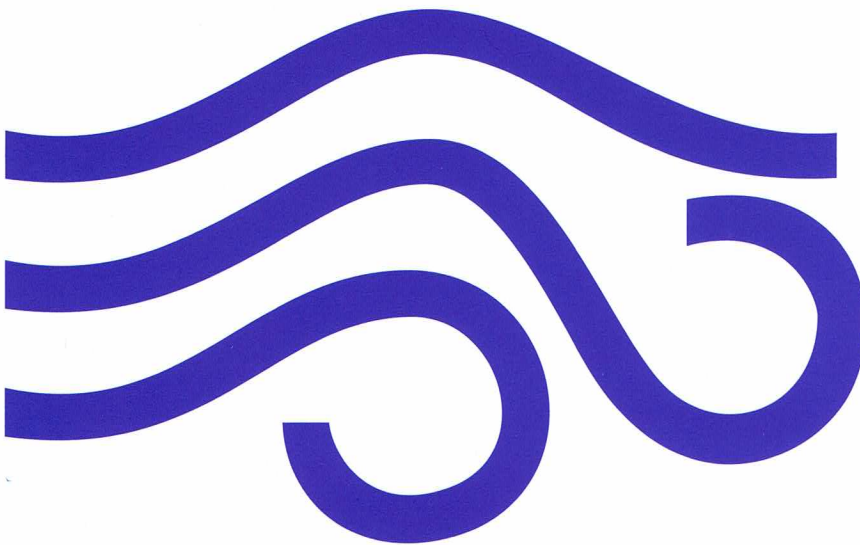


**SEMIANNUAL GROUNDWATER MONITORING REPORT  
FOR SAMPLES COLLECTED DURING THE FOURTH  
QUARTER 2010 AND FIRST QUARTER 2011**

**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:*

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March 29, 2011

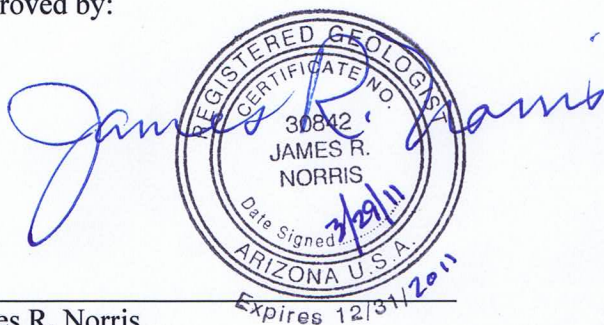
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Approved by:

The seal is circular with a double border. The outer border contains the text "REGISTERED GEOLOGIST" at the top and "ARIZONA U.S.A." at the bottom. The inner circle contains the text "CERTIFICATE NO. 30842" and "JAMES R. NORRIS". Below the name, there is a line for "Date Signed" with the handwritten date "3/29/11" in blue ink. At the bottom of the seal, it says "Expires 12/31/2011".

James R. Norris  
Arizona Registered Geologist No. 30842

March 29, 2011

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## 1. INTRODUCTION

This report provides the results of groundwater monitoring conducted in the fourth quarter 2010 and the first quarter 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 fourth quarter 2010 and first quarter 2011 are tabulated in Table 2 and Table 3, respectively. Figure 2 shows the concentrations of dissolved sulfate in the wells sampled in the fourth quarter 2010. 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 first quarter 2011. The highest sulfate concentration measured at co-located wells was used for concentration contouring. Groundwater elevations in the fourth quarter 2010 and first quarter 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 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 fourth quarter 2010 and first quarter 2011, and is included as Appendix A. Analytical laboratory reports for samples collected in the fourth quarter 2010 and first quarter 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 fourth quarter 2010 and first quarter 2011 (Table 1). Groundwater samples and depth to water measurements were collected from 29 plume area wells during the fourth quarter 2010. In the first quarter 2011 groundwater samples and 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.

- 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 fourth quarter 2010 and first quarter 2011 sulfate concentration data with those collected in previous quarters indicates that 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-2009-1, MO-2007-1B, MO-2007-1C, and ESP-1. The limited data available at MO-2009-1 are insufficient to determine the long term trend. 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 generally increased through the first and second quarters and decreased through 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
1350	ND	TBPI	WLO			
CC OF GV	501760	CC of GV	✓			
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-5	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	✓			
IW-17	545560	Sierrita	✓			
IW-18	545561	Sierrita	✓			
IW-19	545562	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-20	545563	Sierrita	✓			
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	✓		✓	



**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-2007-1B	907210	Sierrita	✓		✓	
MO-2007-1C	907209	Sierrita	✓		✓	
MO-2007-2	906765	Sierrita	✓			
MO-2007-3B <sup>1</sup>	906816	Sierrita	✓	✓	✓	✓
MO-2007-3C <sup>1</sup>	906817	Sierrita	✓	✓	✓	✓
MO-2007-4A <sup>2</sup>	907213	Sierrita	✓	✓	✓	✓
MO-2007-4B <sup>2</sup>	907212	Sierrita	✓	✓	✓	✓
MO-2007-4C <sup>2</sup>	907211	Sierrita	✓	✓	✓	✓
MO-2007-5B	907456	Sierrita	✓		✓	
MO-2007-5C	907457	Sierrita	✓		✓	
MO-2007-6A <sup>3</sup>	907607	Sierrita	✓	✓	✓	✓
MO-2007-6B <sup>3</sup>	907606	Sierrita	✓	✓	✓	✓
MO-2009-1 <sup>4</sup>	910458	Sierrita	✓	✓	✓	✓
NP-2 <sup>1</sup>	605898	CWC	✓	✓	✓	✓
PZ-7	561870	Sierrita	✓			
PZ-8	561866	Sierrita	✓			
TMM-1	616156	Pima County	✓		✓	

**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*

<sup>1</sup> *Sentinel Well for CW-9*

<sup>2</sup> *Sentinel Well for CW-6*

<sup>3</sup> *Sentinel Well for GV-01-GVDWID and GV-02-GVDWID*

<sup>4</sup> *Sentinel Well for CW-10*

**TABLE 2**  
**Analytical Results for Fourth Quarter 2010 and First Quarter 2011 Groundwater Monitoring**

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temperature (deg C)	Specific Conductance (µS/cm)	Sulfate, dissolved (mg/L)
CW-3	627483	10/25/10	7.60	25.5	460	57.6
CW-6	627485	10/14/10	7.67	26.2	429	52.5
		2/24/11	7.57	23.4	455	70.3
CW-9	588121	10/14/10	7.72	27.5	389	44.2
		2/24/11	7.75	26.3	347	42.7
CW-10	207982	10/14/10	7.74	30.2	377	48.5
		2/24/11	7.83	29.3	346	50.2
		2/24/11 DUP	7.83	29.3	346	50.2
ESP-1	623102	10/15/10	7.49	27.7	953	291
ESP-2	623103	10/15/10	7.78	27.6	355	27.9
		10/15/10 DUP	7.78	27.6	355	27.8
ESP-3	623104	10/15/10	7.76	27.5	356	35.2
ESP-4	623105	10/15/10	7.41	27.9	1356	539
GV-01-GVDWID	603428	10/14/10	7.29	26.4	411	38.4
		1/20/11	7.04	23.0	408	40.0
GV-02-GVDWID	603429	10/14/10	7.36	24.5	629	90.7
		1/20/11	7.37	23.1	611	92.7
M-8	087390	10/21/10	7.64	25.5	435	46.9
M-10	501653	10/21/10	7.76	27.1	585	139
MH-28	903548	10/12/10	6.99	25.3	3460	1820
MH-29	903649	10/12/10	7.04	23.9	3290	1520
MO-2007-1A	907342	10/13/10	7.51	27.5	372	16
MO-2007-1B	907210	10/13/10	7.46	28.7	1026	337
		10/13/10 DUP	7.46	28.7	1026	360
MO-2007-1C	907209	10/13/10	7.72	29.1	1004	377
MO-2007-3B	906816	10/26/10	7.78	26.6	361	39.1
		1/18/11	7.83	27.3	353	38.2
MO-2007-3C	906817	10/26/10	7.92	29.5	471	104
		1/18/11	8.06	29.1	492	106
MO-2007-4A	907213	10/13/10	7.55	26.1	414	35.2
		1/19/11	7.61	25.8	403	35.8
MO-2007-4B	907212	10/13/10	7.69	28.1	378	34.2
		1/19/11	7.73	26.9	367	34.6
		1/19/11 DUP	7.73	26.9	367	34.4
MO-2007-4C	907211	10/13/10	8.19	31.1	462	86.5
		1/19/11	8.21	28.9	447	87.6
MO-2007-5B	907456	12/10/10	7.92	27.1	1215	454
MO-2007-5C	907457	12/10/10	7.95	30.5	709	251
MO-2007-6A	907607	10/26/10	7.74	28.3	381	33.9
		1/18/11	7.71	26.7	376	30.2
MO-2007-6B	907606	10/26/10	7.89	30.8	399	57.7
		1/18/11	7.85	30.4	396	58.5
MO-2009-1	910458	12/15/10	8.29	29.0	504	95
		12/15/10 DUP	8.29	29.0	504	94
		2/2/11	8.69	26.9	432	92
NP-2	605898	10/25/10	7.66	25.3	446	41.4
		1/19/11	7.69	25.5	402	41.9
TMM-1	616156	10/6/10	8.56	27.4	269	<0.5

