
E-mail:
Address:
Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [ ] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for CO DW Compliance Monitoring? YES [ ] NO [x]
If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

Quote #:
Project/PO #: ZS03X3
Reporting state for compliance testing:
Sampler's Name: Alexis Alvarez
Are any samples NRC licensable material? Yes No

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	Quarterly	Sulfate						
MH-25B	06/15/2011 : 1020	GW	1		x						
MH-25C	06/15/2011 : 1056	GW	1	x							
MO-2009-1	06/16/2011 : 1131	GW	1		x						

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Copy of report to Ben Daigneau contains only "SO4" results with QC Summary.

UPS Tracking # 1Z 867 7E4 23 1000 8302

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
K.R. Vault	6/16/2011 : 1530	UPS	06/16/2011 : 1530
UPS			
		WS	6/17/11 09:59

FRMAD050.01.15.09 White - Return with sample. Yellow - Retain for your records.

L88607 Chain of Custody

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

August 03, 2011

Report to:
Korky Vault
FMI Gold & Copper - Sierrita
6200 W. Duval Mine Rd.
Green Valley, AZ 85614

Bill to:
Accounts Payable
FMI Gold & Copper - Sierrita
P.O. Box 2671
Phoenix, AZ 85002-2671

cc: Ben Daigneau

Project ID: ZS0000007L
ACZ Project ID: L89356

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on July 21, 2011. This project has been assigned to ACZ's project number, L89356. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L89356. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after September 03, 2011. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl

Scott Habermehl has reviewed
and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: NP-2

ACZ Sample ID: ***L89356-01***
Date Sampled: *07/18/11 12:36*
Date Received: *07/21/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	44.8			mg/L	0.5	3	07/27/11 21:07	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
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Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: CW-10

ACZ Sample ID: ***L89356-02***
Date Sampled: *07/20/11 08:09*
Date Received: *07/21/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	50.7			mg/L	0.5	3	07/27/11 21:28	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
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Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: CW-6

ACZ Sample ID: ***L89356-03***
Date Sampled: *07/20/11 08:59*
Date Received: *07/21/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	81			mg/L	3	10	07/28/11 12:15	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
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Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: CW-9

ACZ Sample ID: ***L89356-04***
Date Sampled: *07/20/11 09:52*
Date Received: *07/21/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	43.9			mg/L	0.5	3	07/27/11 22:53	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
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Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: GV-1

ACZ Sample ID: ***L89356-05***
Date Sampled: *07/20/11 10:12*
Date Received: *07/21/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	39.6			mg/L	0.5	3	07/27/11 23:14	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: GV-2

ACZ Sample ID: ***L89356-06***
Date Sampled: *07/20/11 10:54*
Date Received: *07/21/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	87.2			mg/L	0.5	3	07/27/11 23:35	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
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Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: DUP20110718A

ACZ Sample ID: ***L89356-07***
Date Sampled: *07/18/11 00:00*
Date Received: *07/21/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	44.6			mg/L	0.5	3	07/28/11 0:38	ccp

Arizona license number: AZ0102

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995 & 20th edition (1998).

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click: http://www.acz.com/public/extquallist.pdf

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L

ACZ Project ID: ***L89356***

Sulfate M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304800													
WG304800ICV	ICV	07/05/11 14:43	WI110518-1	49.95		50.5	mg/L	101.1	90	110			
WG304800ICB	ICB	07/05/11 15:04				U	mg/L		-1.5	1.5			
WG306248													
WG306248LFB1	LFB	07/27/11 16:12	WI110713-2	30		29.74	mg/L	99.1	90	110			
L89202-01DUP	DUP	07/27/11 16:54			4260	4220	mg/L				0.9	20	
L89202-02AS	AS	07/27/11 17:36	WI110713-2	600	680	1257	mg/L	96.2	90	110			
L89356-02DUP	DUP	07/27/11 21:50			50.7	50.46	mg/L				0.5	20	
WG306248LFB2	LFB	07/28/11 2:24	WI110713-2	30		29.54	mg/L	98.5	90	110			
L89356-03AS	AS	07/28/11 12:36	WI110713-2	150	81	228.3	mg/L	98.2	90	110			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

FMI Gold & Copper - Sierrita ACZ Project ID: ***L89356***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION

No extended qualifiers associated with this analysis

Certification Qualifiers

FMI Gold & Copper - Sierrita ACZ Project ID: ***L89356***

No certification qualifiers associated with this analysis

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

FMI Gold & Copper - Sierrita
ZS0000007L

ACZ Project ID: L89356
Date Received: 07/21/2011 08:53
Received By: ksj
Date Printed: 7/21/2011

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id		Temp (°C)	Rad (µR/hr)
Na13499		2.6	18

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

FMI Gold & Copper - Sierrita
ZS0000007L

ACZ Project ID: L89356
Date Received: 07/21/2011 08:53
Received By: ksj
Date Printed: 7/21/2011

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L89356-01	NP-2									X		
L89356-02	CW-10									X		
L89356-03	CW-6									X		
L89356-04	CW-9									X		
L89356-05	GV-1									X		
L89356-06	GV-2									X		
L89356-07	DUP20110718A									X		

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: ksj

ACZ Laboratories, Inc. L89356

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: K.R. (Korky) Vault	Address: 6200 W. Duval Mine Road
Company: Freeport-McMoRan Sierrita Inc.	Green Valley, AZ 85614
E-mail: koretta_vault@fmi.com	Telephone: 520-393-4345

Copy of Report to:

Name: Ben Daigneau	E-mail: bdaigneau@clearcreekassociates.com
Company: Clear Creek Associates	Telephone: 520-622-3222

Invoice to:

Name:	Address:
Company:	
E-mail:	Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [ ] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for CO DW Compliance Monitoring? YES [ ] NO [X]
If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

Quote #:
Project/PO #: ZS0000007L
Reporting state for compliance testing:
Sampler's Name: Korky Vault
Are any samples NRC licensable material? Yes No

ANALYSES REQUESTED (attach list or use code number)

SAMPLE IDENTIFICATION	DATE TIME	Matrix	# of Containers	SO4 by EPA 300 or EPA 375							
NP-2	07/18/2011 : 1236	GW	1	X							
CW-10	07/20/2011 : 0809	GW	1	X							
CW-6	07/20/2011 : 0859	GW	1	X							
CW-9	07/20/2011 : 0952	GW	1	X							
GV-1	07/20/2011 : 1012	GW	1	X							
GV-2	07/20/2011 : 1054	GW	1	X							
DUP20110718A	07/18/2011	GW	1	X							

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

UPS Tracking # 1Z 867 7E4 23 1000 8268

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME
K.R. Vault	07/20/2011 : 1400	UPS	07/20/2011 : 1400
UPS			
		005	7/21/11 0830

FRMAD050.01.15.09 White - Return with sample. Yellow - Retain for your records.

L89356 Chain of Custody

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

July 26, 2011

Report to:
Korky Vault
FMI Gold & Copper - Sierrita
6200 W. Duval Mine Rd.
Green Valley, AZ 85614

Bill to:
Accounts Payable
FMI Gold & Copper - Sierrita
P.O. Box 2671
Phoenix, AZ 85002-2671

cc: Ben Daigneau

Project ID: ZS0000007L
ACZ Project ID: L89096

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on July 09, 2011. This project has been assigned to ACZ's project number, L89096. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L89096. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after August 26, 2011. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl

Scott Habermehl has reviewed
and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: MO-2007-4C

ACZ Sample ID: ***L89096-01***
Date Sampled: *07/06/11 09:41*
Date Received: *07/09/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	85			mg/L	3	10	07/24/11 16:56	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
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Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: MO-2007-4B

ACZ Sample ID: ***L89096-02***
Date Sampled: *07/06/11 09:22*
Date Received: *07/09/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	34.4			mg/L	0.5	3	07/22/11 21:52	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: MO-2007-4A

ACZ Sample ID: ***L89096-03***
Date Sampled: *07/06/11 10:25*
Date Received: *07/09/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	35.3			mg/L	0.5	3	07/22/11 22:14	ccp

Arizona license number: AZ0102

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: MO-2007-3C

ACZ Sample ID: ***L89096-04***
Date Sampled: *07/06/11 14:07*
Date Received: *07/09/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	101		*	mg/L	3	10	07/22/11 22:35	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: MO-2007-3B

ACZ Sample ID: ***L89096-05***
Date Sampled: *07/06/11 13:35*
Date Received: *07/09/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	38.3			mg/L	0.5	3	07/22/11 23:38	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: MO-2007-6B

ACZ Sample ID: ***L89096-06***
Date Sampled: *07/07/11 09:41*
Date Received: *07/09/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	57.5			mg/L	0.5	3	07/22/11 23:59	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: MO-2007-6A

ACZ Sample ID: ***L89096-07***
Date Sampled: *07/07/11 10:34*
Date Received: *07/09/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	36.6			mg/L	0.5	3	07/23/11 0:20	ccp

Arizona license number: AZ0102

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L
Sample ID: DUP20110707A

ACZ Sample ID: ***L89096-08***
Date Sampled: *07/07/11 00:00*
Date Received: *07/09/11*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	37.1			mg/L	0.5	3	07/23/11 0:41	ccp

Arizona license number: AZ0102

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	LCSWD	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	LFB	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	LFM	Laboratory Fortified Matrix
CCV	Continuing Calibration Verification standard	LFMD	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	LRB	Laboratory Reagent Blank
ICB	Initial Calibration Blank	MS	Matrix Spike
ICV	Initial Calibration Verification standard	MSD	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	PBS	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	PBW	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	PQV	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	SDL	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.

(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.

(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.

(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.

(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995 & 20th edition (1998).

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.

(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.

(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

(4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click: http://www.acz.com/public/extquallist.pdf

FMI Gold & Copper - Sierrita
Project ID: ZS0000007L

ACZ Project ID: ***L89096***

Sulfate M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG304800													
WG304800ICV	ICV	07/05/11 14:43	WI110518-1	49.95		50.5	mg/L	101.1	90	110			
WG304800ICB	ICB	07/05/11 15:04				U	mg/L		-1.5	1.5			
WG305979													
WG305979LFB	LFB	07/22/11 15:11	WI110713-2	30		29.39	mg/L	98	90	110			
L89077-08DUP	DUP	07/24/11 16:35			16.7	16.7	mg/L				0	20	
L89096-01AS	AS	07/24/11 17:17	WI110713-2	150	85	231	mg/L	97.3	90	110			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

FMI Gold & Copper - Sierrita ACZ Project ID: ***L89096***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L89096-04	WG305979	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.

ACZ Laboratories, Inc.
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Certification Qualifiers

FMI Gold & Copper - Sierrita ACZ Project ID: ***L89096***

No certification qualifiers associated with this analysis

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

FMI Gold & Copper - Sierrita
ZS0000007L

ACZ Project ID: L89096
Date Received: 07/09/2011 11:05
Received By: gac
Date Printed: 7/11/2011

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Is the trip blank for Cyanide present?			X
12) Is the trip blank for VOA present?			X
13) Are samples requiring no headspace, headspace free?			X
14) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
3017	1.5	17

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

FMI Gold & Copper - Sierrita
ZS0000007L

ACZ Project ID: L89096
Date Received: 07/09/2011 11:05
Received By: gac
Date Printed: 7/11/2011

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L89096-01	MO-2007-4C									X		
L89096-02	MO-2007-4B									X		
L89096-03	MO-2007-4A									X		
L89096-04	MO-2007-3C									X		
L89096-05	MO-2007-3B									X		
L89096-06	MO-2007-6B									X		
L89096-07	MO-2007-6A									X		
L89096-08	DUP20110707A									X		

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Hydrochloric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

ACZ Laboratories, Inc.

L89096

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: K.R. (Korky) Vault	Address: 6200 W. Duval Mine Road
Company: Freeport-McMoRan Sierrita Inc.	Green Valley, AZ 85614
E-mail: koretta_vault@fmi.com	Telephone: 520-393-4345

Copy of Report to:

Name: Ben Daigneau	E-mail: bdaigneau@clearcreekassociates.com
Company: Clear Creek Associates	Telephone: 520-622-3222

Invoice to:

Name:	Address:
Company:	
E-mail:	Telephone:

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [ ] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for CO DW Compliance Monitoring? YES [ ] NO [X]
If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

Quote #:
Project/PO #: ZS0000007L
Reporting state for compliance testing:
Sampler's Name: Korky Vault
Are any samples NRC licensable material? Yes No

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	SO4 by EPA 300 or EPA 375							
MO-2007-4C	07/06/2011 : 0941	GW	1	X							
MO-2007-4B	07/06/2011 : 0922	GW	1	X							
MO-2007-4A	07/06/2011 : 1025	GW	1	X							
MO-2007-3C	07/06/2011 : 1407	GW	1	X							
MO-2007-3B	07/06/2011 : 1335	GW	1	X							
MO-2007-6B	07/07/2011 : 0941	GW	1	X							
MO-2007-6A	07/07/2011 : 1034	GW	1	X							
DUP20110707A	07/07/2011	GW	1	X							

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

UPS Tracking # 1Z 867 7E4 23 1000 8286

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
KRVault	07/07/2011 : 1300	UPS	07/07/2011 : 1300
UPS			
		WGS	7/9 1105

FRMAD050.01.15.09 White - Return with sample. Yellow - Retain for your records.

L89096 Chain of Custody

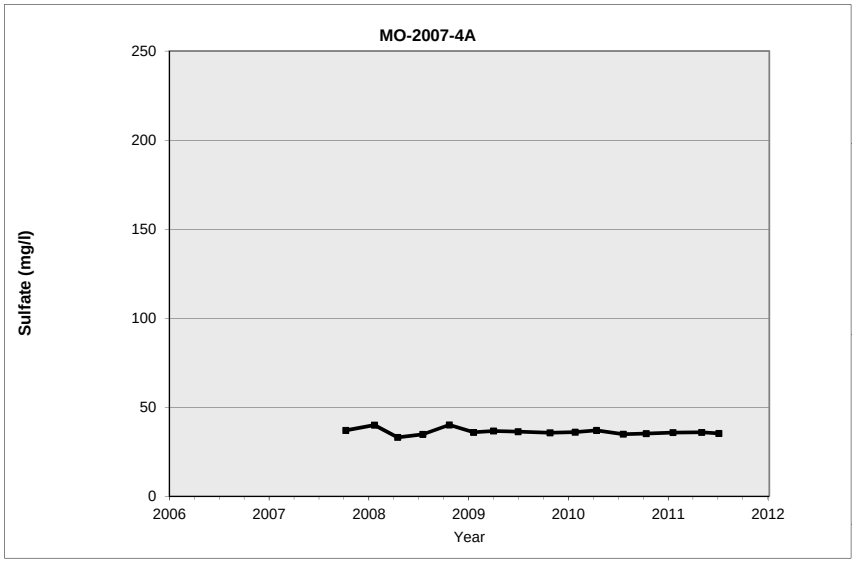
APPENDIX C

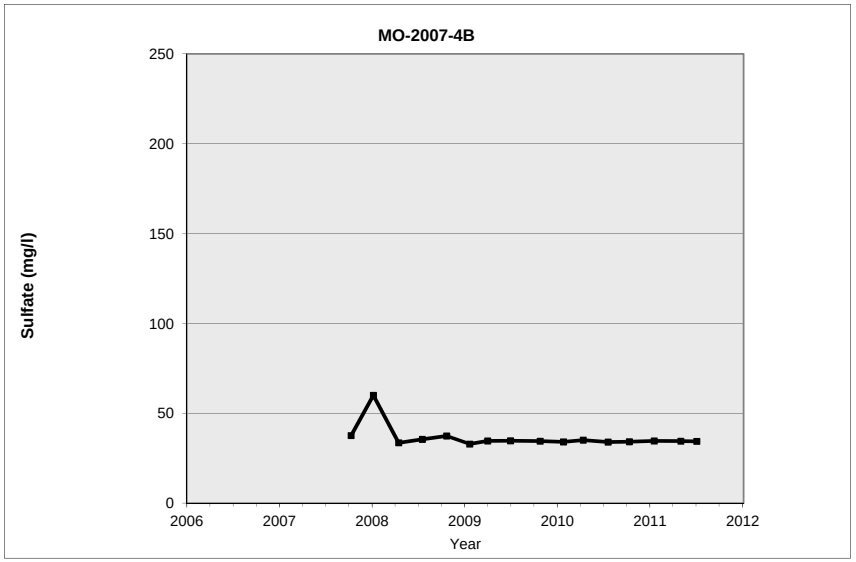
TIME SERIES GRAPHS OF SULFATE CONCENTRATION

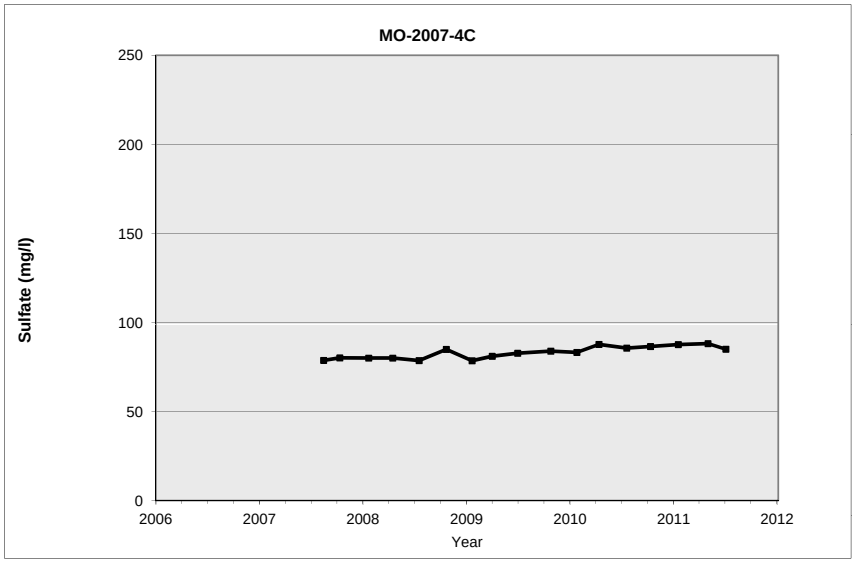
TABLE C.1
Sulfate Concentration Over Time