**Notes:**

ADWR = Arizona Department of Water Resources

SU = Standard Units

µS/cm = microsiemens per centimeter

deg C = degrees Celsius

NA = Not Analyzed

mg/L = milligrams per Liter

DUP = Duplicate sample

**TABLE 3**  
**Groundwater Elevation Data for Fourth Quarter 2010 and First Quarter 2011**

Well Name	ADWR 55 Registry No.	Survey Source	UTM North (m)	UTM East (m)	Measuring Point Elevation (ft amsl)	Date	Depth to Water (feet)	Groundwater Elevation (ft amsl)
CW-3	627483	HGC	3523809.985	500047.663	2941.71	10/25/10	273.54	2668.17
CW-6	627485	CWC	3525794.239	500891.072	2867.00	10/14/10	257.22	2609.78
						2/24/11	250.38	2616.62
CW-9	588121	CWC	3528740.784	501072.040	2834.30	10/14/10	318.65	2515.65
						2/24/11	309.94	2524.36
CW-10	207982	CWC	3523455.502	500913.364	2868.50	10/14/10	195.31	2673.19
						2/24/11	191.62	2676.88
ESP-1	623102	Sierrita	3526448.677	499969.682	2953.43	10/15/10	357.40	2596.03
ESP-2	623103	Sierrita	3526924.656	500241.637	2934.60	10/15/10	347.33	2587.27
ESP-3	623104	Sierrita	3527377.239	500234.067	2935.80	10/15/10	365.00	2570.80
ESP-4	623105	Sierrita	3526132.758	499916.830	2958.60	10/15/10	358.16	2600.44
GV-01-GVDWID	603428	GVDWID	3522254.157	499812.869	2942.35	10/14/10	233.00	2709.35
						3/18/11	224.00	2718.35
GV-02-GVDWID	603429	GVDWID	3521654.457	499786.207	2930.47	10/14/10	204.55	2725.92
						1/20/11	198.88	2731.59
M-8	87390	Sierrita	3529692.237	499658.916	2999.53	10/21/10	471.61	2527.92
M-10	501653	Sierrita	3530143.114	499659.027	3005.68	10/21/10	486.40	2519.28
MH-28	903548	Sierrita	3524609.980	497471.427	3142.18	10/12/10	399.00	2743.18
MH-29	903649	Sierrita	3522805.518	497604.326	3123.15	10/12/10	379.31	2743.84
MO-2007-1A	907342	Sierrita	3529331.380	500016.947	2967.65	10/13/10	434.09	2533.56
MO-2007-1B	907210	Sierrita	3529325.119	500021.574	2966.82	10/13/10	434.47	2532.35
MO-2007-1C	907209	Sierrita	3529328.959	500013.405	2968.58	10/13/10	431.88	2536.70
MO-2007-3B	906816	Sierrita	3528508.801	500522.491	2912.15	10/26/10	364.82	2547.33
						1/18/11	361.99	2550.16
MO-2007-3C	906817	Sierrita	3528508.743	500529.713	2911.90	10/26/10	365.13	2546.77
						1/18/11	361.62	2550.28
MO-2007-4A	907213	Sierrita	3525634.956	500383.682	2923.63	10/13/10	312.00	2611.63
						1/19/11	308.82	2614.81
MO-2007-4B	907212	Sierrita	3525613.952	500380.947	2923.57	10/13/10	312.39	2611.18
						1/19/11	308.84	2614.73
MO-2007-4C	907211	Sierrita	3525624.484	500382.217	2923.66	10/13/10	313.49	2610.17
						1/19/11	309.94	2613.72
MO-2007-5B	907456	Sierrita	3523743.376	500013.850	2944.35	12/10/11	272.31	2672.04
MO-2007-5C	907457	Sierrita	3523736.459	500014.152	2944.91	12/10/11	278.31	2666.60

**TABLE 3**  
**Groundwater Elevation Data for Fourth Quarter 2010 and First Quarter 2011**

Well Name	ADWR 55 Registry No.	Survey Source	UTM North (m)	UTM East (m)	Measuring Point Elevation (ft amsl)	Date	Depth to Water (feet)	Groundwater Elevation (ft amsl)
MO-2007-6A	907607	Sierrita	3521842.050	498367.161	3043.37	10/26/10	308.95	2734.42
						1/18/11	307.78	2735.59
MO-2007-6B	907606	Sierrita	3521849.495	498367.887	3043.05	10/26/10	318.66	2724.39
						1/18/11	317.52	2725.53
MO-2009-1	910458	Sierrita	3523369.438	500534.089	2890.78	12/15/10	215.16	2675.62
						2/2/11	214.99	2675.79
NP-2	605898	HGC	3528517.116	500582.904	2906.56	10/25/10	360.80	2545.76
						1/19/11	358.68	2547.88
TMM-1	616156	HGC	3529736.231	500018.323	2967.08	10/6/10	442.98	2524.10

*Notes:*

*ADWR = Arizona Department of Water Resources*

*UTM = Universal Transverse Mercator, Zone 12 North American Datum 1983 (NAD83)*

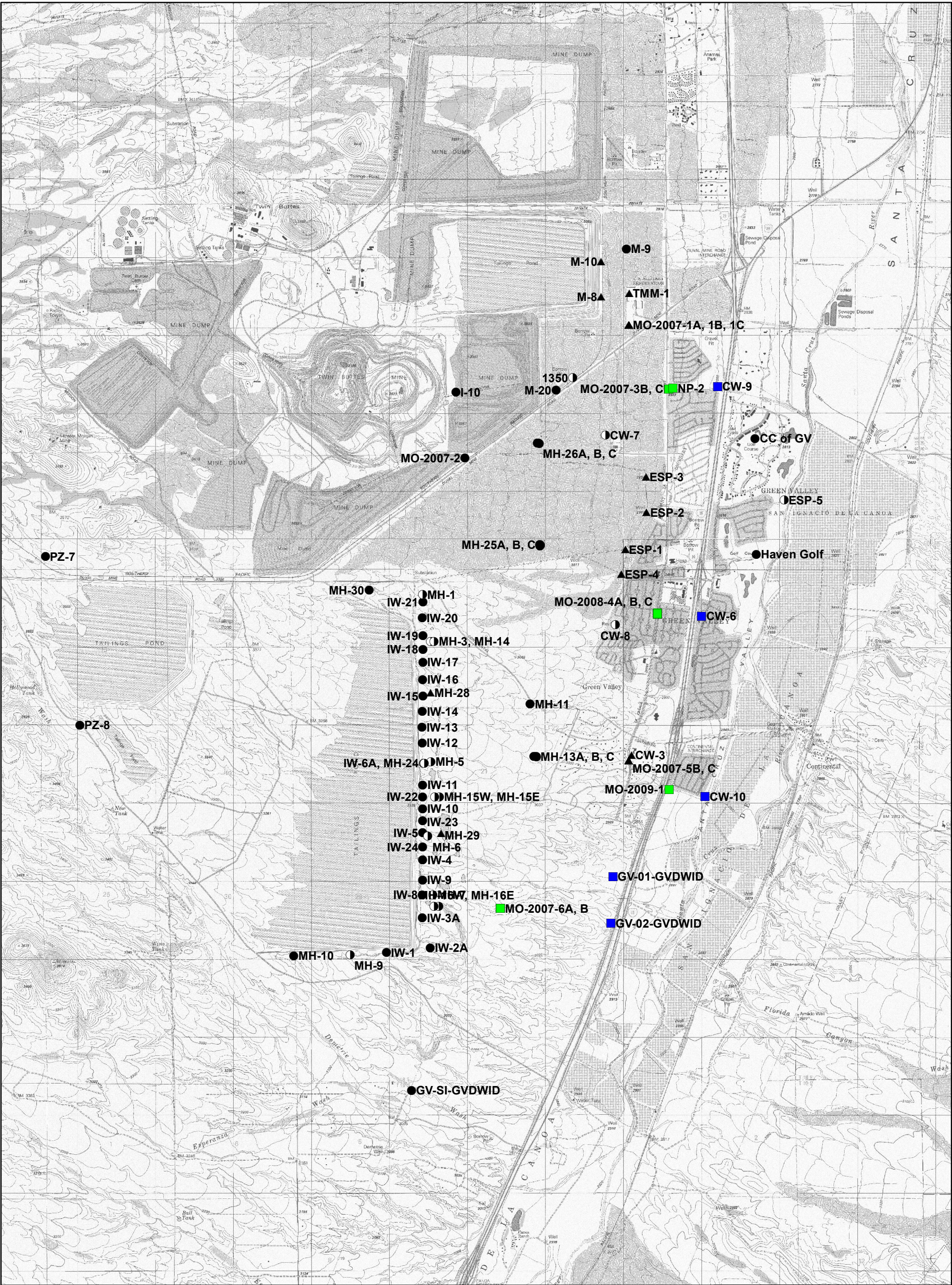
*ft amsl = feet above mean sea level*

*Water level measurement for IW were collected under dynamic conditions and not used for contouring*