	Date and dissolved sulfate concentration reported in milligrams per liter (mg/l)																			
Well ID	**Q4 2006**	**Q1 2007**	**Q2 2007**	**Q3 2007**	**Q4 2007**	**Q1 2008**	**Q2 2008**	**Q3 2008**	**Q4 2008**	**Q1 2009**	**Q2 2009**	**Q3 2009**	**Q4 2009**	**Q1 2010**	**Q2 2010**	**Q3 2010**	**Q4 2010**	**Q1 2011**	**Q2 2011**	**Q3 2011**
CW-6	12/04/06 46.2	01/03/07 49.2	05/14/07 68.7	07/10/07 57.6	10/02/07 54.2	01/08/08 48.9	04/15/08 51.2	07/08/08 47.9	10/07/08 51.5	02/06/09 48.2	04/22/09 47.9	09/17/09 70	11/05/09 59.7	02/10/10 46.6	05/14/10 52.1	07/27/10 55.2	10/14/10 52.5	02/24/11 70.3	04/28/11 58.1	07/20/11 81
CW-9	12/04/06 44.5	01/03/07 44.9	05/14/07 47.8	07/10/07 46.7	10/02/07 46.4	01/08/08 47.3	04/15/08 43.7	07/08/08 44.1	10/07/08 43.5	02/06/09 45.1	04/22/09 44.3	07/30/09 43.8	11/05/09 44.7	02/10/10 43.4	05/14/10 44.2	07/27/10 44.1	10/14/10 44.2	02/24/11 42.7	04/28/11 44.4	07/20/11 43.9
CW-10	12/04/06 37.2	01/24/07 48.6	05/14/07 52.8	07/10/07 51.7	10/02/07 47.7	01/08/08 45.3	04/15/08 50.8	07/08/08 50.5	10/07/08 48.3	02/06/09 51.3	04/22/09 47.9	07/30/09 49.2	11/20/09 49.9	02/10/10 44.9	05/14/10 49.1	07/27/10 48.9	10/14/10 48.5	02/24/11 50.2	04/28/11 49.6	07/20/11 50.7
ESP-1	12/04/06 262	01/03/07 242	05/14/07 113	07/10/07 94	10/12/07 110	01/23/08 100	04/18/08 102	07/25/08 104	10/30/08 121	01/29/09 113	04/16/09 130	NS	11/10/09 173	NS	4/28/10 204	NS	10/15/10 291	NS	05/03/11 359	NS
ESP-2	12/04/06 29.6	01/03/07 31.3	05/14/07 28.4	07/10/07 28.6	10/12/07 30	01/23/08 30	04/18/08 27.6	07/25/08 26.8	10/30/08 30.1	01/29/09 27.8	04/16/09 28.2	NS	11/10/09 28.9	NS	4/28/10 28.7	NS	10/15/10 27.9	NS	05/03/11 28.1	NS
ESP-3	12/04/06 36.2	01/03/07 37.5	05/14/07 36.6	07/10/07 36.6	10/12/07 40	01/23/08 30	04/18/08 35.7	07/25/08 34	10/30/08 36.8	01/29/09 35.2	04/16/09 35.3	NS	11/12/09 39.5	NS	4/28/10 35.8	NS	10/15/10 35.2	NS	05/03/11 35.1	NS
GV-01-GVDWID		01/09/07 40.9	04/10/07 43.2	07/11/07 41.5	10/03/07 43.8	01/07/08 45.7	04/16/08 44.1	07/07/08 45.2	11/25/08 39	03/03/09 42.3	04/22/09 40.6	07/29/09 44.3	11/04/09 45.1	01/27/10 47.0	04/01/10 48.5	07/28/10 39.4	10/14/10 38.4	01/20/11 40.0	04/28/11 42.9	07/20/11 39.6
GV-02-GVDWID		01/09/07 103	04/10/07 106	07/11/07 98	10/03/07 100	01/07/08 98	04/16/08 97	07/07/08 93.2	11/25/08 93.5	02/04/09 98.8	04/22/09 79.5	07/29/09 91.6	11/04/09 93.2	01/27/10 94.9	04/01/10 99.5	07/28/10 83	10/14/10 90.7	01/20/11 92.7	04/28/11 87.3	07/20/11 87.2
MO-2007-1A				08/08/07 19.2	10/09/07 20	01/24/08 20	04/09/08 21	07/14/08 16.6	10/17/08 17.9	01/16/09 18.1	04/01/09 18.2	07/01/09 16.3	10/22/09 16.6	NS	04/16/10 18.5	NS	10/13/10 16	NS	05/05/11 17.9	NS
MO-2007-1B				08/02/07 18.9	10/09/07 30	01/24/08 30	04/09/08 35	07/14/08 39.8	10/17/08 54.3	01/16/09 69.7	04/01/09 84.1	07/01/09 99	10/22/09 143	NS	04/16/10 230	NS	10/13/10 340	NS	05/05/11 479	NS
MO-2007-1C				07/31/07 112	10/09/07 90	01/24/08 140	04/09/08 149	07/14/08 165	10/21/08 146	01/16/09 233	04/01/09 229	07/01/09 236	10/22/09 301	NS	04/16/10 320	NS	10/13/10 376	NS	04/20/11 381	NS
MO-2007-3B				09/10/07 38	10/09/07 40	01/21/08 40	04/16/08 37	07/14/08 37.8	10/22/08 42.4	01/19/09 36.9	04/01/09 38.2	07/27/09 37.2	10/22/09 39.1	01/20/10 37.9	04/22/10 41.9	07/21/10 38.7	10/26/10 39.1	01/18/11 38.2	05/04/11 38.1	07/06/11 38.3
MO-2007-3C				07/05/07 136	10/10/07 110	01/21/08 130	04/15/08 127	07/14/08 126	10/21/08 103	01/19/09 113	04/01/09 115	07/22/09 107	10/22/09 108	01/20/10 103	04/14/10 110	07/21/10 101	10/26/10 104	01/18/11 106	05/04/11 107	07/06/11 101
MO-2007-4A					10/09/07 37	01/22/08 40	04/16/08 33.1	07/17/08 34.8	10/22/08 40.1	01/19/09 35.9	04/02/09 36.7	07/01/09 36.3	10/26/09 35.7	01/26/10 36.0	04/14/10 37.0	07/21/10 34.9	10/13/10 35.2	01/19/11 35.8	05/04/11 35.9	07/06/11 35.3
MO-2007-4B					10/11/07 37.6	01/07/08 60	04/16/08 33.6	07/18/08 35.5	10/22/08 37.4	01/21/09 32.9	04/02/09 34.6	07/01/09 34.7	10/26/09 34.5	01/26/10 34.1	04/14/10 35.1	07/21/10 34	10/13/10 34.2	01/19/11 34.6	05/04/11 34.5	07/06/11 34.4
MO-2007-4C				08/16/07 78.7	10/12/07 80.1	01/22/08 80	04/16/08 80	07/18/08 78.6	10/22/08 84.9	01/21/09 78.5	04/02/09 81	07/01/09 82.7	10/26/09 83.9	01/26/10 83.2	04/14/10 87.7	07/21/10 85.6	10/13/10 86.5	01/19/11 87.6	05/04/11 88.1	07/06/11 85
MO-2007-6A					10/02/07 26.5	01/22/08 30	04/18/08 20.5	07/24/08 16.9	10/23/08 18.6	01/22/09 26.9	04/02/09 23.7	07/22/09 19.8	10/26/09 23.5	01/20/10 24.6	04/21/10 34.7	08/10/10 26.8	10/26/10 33.9	01/18/11 30.2	05/05/11 29.2	07/07/11 36.6
MO-2007-6B					10/04/07 93.6	01/22/08 80	04/17/08 90.4	07/24/08 81.5	10/23/08 63.2	01/22/09 84.5	04/02/09 75.7	07/22/09 63.5	10/26/09 62.1	01/20/10 69.7	04/21/10 57.9	08/10/10 68.8	10/26/11 57.7	01/18/11 58.5	05/05/11 57.2	07/07/11 57.5
MO-2009-1											04/24/09 62.1	07/29/09 97.7	11/03/09 109	01/25/10 82.1	04/20/10 99	08/10/10 109	12/15/10 94	02/02/11 92	06/16/11 102	08/31/11 108
NP-2			06/04/07 41.2	08/13/07 41.7	11/06/07 41.7	01/11/08 43.5	04/17/08 40	07/11/08 40.5	10/09/08 39.7	02/09/09 42.4	04/24/09 32.1	09/17/09 40	NS	NS	04/22/10 41.9	08/05/10 41.2	10/25/10 41.4	01/19/11 41.9	05/03/11 43.5	07/18/11 44.8

FIGURE C.1
SULFATE CONCENTRATION OVER TIME FOR WELLS
MO-2007-4A, MO-2007-4B, MO-2007-4C, AND CW-6







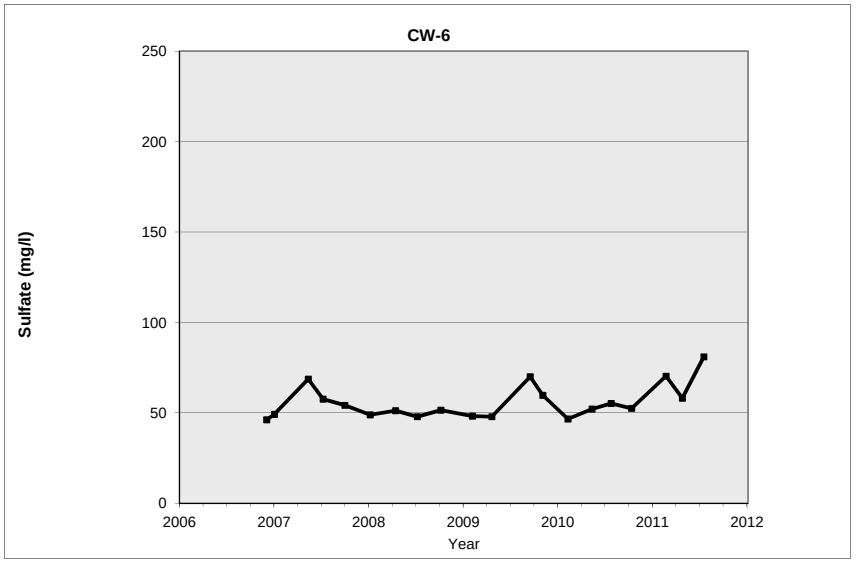
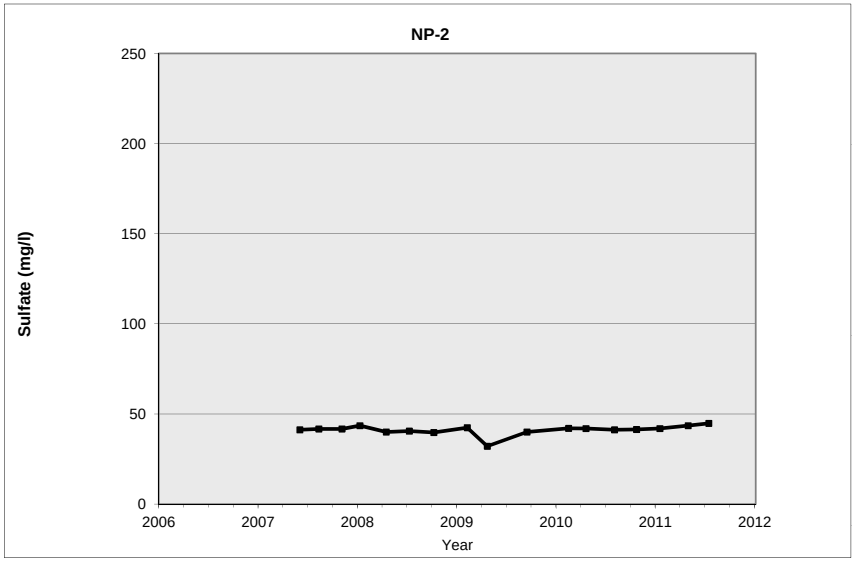
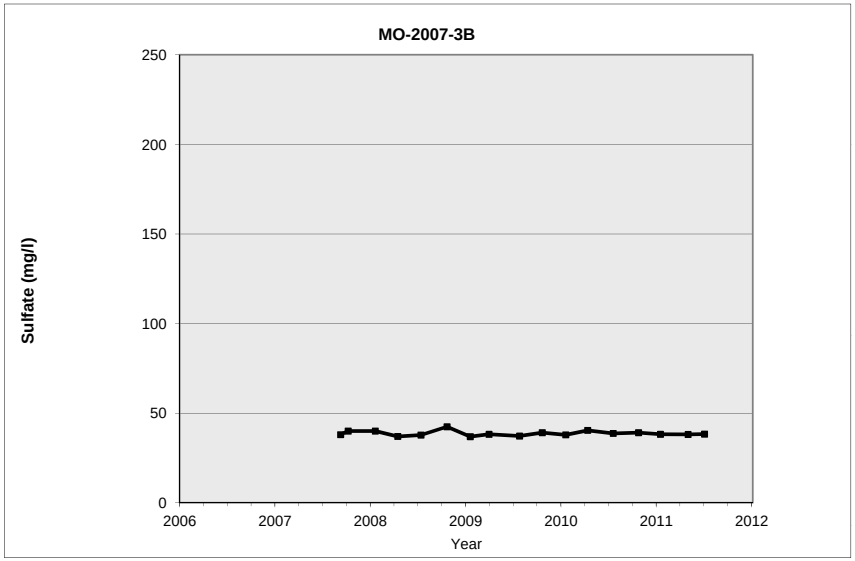
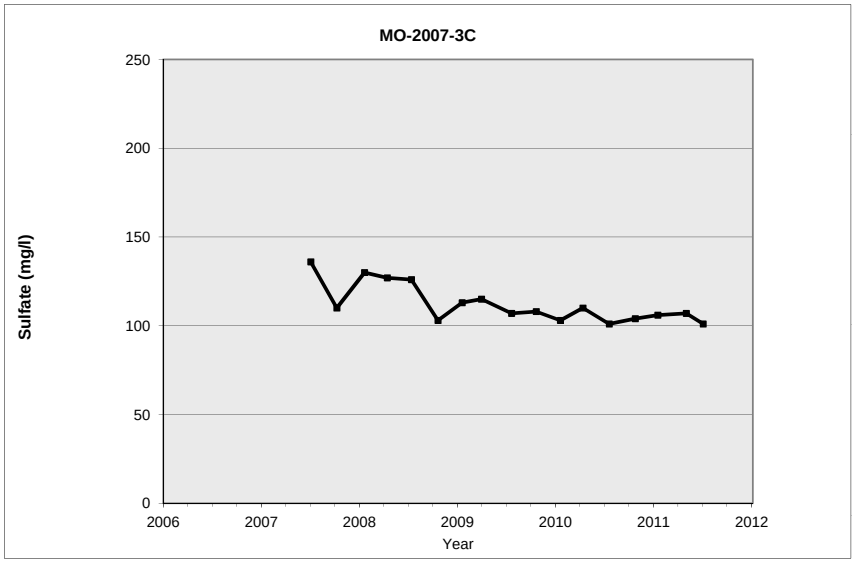


FIGURE C.2
SULFATE CONCENTRATION OVER TIME FOR WELLS
NP-2, MO-2007-3B, MO-2007-3C, AND CW-9







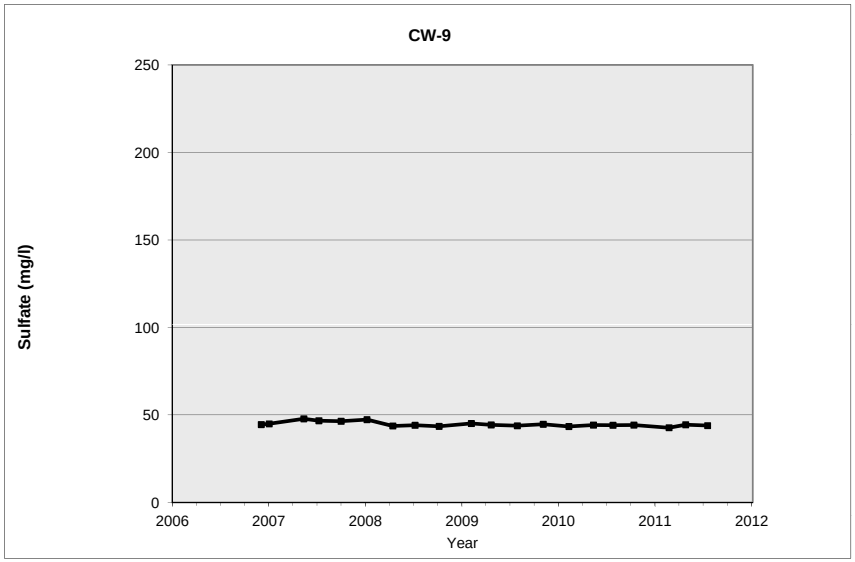
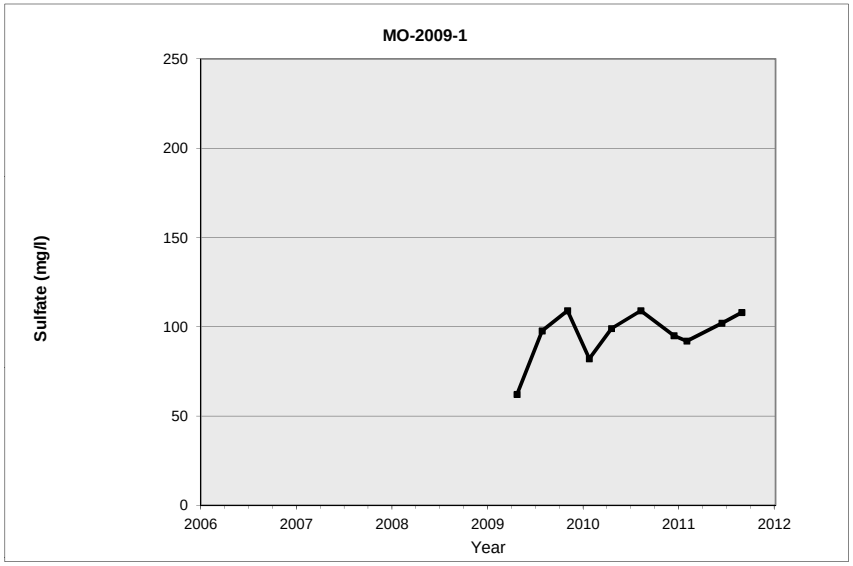