*HGC = Hydro Geo Chem, Inc.*

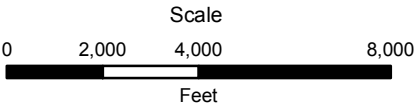
## FIGURES





Legend

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





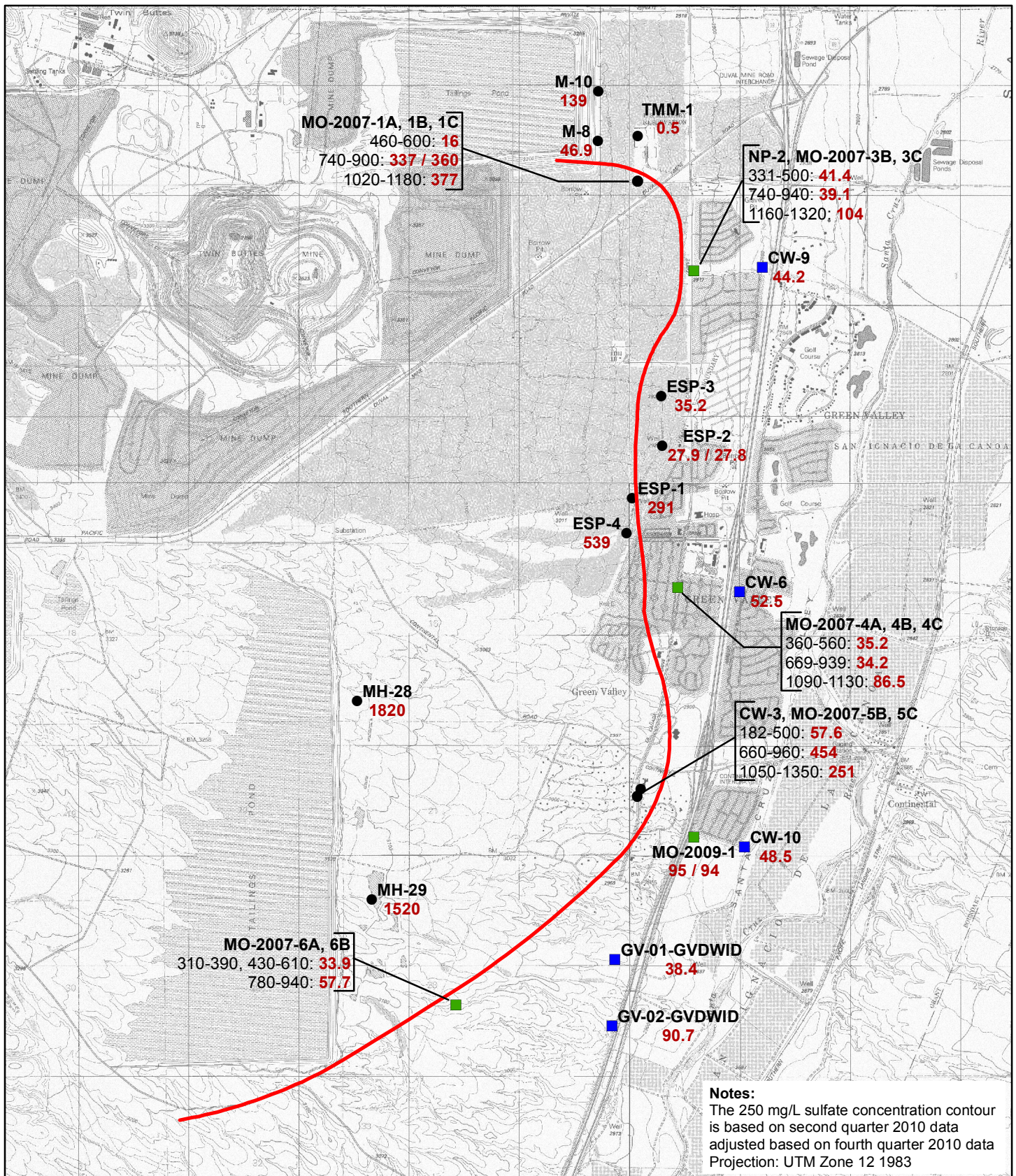
Date	1/20/10	File ID	055038-006A
			

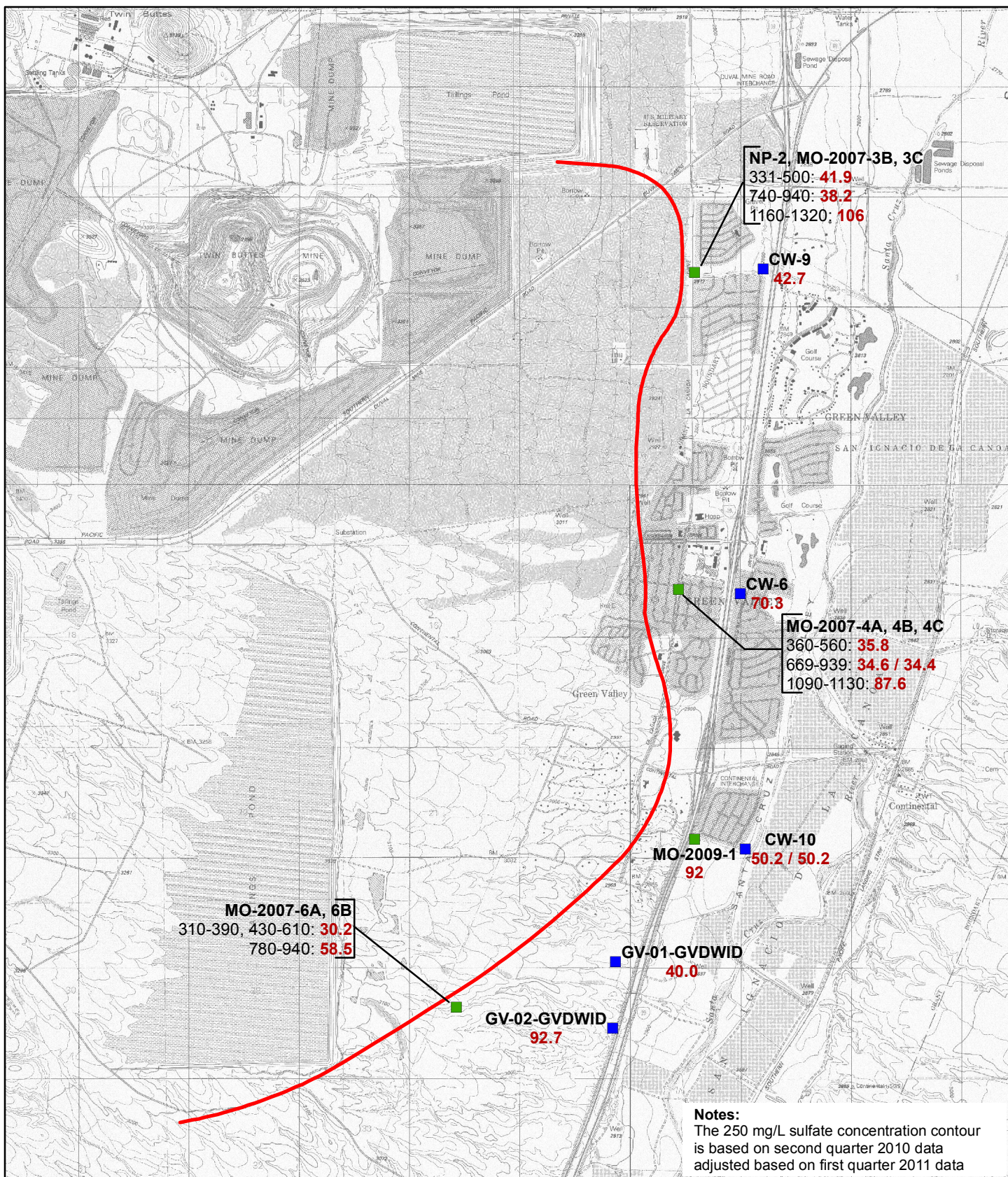
Figure 1  
Sampling Locations for  
Pre-Implementation Groundwater  
Monitoring





<p><b>Legend</b></p> <ul style="list-style-type: none"> <li>Red line: 250 mg/L Sulfate Concentration Contour</li> <li>Black dot: Well</li> <li>Blue square: Water Supply Well</li> <li>Green square: Sentinel Well</li> </ul>		<p>0 2,000 4,000 Feet</p>		<p><b>CLEAR CREEK ASSOCIATES</b></p>		<p>File ID: 055039-046 Date: 3/16/11</p>	
<p><b>Co-Located Wells</b></p> <ul style="list-style-type: none"> <li>Screened Interval (ft bls): Sulfate Concentration (mg/L)</li> </ul>		<p>North Arrow</p>		<p><b>Figure 2</b> Sulfate Concentrations for Fourth Quarter 2010</p>			





#### Legend

— 250 mg/L Sulfate Concentration Contour

● **CW-9**

Well ID

**42.7**

Sulfate Concentration (mg/L)

Duplicate Results Separated by "/"

#### Well Symbols

● Well

■ Water Supply Well

■ Sentinel Well

0 2,000 4,000

Feet

**CLEAR CREEK ASSOCIATES**

File ID

055039-052

Date

3/16/11

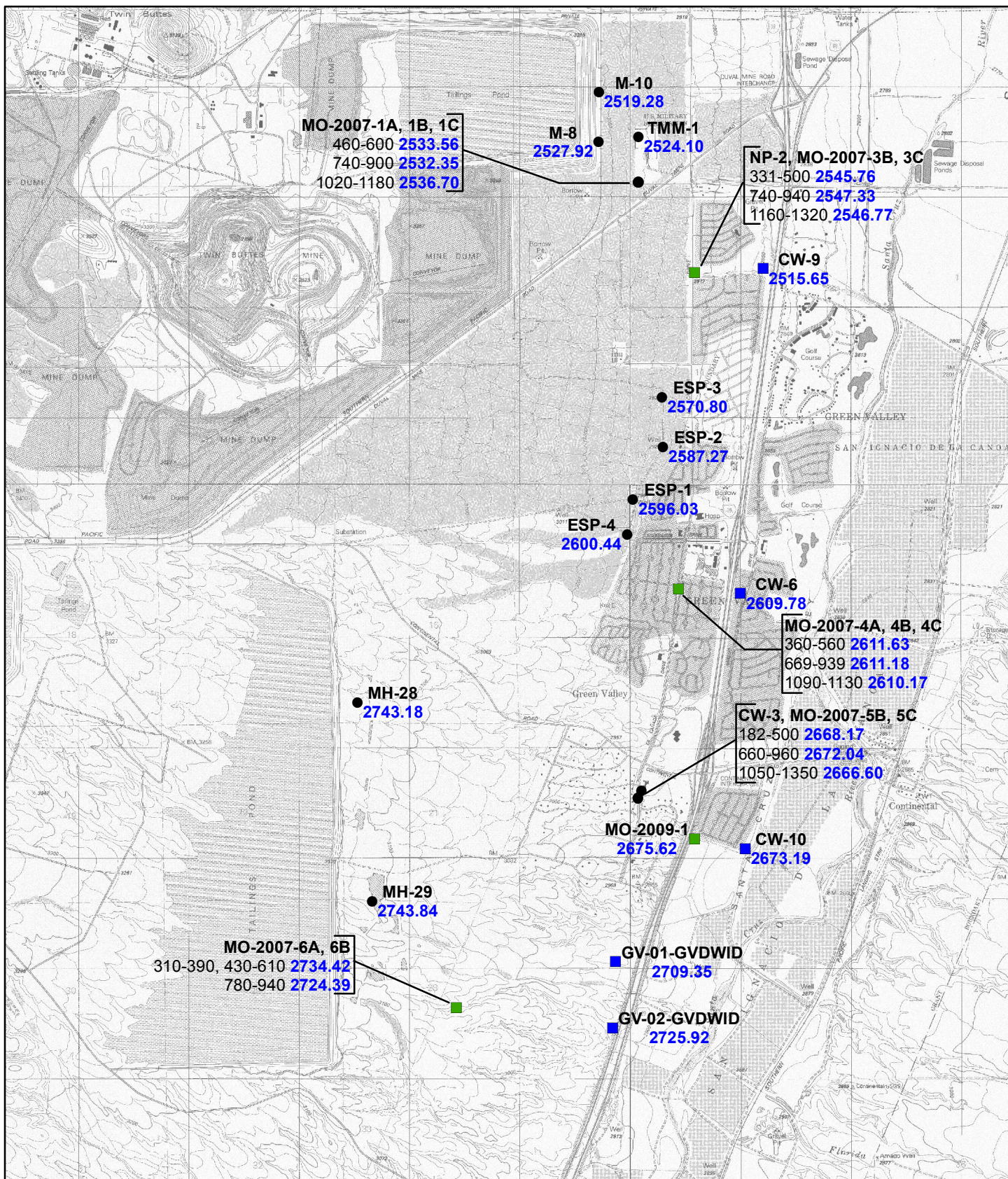
Co-Located Wells

— Screened Interval (ft bls): **Sulfate Concentration (mg/L)**



Figure 3  
Sulfate Concentrations  
for First Quarter 2011





#### Legend

● **CW-9** Well ID  
**2515.65** Groundwater Elevation (ft amsl)