FIGURE C.3
SULFATE CONCENTRATION OVER TIME FOR WELLS MO-2009-1 AND CW-10



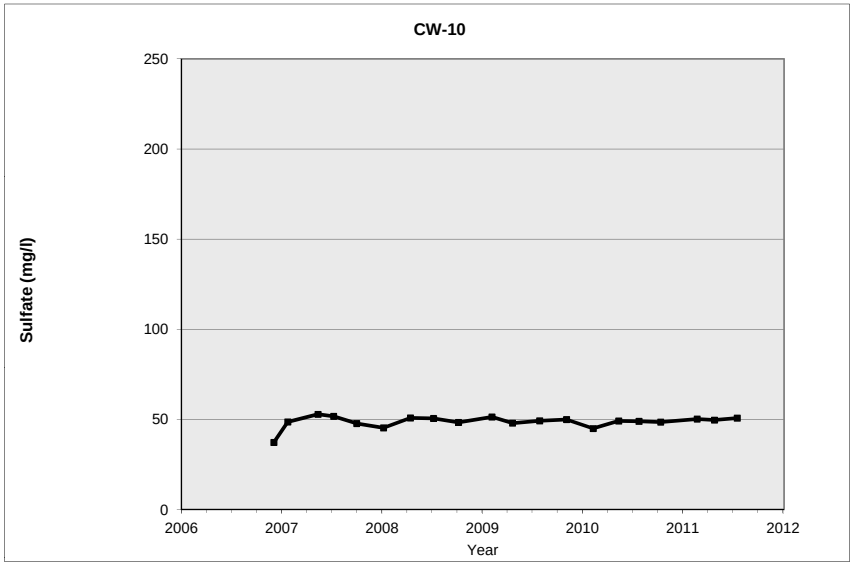
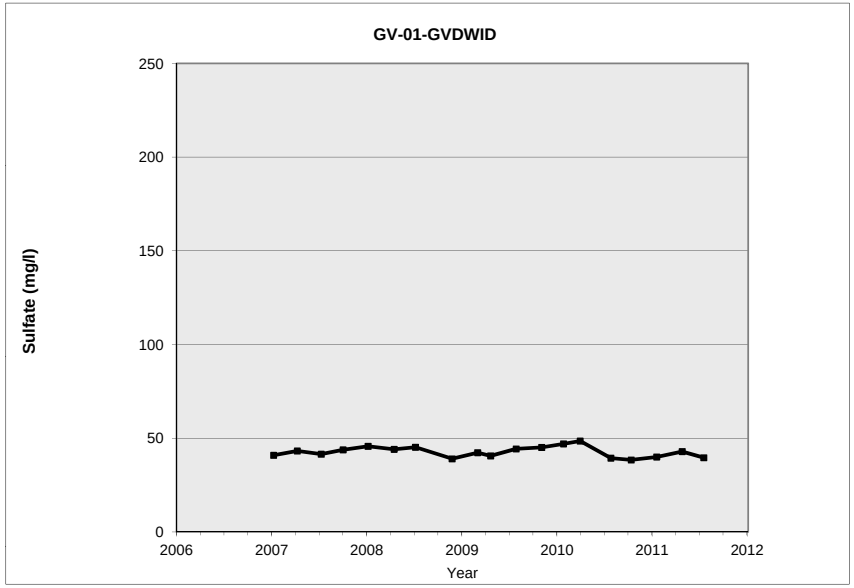
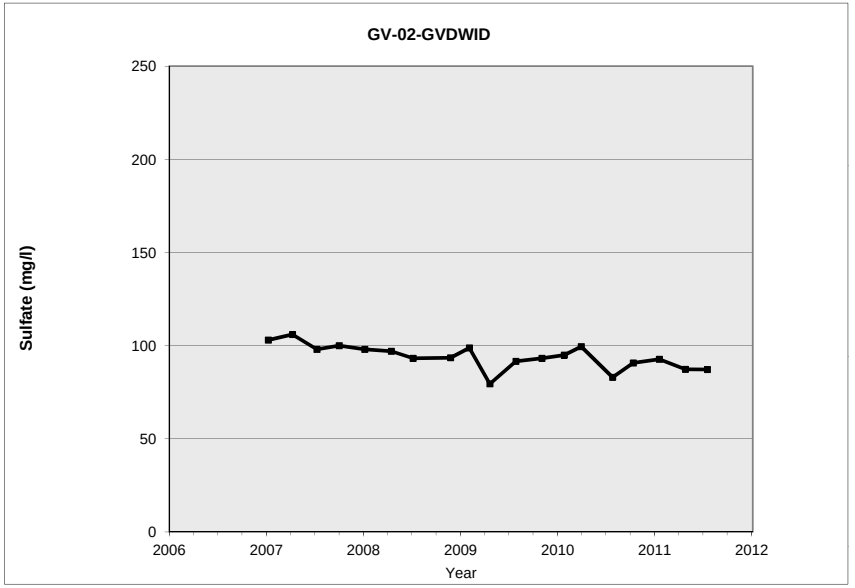
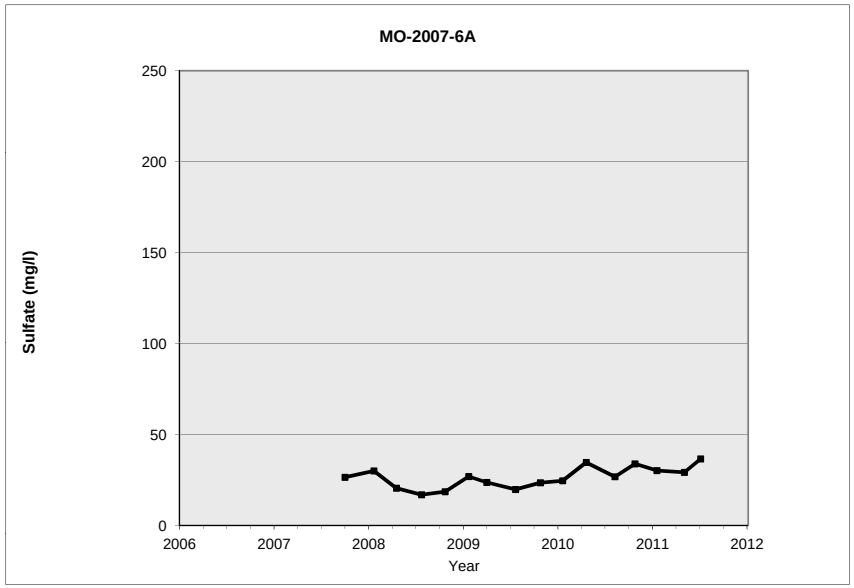