Well Symbols  
 ● Well  
 ■ Water Supply Well  
 ■ Sentinel Well

0 2,000 4,000  
 Feet

**CLEAR CREEK ASSOCIATES**

File ID 055039-045  
 Date 3/16/11

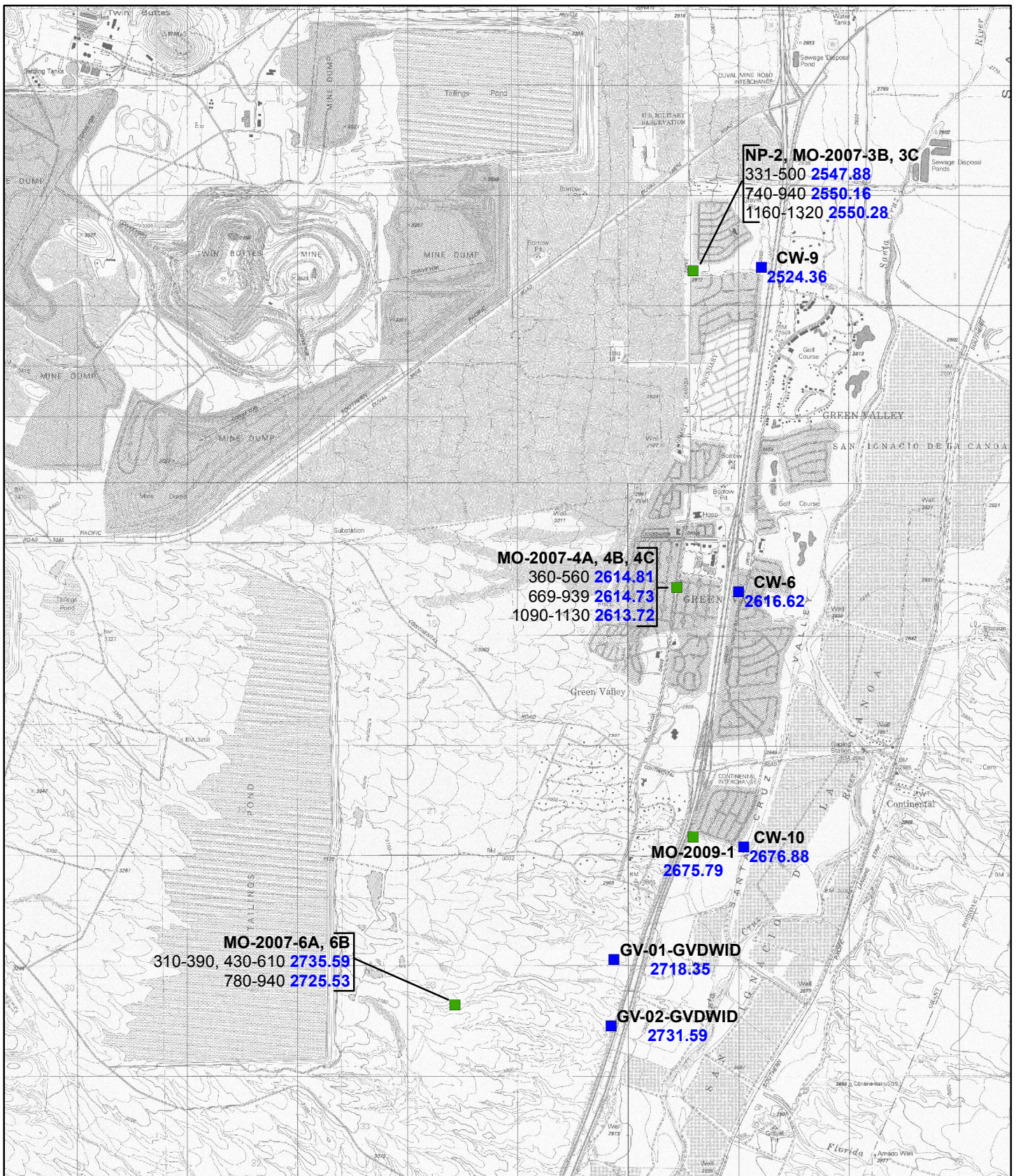
Co-Located Wells

— Screened Interval (ft bls): **Groundwater Elevation (ft amsl)**



Figure 4  
 Groundwater Elevations  
 for Fourth Quarter 2010





#### Legend

● **CW-9** Well ID  
**2524.36** Grounwater Elevation (ft amsl)

#### Well Symbols

● Well  
 ■ Water Supply Well  
 ■ Sentinel Well

0 2,000 4,000  
 Feet

**CLEAR CREEK ASSOCIATES**

File ID 055039-053

Date 3/16/11

#### Co-Located Wells

— Screened Interval (ft bls): **Grounwater Elevation (ft amsl)**



Figure 5  
 Groundwater Elevations  
 for First Quarter 2011



**APPENDIX A**

**DATA VERIFICATION REPORT**

**GROUNDWATER SAMPLES COLLECTED BY FREEPORT-MCMORAN  
SIERRITA INC. DURING FOURTH QUARTER 2010 AND FIRST QUARTER 2011**

**APPENDIX A**  
**DATA VERIFICATION REPORT**

**GROUNDWATER SAMPLES COLLECTED BY FREEPORT-MCMORAN  
SIERRITA INC. DURING THE FOURTH QUARTER 2010 AND FIRST QUARTER 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

March 29, 2011

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## 1. INTRODUCTION

This report summarizes the data verification review of groundwater samples collected and analyzed during the fourth quarter 2010 and first quarter 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 48 samples collected are contained in 8 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
<u>Fourth Quarter 2010</u> Number of well samples collected: 29 Number of duplicate samples collected: 3 Total number of samples collected: 32	
<a href="#">L84833</a>	MH-28, MH-29
<a href="#">L84985</a>	TMM-1, MO-2007-4A, MO-2007-4B, MO-2007-4C, MO-2007-1A, MO-2007-1B, MO-2007-1C, DUP20101013A, CW-10, CW-6, CW-9, GV-1, GV-2, ESP-2, ESP-3, ESP-1, ESP-4, DUP201015A
<a href="#">L85034</a>	M-8, M-10
<a href="#">L85112</a>	CW-3, NP-2, MO-2007-3B, MO-2007-3C, MO-2007-6A, MO-2007-6B
<a href="#">L85209</a>	RE-ISSUED for MO-2007-1B, MO-2007-1C, ESP-1
<a href="#">L85886</a>	MO-2007--5B, MO2007-5C, MO-2009-1, DUP 20101215B
<u>First Quarter 2011</u> Number of well samples collected: 14 Number of duplicate samples collected: 2 Total number of samples collected: 16	
<a href="#">L86296</a>	MO-2007-3B, MO-2007-3C, MO-2007-6A, MO-2007-6B, MO-2007-4B, MO-2007-4C, MO-2007-4A, NP-2, GV-1, GV-2, DUP20110119A
<a href="#">L86739</a>	MO-2009-1, CW-10, CW-6, CW-9, DUP20110224A

## **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)

### **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 <sup>1</sup> (mg/L)
EPA 300.0	0.5	3	10
EPA 375.4	1	5	10

mg/L = milligrams per liter

<sup>1</sup> 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 submitted for sulfate analyses. 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. If there are any cases where a qualifier is used the method control sample recovery is 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. In some instances, the data were qualified with an “RA” flag indicating that the RPD was not used for data validation because the sample concentration was less than ten times the MDL, which is too low for accurate evaluation according to ACZ. In cases where the RPD could be calculated, the results met QA criteria and demonstrate an appropriate level of precision in 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 the fourth quarter 2009 and first quarter 2010 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 for any laboratory duplicates. During this monitoring period, a total of 5 field duplicate samples were collected by Sierrita for filtered sulfate analysis (DUP20101013A, DUP20101015A, DUP20101215B, DUP20110119A, and DUP20110224A). The collection of 5 field duplicate samples meets 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 6.60 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
L84985	ESP-2	DUP20101013A	27.9	27.8	0.36%
L84985	MO-2007-1B	DUP20101015A	337	360	6.60%
L85886	MO-2009-1	DUP20101215B	95	94	1.06%
L86296	MO-2007-4B	DUP20110119A	34.6	34.4	0.58%
L86739	CW-10	DUP20110224A	50.2	50.2	0.00%

*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**

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

October 27, 2010

**Cc: Ben Daigneau**

Project ID: ZS02JH  
ACZ Project ID: L84833- **SULFATE ONLY**

Korky Vault:

Enclosed are analytical reports for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 13, 2010. This project was assigned to ACZ's project number, L84833. 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 L84833. 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.



Scott Habermehl has reviewed  
and approved this report.





**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MH-28

ACZ Sample ID: **L84833-01**

Date Sampled: 10/12/10 10:15

Date Received: 10/13/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	D516-02 - Turbidimetric	1820		*	mg/L	50	300	10/26/10 9:51	jlf

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MH-29

ACZ Sample ID: **L84833-02**

Date Sampled: 10/12/10 08:59

Date Received: 10/13/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	D516-02 - Turbidimetric	1520		*	mg/L	50	300	10/26/10 9:51	jlf

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: **L84833**

Project ID: ZS02JH

**Antimony, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291805</b>													
WG291805ICV	ICV	10/21/10 2:36	MS100812-2	.02		.0208	mg/L	104	90	110			
WG291805ICB	ICB	10/21/10 2:40				.00051	mg/L		-0.00088	0.00088			
WG291805LFB	LFB	10/21/10 2:47	MS101019-3	.01		.00953	mg/L	95.3	85	115			
L84811-11AS	AS	10/21/10 3:44	MS101019-3	.5	U	.462	mg/L	92.4	70	130			
L84811-11ASD	ASD	10/21/10 3:48	MS101019-3	.5	U	.478	mg/L	95.6	70	130	3.4	20	

**Arsenic, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291805</b>													
WG291805ICV	ICV	10/21/10 2:36	MS100812-2	.05		.05231	mg/L	104.6	90	110			
WG291805ICB	ICB	10/21/10 2:40				U	mg/L		-0.0011	0.0011			
WG291805LFB	LFB	10/21/10 2:47	MS101019-3	.05005		.05147	mg/L	102.8	85	115			
L84811-11AS	AS	10/21/10 3:44	MS101019-3	2.5025	.04	2.396	mg/L	94.1	70	130			
L84811-11ASD	ASD	10/21/10 3:48	MS101019-3	2.5025	.04	2.367	mg/L	93	70	130	1.22	20	

**Beryllium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291805</b>													
WG291805ICV	ICV	10/21/10 2:36	MS100812-2	.05		.04934	mg/L	98.7	90	110			
WG291805ICB	ICB	10/21/10 2:40				U	mg/L		-0.00022	0.00022			
WG291805LFB	LFB	10/21/10 2:47	MS101019-3	.05005		.04938	mg/L	98.7	85	115			
L84811-11AS	AS	10/21/10 3:44	MS101019-3	2.5025	U	2.402	mg/L	96	70	130			
L84811-11ASD	ASD	10/21/10 3:48	MS101019-3	2.5025	U	2.412	mg/L	96.4	70	130	0.42	20	

**Cadmium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291805</b>													
WG291805ICV	ICV	10/21/10 2:36	MS100812-2	.05		.05065	mg/L	101.3	90	110			
WG291805ICB	ICB	10/21/10 2:40				U	mg/L		-0.00022	0.00022			
WG291805LFB	LFB	10/21/10 2:47	MS101019-3	.05005		.04932	mg/L	98.5	85	115			
L84811-11AS	AS	10/21/10 3:44	MS101019-3	2.5025	U	2.3955	mg/L	95.7	70	130			
L84811-11ASD	ASD	10/21/10 3:48	MS101019-3	2.5025	U	2.4235	mg/L	96.8	70	130	1.16	20	

**Chromium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291456</b>													
WG291456ICV	ICV	10/15/10 9:48	II100817-1	2		1.913	mg/L	95.7	95	105			
WG291456ICB	ICB	10/15/10 9:51				U	mg/L		-0.03	0.03			
<b>WG291509</b>													
WG291509LFB	LFB	10/15/10 12:24	II101007-3	.5		.484	mg/L	96.8	85	115			
L84833-01AS	AS	10/15/10 13:22	II101007-3	.5	U	.464	mg/L	92.8	85	115			
L84833-01ASD	ASD	10/15/10 13:26	II101007-3	.5	U	.466	mg/L	93.2	85	115	0.43	20	



**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L84833**

Project ID: ZS02JH

**Cobalt, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291456</b>													
WG291456ICV	ICV	10/15/10 9:48	II100817-1	2		1.893	mg/L	94.7	95	105			
WG291456ICB	ICB	10/15/10 9:51				U	mg/L		-0.03	0.03			
<b>WG291509</b>													
WG291509LFB	LFB	10/15/10 12:24	II101007-3	.5		.469	mg/L	93.8	85	115			
L84833-01AS	AS	10/15/10 13:22	II101007-3	.5	U	.437	mg/L	87.4	85	115			
L84833-01ASD	ASD	10/15/10 13:26	II101007-3	.5	U	.434	mg/L	86.8	85	115	0.69	20	

**Copper, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291456</b>													
WG291456ICV	ICV	10/15/10 9:48	II100817-1	2		1.929	mg/L	96.5	95	105			
WG291456ICB	ICB	10/15/10 9:51				U	mg/L		-0.03	0.03			
<b>WG291509</b>													
WG291509LFB	LFB	10/15/10 12:24	II101007-3	.5		.47	mg/L	94	85	115			
L84833-01AS	AS	10/15/10 13:22	II101007-3	.5	U	.457	mg/L	91.4	85	115			
L84833-01ASD	ASD	10/15/10 13:26	II101007-3	.5	U	.46	mg/L	92	85	115	0.65	20	