FIGURE C.4
SULFATE CONCENTRATION OVER TIME FOR WELLS
GV-01-GVDWID, GV-02-GVDWID, MO-2007-6A, AND MO-2007-6B







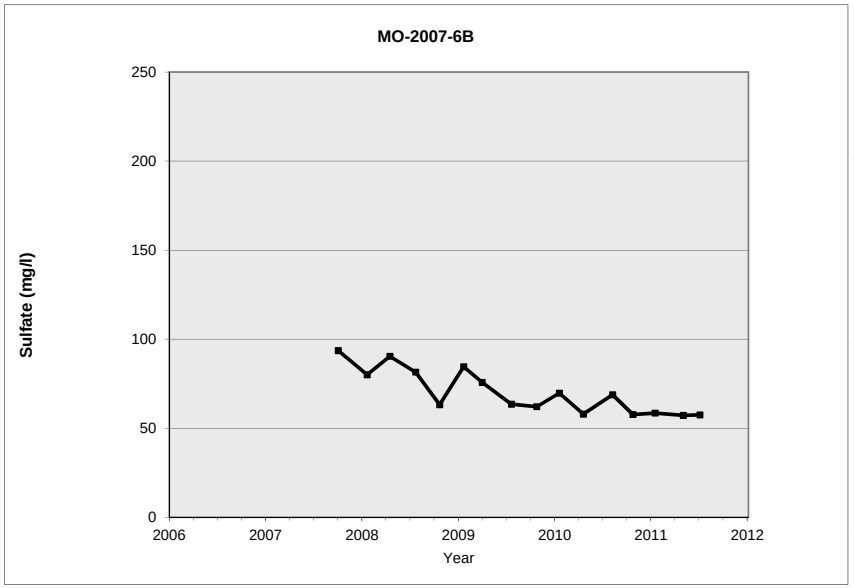
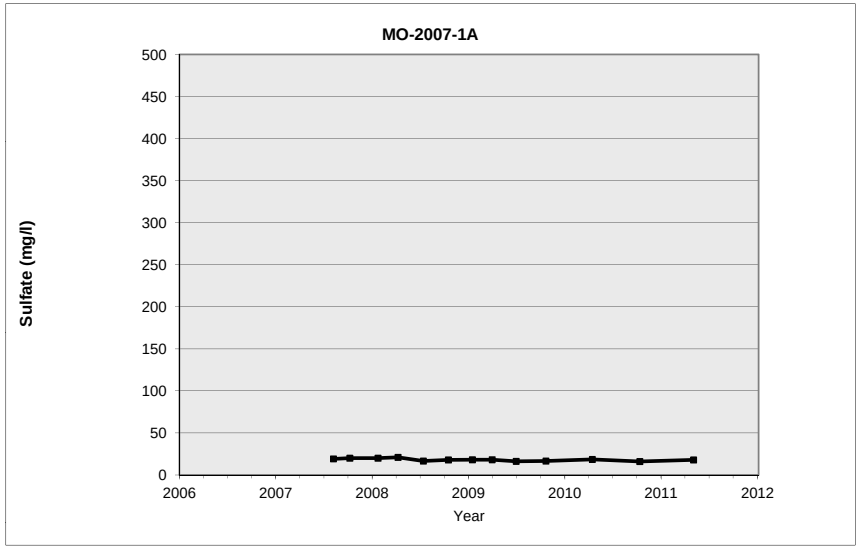
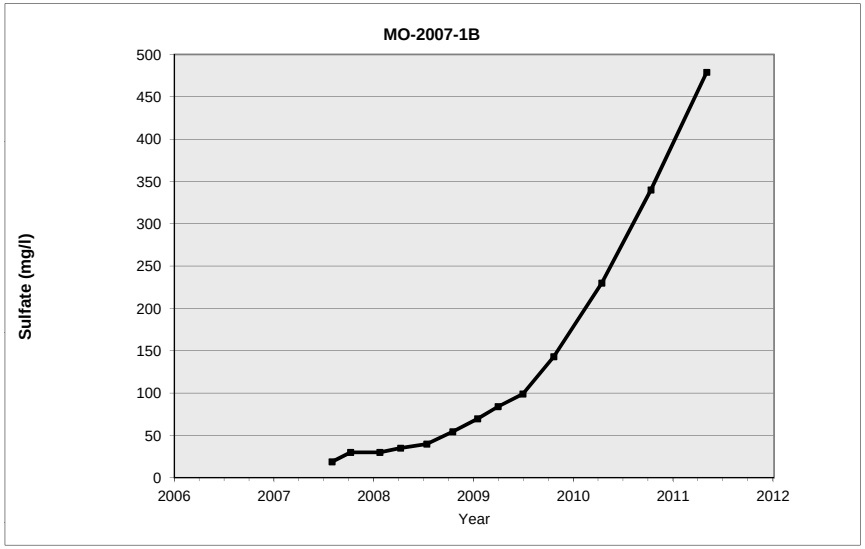


FIGURE C.5
SULFATE CONCENTRATION OVER TIME FOR WELLS
MO-2007-1A, MO-2007-1B, AND MO-2007-1C





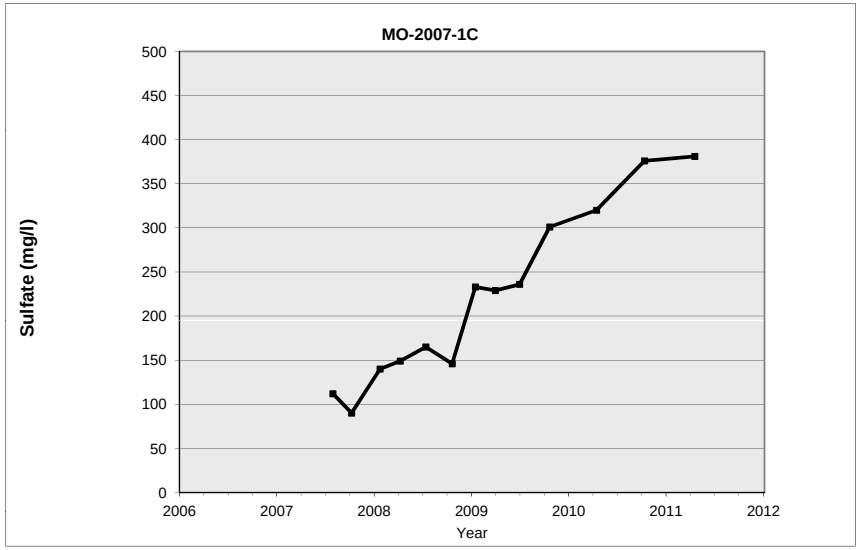
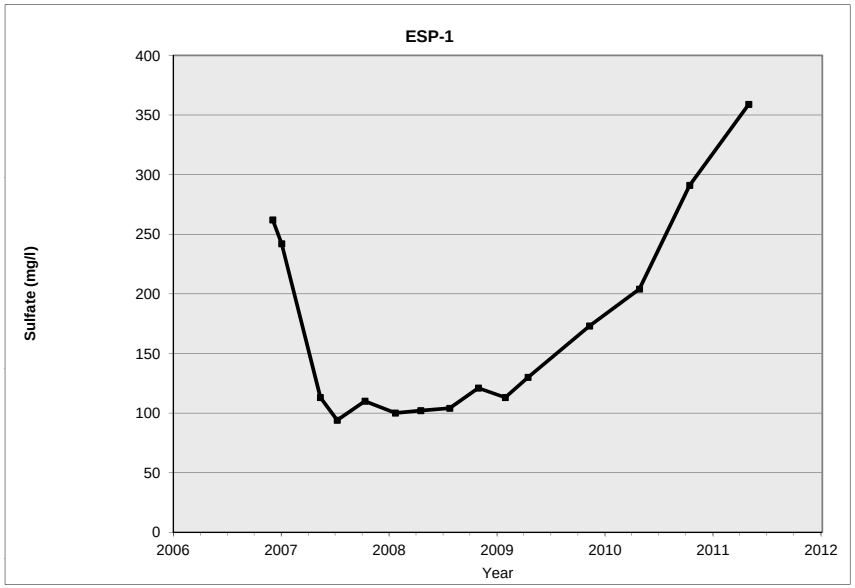
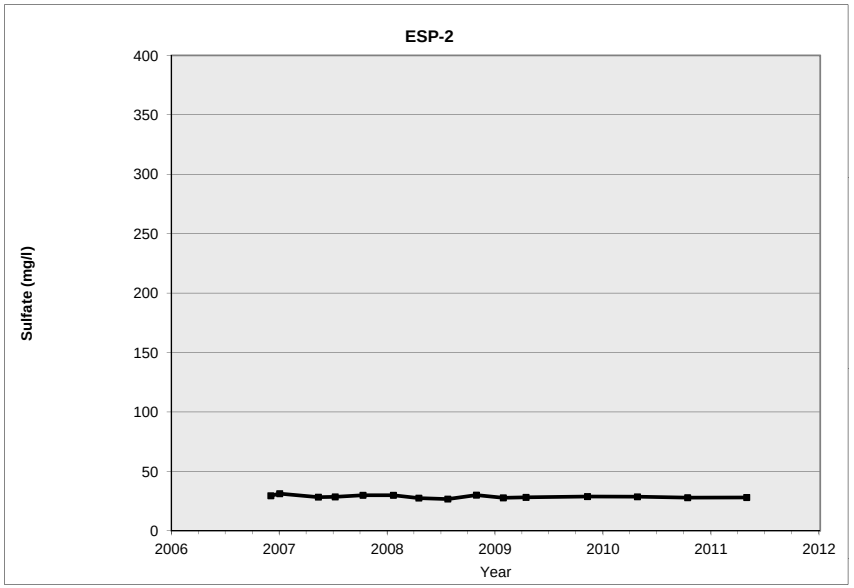
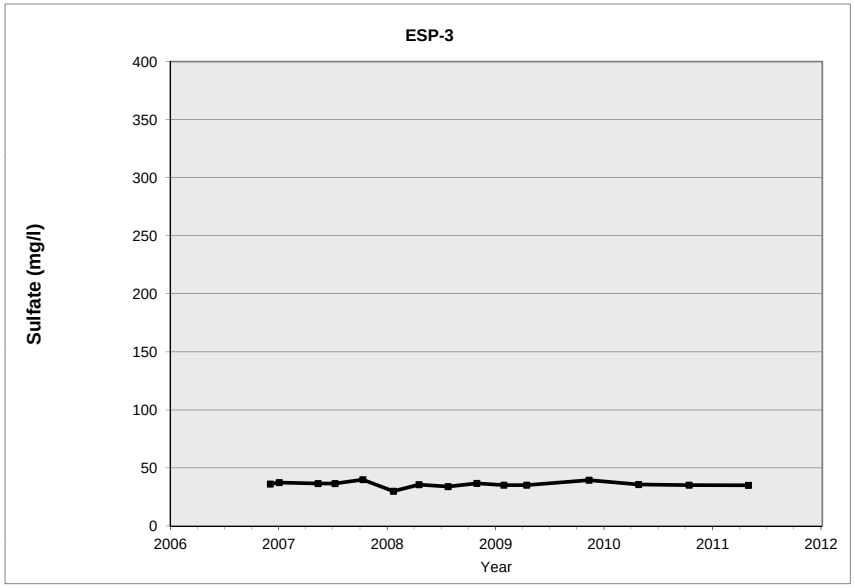


FIGURE C.6
SULFATE CONCENTRATION OVER TIME FOR WELLS
ESP-1, ESP-2, AND ESP-3







APPENDIX D

TIME SERIES GRAPHS OF GROUNDWATER ELEVATION

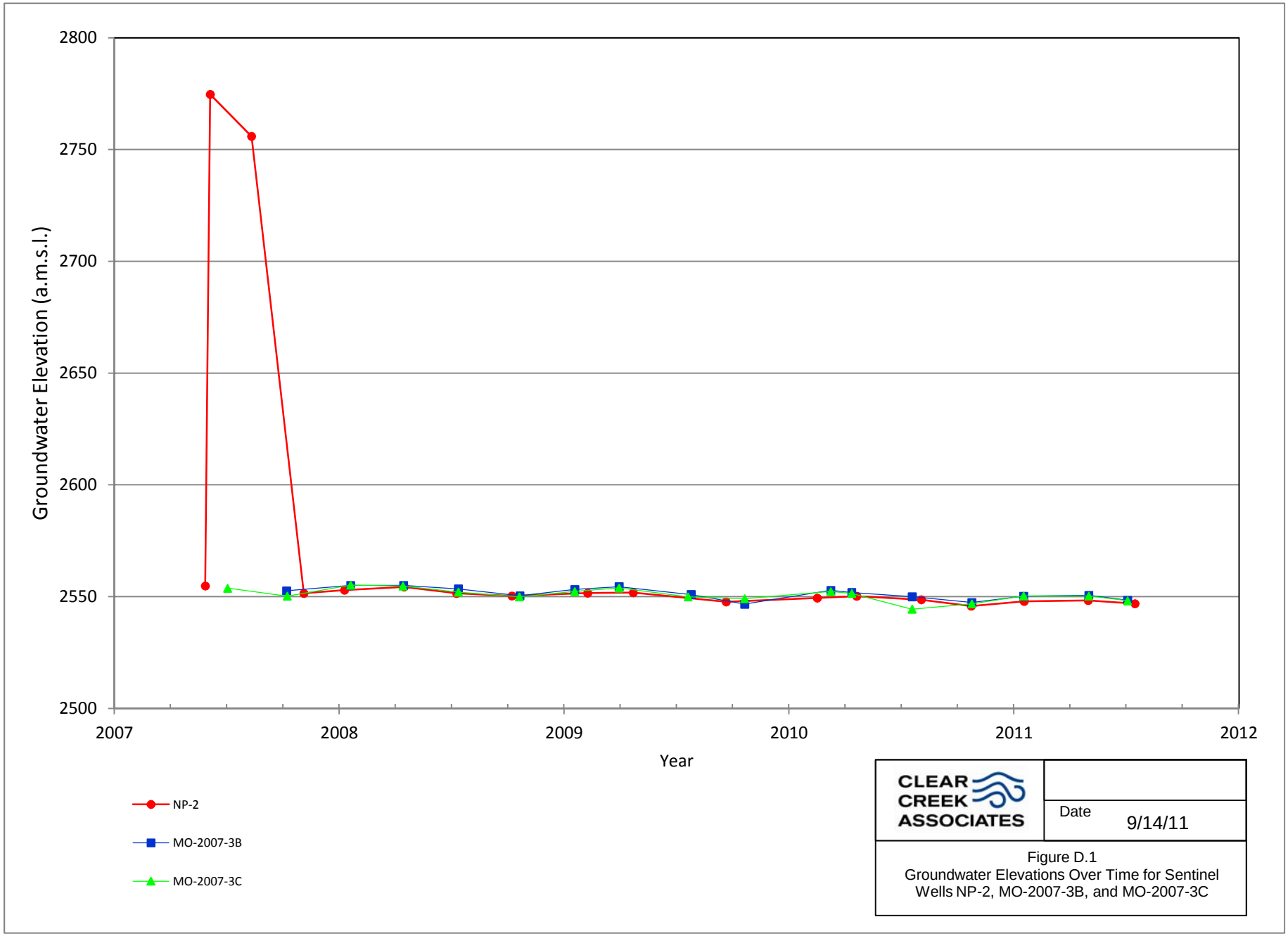


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Figure D.1
Groundwater Elevations Over Time for Sentinel Wells NP-2, MO-2007-3B, and MO-2007-3C

N:\Projects\G & K\055039_Sierrita Mitigation Order\Groundwater Monitoring\Groundwater Monitoring Reports\2011 Q2 and 2011 Q3 Semiannual Report\GW Elevation Time Series for Sentinel Wells.xls

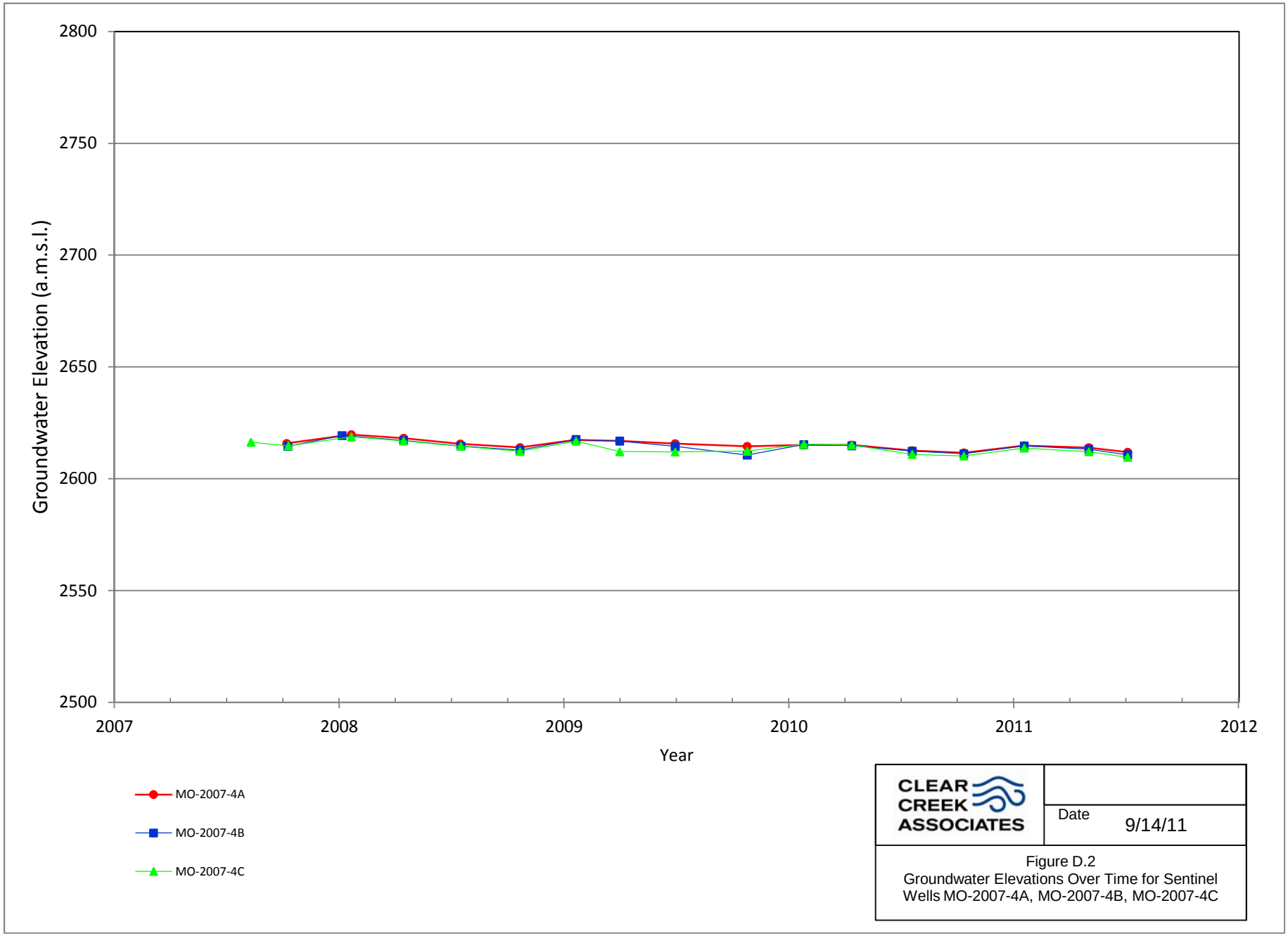

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Figure D.2
Groundwater Elevations Over Time for Sentinel Wells MO-2007-4A, MO-2007-4B, MO-2007-4C