**Fluoride**

SM4500F-C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291575</b>													
WG291575ICV	ICV	10/16/10 10:15	WC101013-1	2		2.05	mg/L	102.5	95	105			
WG291575ICB	ICB	10/16/10 10:23				U	mg/L		-0.3	0.3			
WG291575LFB1	LFB	10/16/10 10:29	WC100707-3	5		5.07	mg/L	101.4	90	110			
WG291575LFB2	LFB	10/16/10 13:11	WC100707-3	5		4.95	mg/L	99	90	110			
L84812-16AS	AS	10/16/10 15:28	WC100707-3	5	14.4	14.69	mg/L	5.8	90	110			M2
L84812-16DUP	DUP	10/16/10 15:36			14.4	14.28	mg/L				0.8	20	

**Lead, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291805</b>													
WG291805ICV	ICV	10/21/10 2:36	MS100812-2	.05		.05259	mg/L	105.2	90	110			
WG291805ICB	ICB	10/21/10 2:40				U	mg/L		-0.00022	0.00022			
WG291805LFB	LFB	10/21/10 2:47	MS101019-3	.05005		.0531	mg/L	106.1	85	115			
L84811-11AS	AS	10/21/10 3:44	MS101019-3	2.5025	.011	2.5775	mg/L	102.6	70	130			
L84811-11ASD	ASD	10/21/10 3:48	MS101019-3	2.5025	.011	2.5825	mg/L	102.8	70	130	0.19	20	

**Magnesium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291456</b>													
WG291456ICV	ICV	10/15/10 9:48	II100817-1	100		99.33	mg/L	99.3	95	105			
WG291456ICB	ICB	10/15/10 9:51				.24	mg/L		-0.6	0.6			
<b>WG291509</b>													
WG291509LFB	LFB	10/15/10 12:24	II101007-3	49.99941		48.34	mg/L	96.7	85	115			
L84833-01AS	AS	10/15/10 13:22	II101007-3	49.99941	84.4	126.48	mg/L	84.2	85	115			MA
L84833-01ASD	ASD	10/15/10 13:26	II101007-3	49.99941	84.4	126.92	mg/L	85	85	115	0.35	20	

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L84833**

Project ID: ZS02JH

**Molybdenum, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291456</b>													
WG291456ICV	ICV	10/15/10 9:48	II100817-1	2		1.922	mg/L	96.1	95	105			
WG291456ICB	ICB	10/15/10 9:51				U	mg/L		-0.03	0.03			
<b>WG291509</b>													
WG291509LFB	LFB	10/15/10 12:24	II101007-3	.5		.479	mg/L	95.8	85	115			
L84833-01AS	AS	10/15/10 13:22	II101007-3	.5	.03	.488	mg/L	91.6	85	115			
L84833-01ASD	ASD	10/15/10 13:26	II101007-3	.5	.03	.484	mg/L	90.8	85	115	0.82	20	

**Nickel, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291456</b>													
WG291456ICV	ICV	10/15/10 9:48	II100817-1	2.002		1.928	mg/L	96.3	95	105			
WG291456ICB	ICB	10/15/10 9:51				.012	mg/L		-0.03	0.03			
<b>WG291509</b>													
WG291509LFB	LFB	10/15/10 12:24	II101007-3	.5		.487	mg/L	97.4	85	115			
L84833-01AS	AS	10/15/10 13:22	II101007-3	.5	U	.446	mg/L	89.2	85	115			
L84833-01ASD	ASD	10/15/10 13:26	II101007-3	.5	U	.45	mg/L	90	85	115	0.89	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
<b>WG291916</b>													
WG291916ICV	ICV	10/21/10 20:36	WI100928-1	2.416		2.375	mg/L	98.3	90	110			
WG291916ICB	ICB	10/21/10 20:37				U	mg/L		-0.06	0.06			
<b>WG291919</b>													
WG291919LFB	LFB	10/21/10 22:20	WI100921-9	2		1.961	mg/L	98.1	90	110			
L84680-01AS	AS	10/21/10 22:23	WI100921-9	2	.02	1.212	mg/L	59.6	90	110			M2
L84680-02DUP	DUP	10/21/10 22:26			.09	.087	mg/L				3.4	20	RA

**Residue, Filterable (TDS) @180C**

SM2540C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291536</b>													
WG291536PBW	PBW	10/15/10 12:30				U	mg/L		-20	20			
WG291536LCSW	LCSW	10/15/10 12:30	PCN35381	260		262	mg/L	100.8	80	120			
L84841-01DUP	DUP	10/15/10 12:44			1960	1960	mg/L				0	20	

**Selenium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291887</b>													
WG291887ICV	ICV	10/22/10 2:56	MS101020-1	.05		.054	mg/L	108	90	110			
WG291887ICB	ICB	10/22/10 2:59				.00012	mg/L		-0.00022	0.00022			
WG291887LFB	LFB	10/22/10 3:07	MS101019-3	.05005		.04954	mg/L	99	85	115			
L84811-12AS	AS	10/22/10 4:05	MS101019-3	.05005	.001	.05939	mg/L	116.7	70	130			
L84811-12ASD	ASD	10/22/10 4:09	MS101019-3	.05005	.001	.05884	mg/L	115.6	70	130	0.93	20	

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L84833**

Project ID: ZS02JH

**Sulfate**

D516-02 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292088</b>													
WG292088ICB	ICB	10/26/10 8:22				U	mg/L		-3	3			
WG292088ICV	ICV	10/26/10 8:22	WI101019-5	20		20.7	mg/L	103.5	90	110			
WG292088LFB	LFB	10/26/10 9:37	WI100816-2	10		10.3	mg/L	103	90	110			
L84831-02DUP	DUP	10/26/10 9:47			940	856	mg/L				9.4	20	
L84832-01AS	AS	10/26/10 9:48	SO4TURB5X	10	46	53.4	mg/L	74	90	110			M3

**Thallium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291805</b>													
WG291805ICV	ICV	10/21/10 2:36	MS100812-2	.05		.05351	mg/L	107	90	110			
WG291805ICB	ICB	10/21/10 2:40				U	mg/L		-0.00022	0.00022			
WG291805LFB	LFB	10/21/10 2:47	MS101019-3	.0501		.05095	mg/L	101.7	85	115			
L84811-11AS	AS	10/21/10 3:44	MS101019-3	2.505	.008	2.5085	mg/L	99.8	70	130			
L84811-11ASD	ASD	10/21/10 3:48	MS101019-3	2.505	.008	2.5095	mg/L	99.9	70	130	0.04	20	

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L84833**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L84833-01	WG292088	Sulfate	D516-02 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
L84833-02	WG292088	Sulfate	D516-02 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.



**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L84833**

Wet Chemistry

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

Sulfate

D516-02 - Turbidimetric

**FMI Gold & Copper - Sierrita**  
 ZS02JH

ACZ Project ID: L84833  
 Date Received: 10/13/2010 10:48  
 Received By: gac  
 Date Printed: 10/14/2010

**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)
2750	0.8	14

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

**Notes**

**FMI Gold & Copper - Sierrita**  
 ZS02JH

ACZ Project ID: L84833  
 Date Received: 10/13/2010 10:48  
 Received By: gac  
 Date Printed: 10/14/2010

**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
L84833-01	MH-28		Y		Y							<input type="checkbox"/>
L84833-02	MH-29		Y		Y							<input type="checkbox"/>

**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



Laboratories, Inc.

184833

CHAIN of CUSTODY

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

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

If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #:

Project/PO #: ZS02JH

Reporting state for compliance testing:

Sampler's Name: Korky Vault

Are any samples NRC licensable material? Yes No

SAMPLE IDENTIFICATION

DATE:TIME

Matrix

# of Containers

Quarterly

MH-28

10/12/2010 : 10:15

GW

3

x

MH-29

10/12/2010 : 08:59

GW

3

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 7661

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

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

UPS

10/12/2010: 1400

UPS

10/12/2010 : 1400

10-13-10 1046



November 02, 2010

## 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: ZS02JH

ACZ Project ID: L84985

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 20, 2010. This project has been assigned to ACZ's project number, L84985. 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 L84985. 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 December 02, 2010. 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.



Scott Habermehl has reviewed  
and approved this report.



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: TMM-1

ACZ Sample ID: **L84985-01**

Date Sampled: 10/06/10 09:55

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography		U		mg/L	0.5	3	10/27/10 18:34	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-4A

ACZ Sample ID: **L84985-02**

Date Sampled: 10/13/10 10:19

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	35.2			mg/L	0.5	3	10/27/10 18:55	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-4B

ACZ Sample ID: **L84985-03**

Date Sampled: 10/13/10 09:06

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	34.2			mg/L	0.5	3	10/27/10 19:17	ccp

Arizona license number: AZ0102



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-4C

ACZ Sample ID: **L84985-04**

Date Sampled: 10/13/10 09:22

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	86.5			mg/L	0.5	3	10/27/10 19:38	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-1A

ACZ Sample ID: **L84985-05**

Date Sampled: 10/13/10 13:37

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	16.0			mg/L	0.5	3	10/26/10 22:08	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-1B

ACZ Sample ID: **L84985-06**

Date Sampled: 10/13/10 12:50

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	340			mg/L	3	10	10/27/10 11:53	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-1C

ACZ Sample ID: **L84985-07**

Date Sampled: 10/13/10 13:06

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	376		*	mg/L	3	10	10/26/10 23:33	ccp

**Arizona license number: AZ0102**



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: DUP20101013A

ACZ Sample ID: **L84985-08**

Date Sampled: 10/13/10 00:00

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	360			mg/L	5	30	10/27/10 12:14	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: CW-10

ACZ Sample ID: **L84985-09**

Date Sampled: 10/14/10 08:31

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	48.5			mg/L	0.5	3	10/27/10 0:15	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: CW-6

ACZ Sample ID: **L84985-10**

Date Sampled: 10/14/10 09:14

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	52.5			mg/L	0.5	3	10/27/10 0:57	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: CW-9

ACZ Sample ID: **L84985-11**

Date Sampled: 10/14/10 10:08

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	44.2			mg/L	0.5	3	10/27/10 1:39	ccp

Arizona license number: AZ0102



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: GV-1

ACZ Sample ID: **L84985-12**

Date Sampled: 10/14/10 10:35

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	38.4			mg/L	0.5	3	10/27/10 2:00	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: GV-2

ACZ Sample ID: **L84985-13**

Date Sampled: 10/14/10 11:20

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	90.7			mg/L	0.5	3	10/27/10 2:21	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: ESP-2

ACZ Sample ID: **L84985-14**

Date Sampled: 10/15/10 08:03

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	27.9			mg/L	0.5	3	10/27/10 3:25	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: ESP-3

ACZ Sample ID: **L84985-15**

Date Sampled: 10/15/10 08:55

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	35.2			mg/L	0.5	3	10/27/10 3:46	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: ESP-1

ACZ Sample ID: **L84985-16**

Date Sampled: 10/15/10 09:43

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	291		*	mg/L	2	8	10/27/10 4:07	ccp

Arizona license number: AZ0102



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: ESP-4

ACZ Sample ID: **L84985-17**

Date Sampled: 10/15/10 10:40

Date Received: 10/20/10

Sample Matrix: Ground Water

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	539		*	mg/L	5	30	10/27/10 4:28	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: DUP20101015A

ACZ Sample ID: **L84985-18**

Date Sampled: 10/15/10 00:00

Date Received: 10/20/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	27.8			mg/L	0.5	3	10/27/10 4:49	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: **L84985**

Project ID: ZS02JH

**Sulfate**

## M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG291421</b>													
WG291421ICV	ICV	10/13/10 14:39	WI101001-1	50		50.82	mg/L	101.6	90	110			
WG291421ICB	ICB	10/13/10 15:00				U	mg/L		-1.5	1.5			
<b>WG292086</b>													
WG292086LFB	LFB	10/26/10 18:58	WI100817-1	30		29.59	mg/L	98.6	90	110			
L84965-05DUP	DUP	10/26/10 19:40			47.9	47.78	mg/L				0.3	20	
L84985-09DUP	DUP	10/27/10 0:36			48.5	48.35	mg/L				0.3	20	
L84985-10AS	AS	10/27/10 1:18	WI100817-1	30	52.5	81.18	mg/L	95.6	90	110			
L84965-06AS	AS	10/27/10 11:32	WI100817-1	300	134	436.4	mg/L	100.8	90	110			
<b>WG292173</b>													
WG292173ICV	ICV	10/27/10 15:45	WI101001-1	50		50.56	mg/L	101.1	90	110			
WG292173ICB	ICB	10/27/10 16:07				U	mg/L		-1.5	1.5			
WG292173LFB	LFB	10/27/10 16:28	WI100817-1	30		29.89	mg/L	99.6	90	110			
L84965-12AS	AS	10/27/10 17:52	WI100817-1	30	28.5	57.42	mg/L	96.4	90	110			
L84965-08DUP	DUP	10/28/10 10:24			109	108.5	mg/L				0.5	20	

**FMI Gold & Copper - Sierrita**ACZ Project ID: **L84985**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L84985-07	WG292086	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.
L84985-16	WG292086	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.
L84985-17	WG292086	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.



**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L84985**

No certification qualifiers associated with this analysis

**FMI Gold & Copper - Sierrita**  
 ZS02JH

ACZ Project ID: L84985  
 Date Received: 10/20/2010 10:55  
 Received By: gac  
 Date Printed: 10/21/2010

**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)
2821		3.7	14

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

**Notes**

**FMI Gold & Copper - Sierrita**  
ZS02JH

ACZ Project ID: L84985  
Date Received: 10/20/2010 10:55  
Received By: gac  
Date Printed: 10/21/2010

**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
L84985-01	TMM-1									X		<input type="checkbox"/>
L84985-02	MO-2007-4A									X		<input type="checkbox"/>
L84985-03	MO-2007-4B									X		<input type="checkbox"/>
L84985-04	MO-2007-4C									X		<input type="checkbox"/>
L84985-05	MO-2007-1A									X		<input type="checkbox"/>
L84985-06	MO-2007-1B									X		<input type="checkbox"/>
L84985-07	MO-2007-1C									X		<input type="checkbox"/>
L84985-08	DUP20101013A									X		<input type="checkbox"/>
L84985-09	CW-10									X		<input type="checkbox"/>
L84985-10	CW-6									X		<input type="checkbox"/>
L84985-11	CW-9									X		<input type="checkbox"/>
L84985-12	GV-1									X		<input type="checkbox"/>
L84985-13	GV-2									X		<input type="checkbox"/>
L84985-14	ESP-2									X		<input type="checkbox"/>
L84985-15	ESP-3									X		<input type="checkbox"/>
L84985-16	ESP-1									X		<input type="checkbox"/>
L84985-17	ESP-4									X		<input type="checkbox"/>
L84985-18	DUP20101015A									X		<input type="checkbox"/>

**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

**ACZ** Laboratories, Inc.

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

If yes, please include state forms. Results will be reported to PQL.

## PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

PROJECT INFORMATION				# of Containers	SO4 by EPA 300 or EPA 375							
Quote #:			Matrix									
Project/PO #: ZS02JH												
Reporting state for compliance testing:												
Sampler's Name: Korky Vault												
Are any samples NRC licensable material? Yes No												
SAMPLE IDENTIFICATION		DATE:TIME	Matrix									
TMM-1	10/06/2010 : 09:55	GW	1	X								
MO-2007-4A	10/13/2010 : 10:19	GW	1	X								
MO-2007-4B	10/13/2010 : 09:06	GW	1	X								
MO-2007-4C	10/13/2010 : 09:22	GW	1	X								
MO-2007-1A	10/13/2010 : 13:37	GW	1	X								
MO-2007-1B	10/13/2010 : 12:50	GW	1	X								
MO-2007-1C	10/13/2010 : 13:06	GW	1	X								
DUP20101013A	10/13/2010	GW	1	X								
CW-10	10/14/2010 : 08:31	GW	1	X								
CW-6	10/14/2010 : 09:14	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 7670

PAGE 1 OF 2

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

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
<i>KL Harris</i>	10/18/10 1300	<i>UPS</i>	10/18/10 1300
<i>UPS</i>		<i>[Signature]</i>	10-20-10 1055

L84985



Laboratories, Inc.

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

If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #:

Project/PO #: ZS02JH

Reporting state for compliance testing:

Sampler's Name: Korky Vault

Are any samples NRC licensable material? Yes No

SAMPLE IDENTIFICATION

DATE:TIME

Matrix

# of Containers

S04 by EPA 300 or EPA 375

CW-9

10/14/2010 : 10:08

GW

1

X

GV-1

10/14/2010 : 10:35

GW

1

X

GV-2

10/14/2010 : 11:20

GW

1

X

ESP-2

10/15/2010 : 08:03

GW

1

X

ESP-3

10/15/2010 : 08:55

GW

1

X

ESP-1

10/15/2010 : 09:43

GW

1

X

ESP-4

10/15/2010 : 10:40

GW

1

X

DUP20101015A

10/15/2010

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 7670

PAGE 2 OF 2

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

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

KR Daigneau  
UPS

10/18/10 1300

UPS  
[Signature]

10/18/10 1300  
10-20-10 1055

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

November 09, 2010

**Cc: Ben Daigneau**

Project ID: ZS02JH  
ACZ Project ID: L85034- **SULFATE ONLY**

Korky Vault:

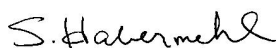
Enclosed are analytical reports for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 22, 2010. This project was assigned to ACZ's project number, L85034. Please reference this number in all future inquiries.

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 L85034. 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.



Scott Habermehl has reviewed  
and approved this report.





**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: M-8

ACZ Sample ID: **L85034-01**

Date Sampled: 10/21/10 11:57

Date Received: 10/22/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	46.9			mg/L	0.5	3	10/28/10 13:13	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: M-10

ACZ Sample ID: **L85034-02**

Date Sampled: 10/21/10 09:39

Date Received: 10/22/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	139		*	mg/L	2	8	10/28/10 13:56	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: **L85034**

Project ID: ZS02JH

**Calcium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	100		101.87	mg/L	101.9	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.6	0.6			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	67.98099		72.58	mg/L	106.8	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	67.98099	370	414.2	mg/L	65	85	115			M3
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	67.98099	370	411.07	mg/L	60.4	85	115	0.76	20	M3

**Conductivity @25C**

SM2510B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292380</b>													
WG292380LCSW1	LCSW	10/29/10 11:35	PCN35393	1408.8		1476	µmhos/cm	104.8	90	110			
WG292380LCSW4	LCSW	10/29/10 14:53	PCN35393	1408.8		1412	µmhos/cm	100.2	90	110			
L85042-02DUP	DUP	10/29/10 16:42			301	302	µmhos/cm				0.3	20	
WG292380LCSW7	LCSW	10/29/10 18:23	PCN35393	1408.8		1391	µmhos/cm	98.7	90	110			
WG292380LCSW10	LCSW	10/29/10 21:44	PCN35393	1408.8		1359	µmhos/cm	96.5	90	110			
WG292380LCSW13	LCSW	10/30/10 0:43	PCN35393	1408.8		1322	µmhos/cm	93.8	90	110			

**Copper, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	2		1.892	mg/L	94.6	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.03	0.03			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	.5		.513	mg/L	102.6	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	.5	U	.526	mg/L	105.2	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	.5	U	.519	mg/L	103.8	85	115	1.34	20	

**Iron, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	2		1.94	mg/L	97	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.06	0.06			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	1		1.043	mg/L	104.3	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	1	U	1.075	mg/L	107.5	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	1	U	1.073	mg/L	107.3	85	115	0.19	20	

**Magnesium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	100		103.34	mg/L	103.3	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.6	0.6			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	49.99941		53.06	mg/L	106.1	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	49.99941	14.2	67.52	mg/L	106.6	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	49.99941	14.2	69.18	mg/L	110	85	115	2.43	20	

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85034**

Project ID: ZS02JH

**Manganese, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	2		1.95	mg/L	97.5	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.015	0.015			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	.5		.5342	mg/L	106.8	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	.5	.657	1.1975	mg/L	108.1	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	.5	.657	1.1972	mg/L	108	85	115	0.03	20	

**pH (lab)**

M150.1 - Electrometric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292380</b>													
WG292380LCSW3	LCSW	10/29/10 11:50	PCN34991	6		6.07	units	101.2	98	102			
WG292380LCSW6	LCSW	10/29/10 15:09	PCN34991	6		6.06	units	101	98	102			
L85042-02DUP	DUP	10/29/10 16:42			8.5	8.51	units				0.1	20	
WG292380LCSW9	LCSW	10/29/10 18:38	PCN34991	6		6.05	units	100.8	98	102			
WG292380LCSW12	LCSW	10/29/10 21:59	PCN34991	6		6.04	units	100.7	98	102			
WG292380LCSW15	LCSW	10/30/10 0:59	PCN34991	6		6.04	units	100.7	98	102			

**Sulfate**

M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292173</b>													
WG292173ICV	ICV	10/27/10 15:45	WI101001-1	50		50.56	mg/L	101.1	90	110			
WG292173ICB	ICB	10/27/10 16:07				U	mg/L		-1.5	1.5			
<b>WG292265</b>													
WG292265LFB	LFB	10/28/10 12:10	WI100817-1	30		29.82	mg/L	99.4	90	110			
L84724-03DUP	DUP	10/28/10 12:52			1180	1185	mg/L				0.4	20	
L85034-01AS	AS	10/28/10 13:34	WI100817-1	30	46.9	75.15	mg/L	94.2	90	110			

**Zinc, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	2		1.988	mg/L	99.4	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.03	0.03			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	.5		.525	mg/L	105	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	.5	.04	.575	mg/L	107	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	.5	.04	.594	mg/L	110.8	85	115	3.25	20	

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85034**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L85034-02	WG292265	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.



**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85034**

No certification qualifiers associated with this analysis

**FMI Gold & Copper - Sierrita**  
ZS02JH

ACZ Project ID: L85034  
Date Received: 10/22/2010 10:07  
Received By: gac  
Date Printed: 10/25/2010

**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)
2879	4.6	13

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

**Notes**

Cross out Line 2.

**FMI Gold & Copper - Sierrita**  
 ZS02JH

ACZ Project ID: L85034  
 Date Received: 10/22/2010 10:07  
 Received By: gac  
 Date Printed: 10/25/2010

**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
L85034-01	M-8									X		<input type="checkbox"/>
L85034-02	M-10		Y									<input type="checkbox"/>

**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: \_\_\_\_\_

685033 WP 10.15.10 LPL 10.15.10 685034



Laboratories, Inc.