N:\Projects\G & K\055039_Sierrita Mitigation Order\Groundwater Monitoring\Groundwater Monitoring Reports\2011 Q2 and 2011 Q3 Semiannual Report\GW Elevation Time Series for Sentinel Wells.xls

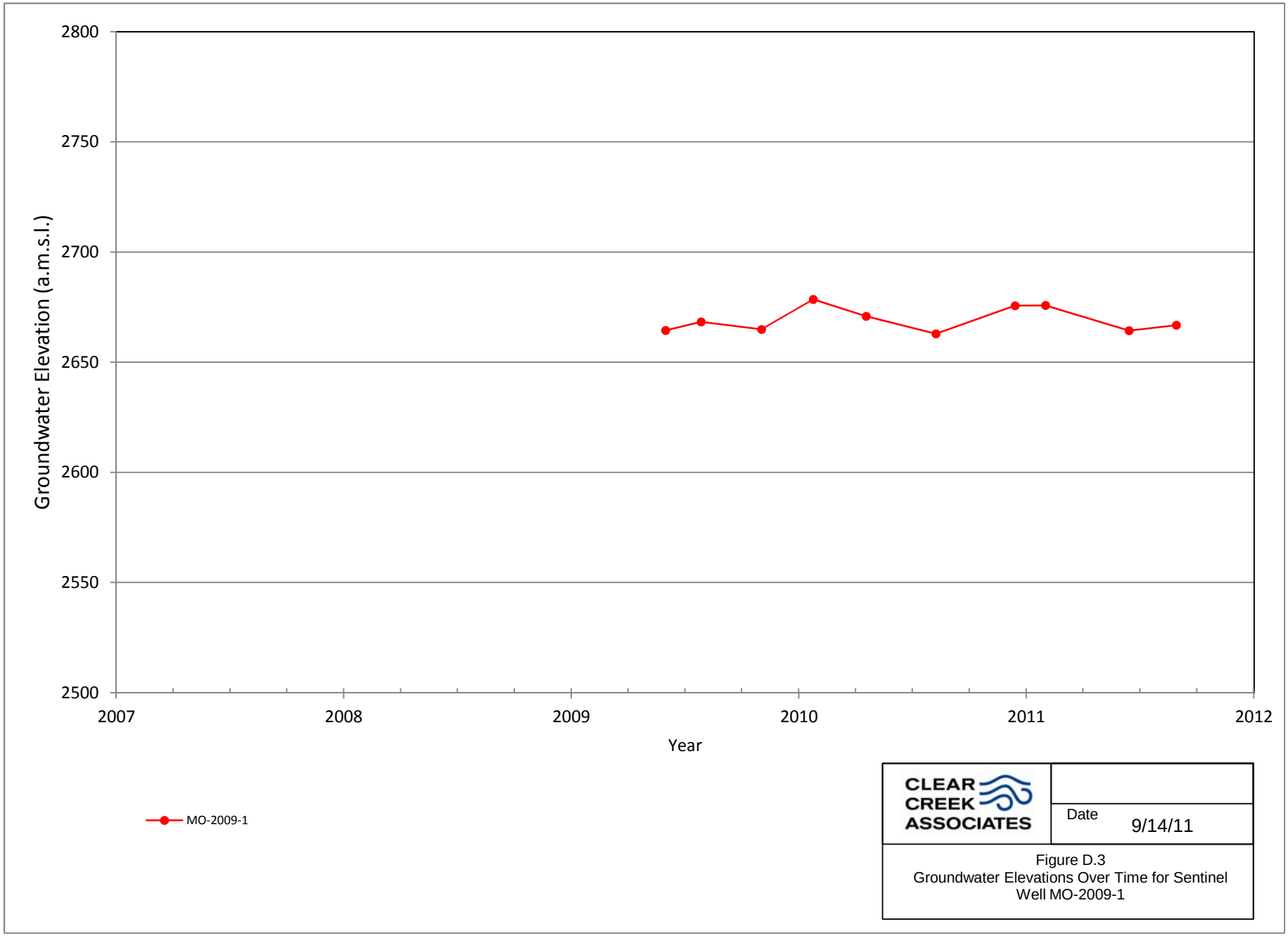

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Figure D.3
Groundwater Elevations Over Time for Sentinel Well MO-2009-1

N:\Projects\G & K\055039_Sierrita Mitigation Order\Groundwater Monitoring\Groundwater Monitoring Reports\2011 Q2 and 2011 Q3 Semiannual Report\GW Elevation Time Series for Sentinel Wells.xls

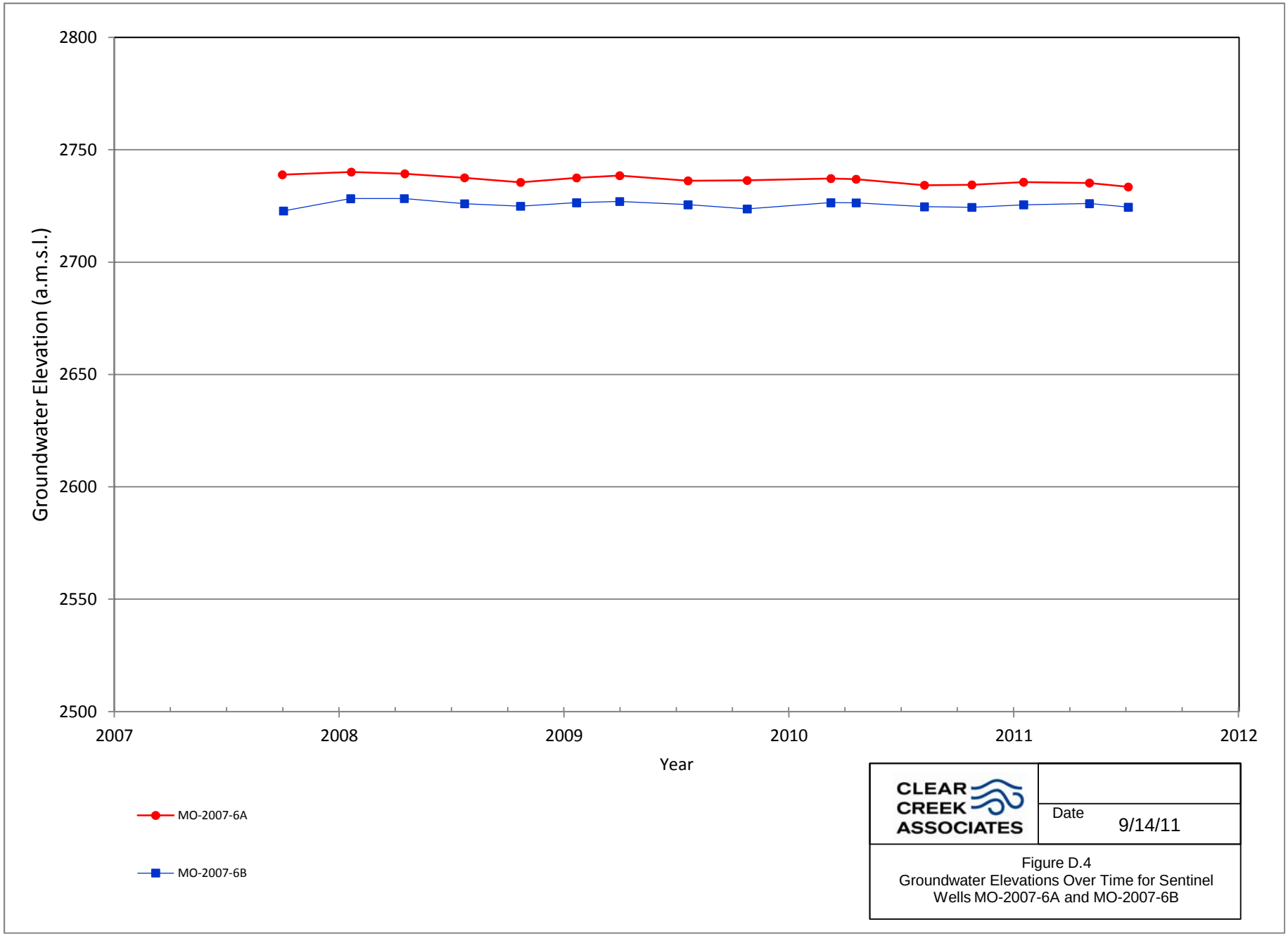

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Figure D.4
Groundwater Elevations Over Time for Sentinel Wells MO-2007-6A and MO-2007-6B

N:\Projects\G & K\055039_Sierrita Mitigation Order\Groundwater Monitoring\Groundwater Monitoring Reports\2011 Q2 and 2011 Q3 Semiannual Report\GW Elevation Time Series for Sentinel Wells.xls