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

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

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

ANALYSES REQUESTED (attach list or use quote number)

Quote #:  
Project/PO #: ZS02JH  
Reporting state for compliance testing:  
Sampler's Name: Korky Vault  
Are any samples NRC licensable material? Yes No

# of Containers

SO4 by EPA 300 or EPA 375

TB-Semi

SAMPLE IDENTIFICATION

DATE:TIME

Matrix

M-8 10/21/2010 : 1157 GW 1 X

M-10 10/21/2010 : 09:30 9 GW 3 X

KR

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 7689

For sample M-10, send sulfate results only to Ben Daigneau.

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

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

KR

10/21/2010 : 1400

UPS

10/21/2010 : 1400

10-22-10 1007

November 02, 2010

## Report to:

Korky Vault

FMI Gold &amp; Copper - Sierrita

6200 W. Duval Mine Rd.

Green Valley, AZ 85614

## Bill to:

Accounts Payable

FMI Gold &amp; Copper - Sierrita

P.O. Box 2671

Phoenix, AZ 85002-2671

cc: Ben Daigneau

Project ID: ZS02JH

ACZ Project ID: L85034

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 22, 2010. This project has been assigned to ACZ's project number, L85034. 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 L85034. 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 December 02, 2010. 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.



Scott Habermehl has reviewed  
and approved this report.



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: M-8

ACZ Sample ID: **L85034-01**

Date Sampled: 10/21/10 11:57

Date Received: 10/22/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	46.9			mg/L	0.5	3	10/28/10 13:13	ccp

**Arizona license number: AZ0102**



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: M-10

ACZ Sample ID: **L85034-02**

Date Sampled: 10/21/10 09:39

Date Received: 10/22/10

Sample Matrix: Ground Water

## Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	49.9		*	mg/L	0.2	1	10/28/10 21:23	ear
Copper, dissolved	M200.7 ICP		U		mg/L	0.01	0.05	10/28/10 21:23	ear
Iron, dissolved	M200.7 ICP	0.03	B		mg/L	0.02	0.05	10/28/10 21:23	ear
Magnesium, dissolved	M200.7 ICP	10.7			mg/L	0.2	1	10/28/10 21:23	ear
Manganese, dissolved	M200.7 ICP	0.021	B		mg/L	0.005	0.03	10/28/10 21:23	ear
Zinc, dissolved	M200.7 ICP	0.14			mg/L	0.01	0.05	10/28/10 21:23	ear

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Conductivity @25C	SM2510B	608			umhos/cm	1	10	10/29/10 15:13	jjc
pH (lab)	SM4500H+ B								
pH		8.2	H		units	0.1	0.1	10/29/10 0:00	jjc
pH measured at		22.0			C	0.1	0.1	10/29/10 0:00	jjc
Sulfate	M300.0 - Ion Chromatography	139		*	mg/L	2	8	10/28/10 13:56	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: **L85034**

Project ID: ZS02JH

**Calcium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	100		101.87	mg/L	101.9	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.6	0.6			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	67.98099		72.58	mg/L	106.8	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	67.98099	370	414.2	mg/L	65	85	115			M3
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	67.98099	370	411.07	mg/L	60.4	85	115	0.76	20	M3

**Conductivity @25C**

SM2510B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292380</b>													
WG292380LCSW1	LCSW	10/29/10 11:35	PCN35393	1408.8		1476	µmhos/cm	104.8	90	110			
WG292380LCSW4	LCSW	10/29/10 14:53	PCN35393	1408.8		1412	µmhos/cm	100.2	90	110			
L85042-02DUP	DUP	10/29/10 16:42			301	302	µmhos/cm				0.3	20	
WG292380LCSW7	LCSW	10/29/10 18:23	PCN35393	1408.8		1391	µmhos/cm	98.7	90	110			
WG292380LCSW10	LCSW	10/29/10 21:44	PCN35393	1408.8		1359	µmhos/cm	96.5	90	110			
WG292380LCSW13	LCSW	10/30/10 0:43	PCN35393	1408.8		1322	µmhos/cm	93.8	90	110			

**Copper, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	2		1.892	mg/L	94.6	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.03	0.03			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	.5		.513	mg/L	102.6	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	.5	U	.526	mg/L	105.2	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	.5	U	.519	mg/L	103.8	85	115	1.34	20	

**Iron, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	2		1.94	mg/L	97	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.06	0.06			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	1		1.043	mg/L	104.3	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	1	U	1.075	mg/L	107.5	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	1	U	1.073	mg/L	107.3	85	115	0.19	20	

**Magnesium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	100		103.34	mg/L	103.3	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.6	0.6			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	49.99941		53.06	mg/L	106.1	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	49.99941	14.2	67.52	mg/L	106.6	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	49.99941	14.2	69.18	mg/L	110	85	115	2.43	20	

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85034**

Project ID: ZS02JH

**Manganese, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	2		1.95	mg/L	97.5	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.015	0.015			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	.5		.5342	mg/L	106.8	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	.5	.657	1.1975	mg/L	108.1	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	.5	.657	1.1972	mg/L	108	85	115	0.03	20	

**pH (lab)**

M150.1 - Electrometric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292380</b>													
WG292380LCSW3	LCSW	10/29/10 11:50	PCN34991	6		6.07	units	101.2	98	102			
WG292380LCSW6	LCSW	10/29/10 15:09	PCN34991	6		6.06	units	101	98	102			
L85042-02DUP	DUP	10/29/10 16:42			8.5	8.51	units				0.1	20	
WG292380LCSW9	LCSW	10/29/10 18:38	PCN34991	6		6.05	units	100.8	98	102			
WG292380LCSW12	LCSW	10/29/10 21:59	PCN34991	6		6.04	units	100.7	98	102			
WG292380LCSW15	LCSW	10/30/10 0:59	PCN34991	6		6.04	units	100.7	98	102			

**Sulfate**

M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292173</b>													
WG292173ICV	ICV	10/27/10 15:45	WI101001-1	50		50.56	mg/L	101.1	90	110			
WG292173ICB	ICB	10/27/10 16:07				U	mg/L		-1.5	1.5			
<b>WG292265</b>													
WG292265LFB	LFB	10/28/10 12:10	WI100817-1	30		29.82	mg/L	99.4	90	110			
L84724-03DUP	DUP	10/28/10 12:52			1180	1185	mg/L				0.4	20	
L85034-01AS	AS	10/28/10 13:34	WI100817-1	30	46.9	75.15	mg/L	94.2	90	110			

**Zinc, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292323</b>													
WG292323ICV	ICV	10/28/10 19:48	II101015-1	2		1.988	mg/L	99.4	95	105			
WG292323ICB	ICB	10/28/10 19:52				U	mg/L		-0.03	0.03			
WG292323LFB	LFB	10/28/10 20:04	II101021-2	.5		.525	mg/L	105	85	115			
L85017-03AS	AS	10/28/10 21:05	II101021-2	.5	.04	.575	mg/L	107	85	115			
L85017-03ASD	ASD	10/28/10 21:08	II101021-2	.5	.04	.594	mg/L	110.8	85	115	3.25	20	

**FMI Gold & Copper - Sierrita**ACZ Project ID: **L85034**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L85034-02	WG292323	Calcium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG292265	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85034**

No certification qualifiers associated with this analysis



**FMI Gold & Copper - Sierrita**  
ZS02JH

ACZ Project ID: L85034  
Date Received: 10/22/2010 10:07  
Received By: gac  
Date Printed: 10/25/2010

**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)
2879	4.6	13

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

**Notes**

Cross out Line 2.

**FMI Gold & Copper - Sierrita**  
 ZS02JH

ACZ Project ID: L85034  
 Date Received: 10/22/2010 10:07  
 Received By: gac  
 Date Printed: 10/25/2010

**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
L85034-01	M-8									X		<input type="checkbox"/>
L85034-02	M-10		Y									<input type="checkbox"/>

**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: \_\_\_\_\_



November 09, 2010

## 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: ZS02JH

ACZ Project ID: L85112

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 29, 2010. This project has been assigned to ACZ's project number, L85112. 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 L85112. 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 December 09, 2010. 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.



Scott Habermehl has reviewed  
and approved this report.



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: CW-3

ACZ Sample ID: **L85112-01**

Date Sampled: 10/25/10 12:11

Date Received: 10/29/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	57.6			mg/L	0.5	3	11/03/10 20:23	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: NP-2

ACZ Sample ID: **L85112-02**

Date Sampled: 10/25/10 13:28

Date Received: 10/29/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	41.4			mg/L	0.5	3	11/03/10 21:05	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-3B

ACZ Sample ID: **L85112-03**

Date Sampled: 10/26/10 09:54

Date Received: 10/29/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	39.1			mg/L	0.5	3	11/03/10 21:48	ccp

Arizona license number: AZ0102



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-3C

ACZ Sample ID: **L85112-04**

Date Sampled: 10/26/10 10:24

Date Received: 10/29/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	104		*	mg/L	3	10	11/03/10 22:09	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-6A

ACZ Sample ID: **L85112-05**

Date Sampled: 10/26/10 12:06

Date Received: 10/29/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	33.9			mg/L	0.5	3	11/03/10 22:30	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-6B

ACZ Sample ID: **L85112-06**

Date Sampled: 10/26/10 12:58

Date Received: 10/29/10

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	57.7			mg/L	0.5	3	11/03/10 22:51	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: **L85112**

Project ID: ZS02JH

**Sulfate**

M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292173</b>													
WG292173 CV	ICV	10/27/10 15:45	WI101001-1	50		50.56	mg/L	101.1	90	110			
WG292173 CB	ICB	10/27/10 16:07				U	mg/L		-1.5	1.5			
<b>WG292639</b>													
WG292639 LFB	LFB	11/03/10 20:02	WI100817-1	30		29.85	mg/L	99.5	90	110			
L85112-01 DUP	DUP	11/03/10 20:44			57.6	57.54	mg/L				0.1	20	
L85112-02 AS	AS	11/03/10 21:26	WI100817-1	30	41.4	70.3	mg/L	96.3	90	110			

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85112**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L85112-04	WG292639	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85112**

No certification qualifiers associated with this analysis

**FMI Gold & Copper - Sierrita**  
ZS02JH

ACZ Project ID: L85112  
Date Received: 10/29/2010 10:55  
Received By: gac  
Date Printed: 10/29/2010

**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)
2943		3.9	15

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

**Notes**



**FMI Gold & Copper - Sierrita**  
 ZS02JH

ACZ Project ID: L85112  
 Date Received: 10/29/2010 10:55  
 Received By: gac  
 Date Printed: 10/29/2010

**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
L85112-01	CW-3									X		<input type="checkbox"/>
L85112-02	NP-2									X		<input type="checkbox"/>
L85112-03	MO-2007-3B									X		<input type="checkbox"/>
L85112-04	MO-2007-3C									X		<input type="checkbox"/>
L85112-05	MO-2007-6A									X		<input type="checkbox"/>
L85112-06	MO-2007-6B									X		<input type="checkbox"/>

**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

L85112

# ACZ Laboratories, Inc.

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

## 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

### 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

If yes, please include state forms. Results will be reported to PQL.

### PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #:

Project/PO #: ZS02JH

Reporting state for compliance testing:

Sampler's Name: Korky Vault

Are any samples NRC licensable material? Yes No

SAMPLE IDENTIFICATION DATE: TIME Matrix

CW-3 10/25/2010 : 1211 GW 1

NP-2 10/25/2010 : 1328 GW 1

MO-2007-3B 10/26/2010 : 0954 GW 1

MO-2007-3C 10/26/2010 : 1024 GW 1

MO-2007-6A 10/26/2010 : 1206 GW 1

MO-2007-6B 10/26/2010 : 1258 GW 1

# of Containers

SO4 by EPA 300 or EPA 375

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 7698

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

RELINQUISHED BY:

DATE: TIME

RECEIVED BY:

DATE: TIME

UPS

10/28/2010 : 1000

UPS

10/28/2010 : 1000

10-29-10 1055

November 16, 2010

## Report to:

Korky Vault

FMI Gold &amp; Copper - Sierrita

6200 W. Duval Mine Rd.

Green Valley, AZ 85614

## Bill to:

Accounts Payable

FMI Gold &amp; Copper - Sierrita

P.O. Box 2671

Phoenix, AZ 85002-2671

cc: Ben Daigneau

Project ID: ZS02JH

ACZ Project ID: L85209

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on November 04, 2010. This project has been assigned to ACZ's project number, L85209. 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 L85209. 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 December 16, 2010. 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.



Scott Habermehl has reviewed  
and approved this report.



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-1B

ACZ Sample ID: **L85209-01**

Date Sampled: 10/13/10 12:50

Date Received: 11/04/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	337		*	mg/L	3	10	11/08/10 16:10	ccp

**Note: This report is for the re-analysis of the sample previously reported as ACZ project L84985-06.****Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-1C

ACZ Sample ID: **L85209-02**

Date Sampled: 10/13/10 13:06

Date Received: 11/04/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	377		*	mg/L	5	30	11/08/10 16:53	ccp

**Note: This report is for the re-analysis of the sample previously reported as ACZ project L84985-07.****Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: ESP-1

ACZ Sample ID: **L85209-03**

Date Sampled: 10/15/10 09:43

Date Received: 11/04/10

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	291		*	mg/L	2	8	11/09/10 19:50	ccp

**Note: This report is for the re-analysis of the sample previously reported as ACZ project L84985-16.****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: **L85209**

Project ID: ZS02JH

**Sulfate**

## M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292173</b>													
WG292173ICV	ICV	10/27/10 15:45	WI101001-1	50		50.56	mg/L	101.1	90	110			
WG292173ICB	ICB	10/27/10 16:07				U	mg/L		-1.5	1.5			
<b>WG292903</b>													
WG292903LFB	LFB	11/08/10 15:49	WI100817-1	30		29.17	mg/L	97.2	90	110			
L85209-01DUP	DUP	11/08/10 16:31			337	339.7	mg/L				0.8	20	
L85209-02AS	AS	11/08/10 17:14	WI100817-1	300	377	670	mg/L	97.7	90	110			
<b>WG292954</b>													
WG292954LFB	LFB	11/09/10 19:29	WI100817-1	30		29.36	mg/L	97.9	90	110			
L85209-03DUP	DUP	11/09/10 20:12			291	285.5	mg/L				1.9	20	
L85219-01AS	AS	11/10/10 16:00	WI100817-1	300	296	594.1	mg/L	99.4	90	110			



**FMI Gold & Copper - Sierrita**ACZ Project ID: **L85209**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L85209-01	WG292903	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.
L85209-02	WG292903	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.
L85209-03	WG292954	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85209**

No certification qualifiers associated with this analysis

**FMI Gold & Copper - Sierrita**  
ZS02JH

ACZ Project ID: L84985  
Date Received: 10/20/2010 10:55  
Received By: gac  
Date Printed: 10/21/2010

**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)
2821		3.7	14

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

**Notes**

**FMI Gold & Copper - Sierrita**  
ZS02JH

ACZ Project ID: L84985  
Date Received: 10/20/2010 10:55  
Received By: gac  
Date Printed: 10/21/2010

**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
L84985-01	TMM-1									X		<input type="checkbox"/>
L84985-02	MO-2007-4A									X		<input type="checkbox"/>
L84985-03	MO-2007-4B									X		<input type="checkbox"/>
L84985-04	MO-2007-4C									X		<input type="checkbox"/>
L84985-05	MO-2007-1A									X		<input type="checkbox"/>
L84985-06	MO-2007-1B									X		<input type="checkbox"/>
L84985-07	MO-2007-1C									X		<input type="checkbox"/>
L84985-08	DUP20101013A									X		<input type="checkbox"/>
L84985-09	CW-10									X		<input type="checkbox"/>
L84985-10	CW-6									X		<input type="checkbox"/>
L84985-11	CW-9									X		<input type="checkbox"/>
L84985-12	GV-1									X		<input type="checkbox"/>
L84985-13	GV-2									X		<input type="checkbox"/>
L84985-14	ESP-2									X		<input type="checkbox"/>
L84985-15	ESP-3									X		<input type="checkbox"/>
L84985-16	ESP-1									X		<input type="checkbox"/>
L84985-17	ESP-4									X		<input type="checkbox"/>
L84985-18	DUP20101015A									X		<input type="checkbox"/>

**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

~~64985~~ wpl 11-4-10

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

Report to:

Copy of Report to:

Invoice to:

## PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

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 7670

PAGE 1 OF 2

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

FRMAD050.01.15.09

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

~~LG4985~~ WPL 11-4-10

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

December 29, 2010

## 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: ZS02JH

ACZ Project ID: L85886

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 17, 2010. This project has been assigned to ACZ's project number, L85886. 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 L85886. 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 January 29, 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.



Scott Habermehl has reviewed  
and approved this report.



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-5B

ACZ Sample ID: **L85886-01**

Date Sampled: 12/10/10 08:47

Date Received: 12/17/10

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	454		*	mg/L	5	30	12/28/10 12:35	ccp

**Arizona license number: AZ0102**



**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2007-5C

ACZ Sample ID: **L85886-02**

Date Sampled: 12/10/10 13:45

Date Received: 12/17/10

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	251		*	mg/L	5	30	12/28/10 13:17	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: MO-2009-1

ACZ Sample ID: **L85886-03**

Date Sampled: 12/15/10 13:08

Date Received: 12/17/10

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	95		*	mg/L	5	30	12/28/10 13:59	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS02JH

Sample ID: DUP20101215B

ACZ Sample ID: **L85886-04**

Date Sampled: 12/15/10 00:00

Date Received: 12/17/10

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	94		*	mg/L	5	30	12/28/10 14:21	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: **L85886**

Project ID: ZS02JH

**Sulfate**

M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292173</b>													
WG292173 CV	ICV	10/27/10 15:45	WI101001-1	50		50.56	mg/L	101.1	90	110			
WG292173 CB	ICB	10/27/10 16:07				U	mg/L		-1.5	1.5			
<b>WG295260</b>													
WG295260 LFB	LFB	12/28/10 12:14	WI100817-1	30		30.62	mg/L	102.1	90	110			
L85886-01 DUP	DUP	12/28/10 12:56			454	448.8	mg/L				1.2	20	
L85886-02 AS	AS	12/28/10 13:38	WI100817-1	300	251	552.1	mg/L	100.4	90	110			

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85886**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L85886-01	WG295260	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.
L85886-02	WG295260	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.
L85886-03	WG295260	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.
L85886-04	WG295260	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L85886**

No certification qualifiers associated with this analysis

**FMI Gold & Copper - Sierrita**  
 ZS02JH

ACZ Project ID: L85886  
 Date Received: 12/17/2010 10:44  
 Received By: gac  
 Date Printed: 12/17/2010

**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)
Na12185		1.9	21

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

**Notes**



**FMI Gold & Copper - Sierrita**  
 ZS02JH

ACZ Project ID: L85886  
 Date Received: 12/17/2010 10:44  
 Received By: gac  
 Date Printed: 12/17/2010

**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
L85886-01	MO-2007-5B									X		<input type="checkbox"/>
L85886-02	MO-2007-5C									X		<input type="checkbox"/>
L85886-03	MO-2009-1									X		<input type="checkbox"/>
L85886-04	DUP20101215B									X		<input type="checkbox"/>

**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



Laboratories, Inc.

L85886

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

## 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

## 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

If yes, please include state forms. Results will be reported to PQL.

## PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #:

Project/PO #: ZS02JH

Reporting state for compliance testing:

Sampler's Name: Korky Vault

Are any samples NRC licensable material? Yes No

SAMPLE IDENTIFICATION

DATE:TIME

Matrix:

# of Containers

SO4 by EPA 300 or EPA 375

MO-2007-5B

12/10/2010 : 0847

GW

1

X

MO-2007-5C

12/10/2010 : 1345

GW

1

X

MO-2009-1

12/15/2010 : 1308

GW

1

X

DUP20101215B

12/15/2010

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 7750

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

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

UPS

12/16/2010 : 1500

UPS

12/16/2010 : 1500

January 31, 2011

## Report to:

Korky Vault

FMI Gold &amp; Copper - Sierrita

6200 W. Duval Mine Rd.

Green Valley, AZ 85614

## Bill to:

Accounts Payable

FMI Gold &amp; Copper - Sierrita

P.O. Box 2671

Phoenix, AZ 85002-2671

cc: Ben Daigneau

Project ID: ZS03BC

ACZ Project ID: L86296

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on January 21, 2011. This project has been assigned to ACZ's project number, L86296. 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 L86296. 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 February 28, 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.



Scott Habermehl has reviewed  
and approved this report.



**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: MO-2007-3B

ACZ Sample ID: **L86296-01**

Date Sampled: 01/18/11 09:36

Date Received: 01/21/11

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	38.2			mg/L	0.5	3	01/26/11 14:21	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: MO-2007-3C

ACZ Sample ID: **L86296-02**

Date Sampled: 01/18/11 10:24

Date Received: 01/21/11

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	106		*	mg/L	3	10	01/26/11 15:03	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: MO-2007-6A

ACZ Sample ID: **L86296-03**

Date Sampled: 01/18/11 12:20

Date Received: 01/21/11

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	30.2			mg/L	0.5	3	01/26/11 15:24	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: MO-2007-6B

ACZ Sample ID: **L86296-04**

Date Sampled: 01/18/11 13:08

Date Received: 01/21/11

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	58.5			mg/L	0.5	3	01/26/11 15:46	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: MO-2007-4B

ACZ Sample ID: **L86296-05**

Date Sampled: 01/19/11 09:57

Date Received: 01/21/11

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	34.6			mg/L	0.5	3	01/26/11 16:07	ccp

**Arizona license number: AZ0102**



**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: MO-2007-4C

ACZ Sample ID: **L86296-06**

Date Sampled: 01/19/11 10:42

Date Received: 01/21/11

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	87.6			mg/L	0.5	3	01/26/11 17:10	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: MO-2007-4A

ACZ Sample ID: **L86296-07**

Date Sampled: 01/19/11 10:48

Date Received: 01/21/11

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	35.8			mg/L	0.5	3	01/26/11 17:31	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: NP-2

ACZ Sample ID: **L86296-08**

Date Sampled: 01/19/11 13:26

Date Received: 01/21/11

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	41.9			mg/L	0.5	3	01/26/11 17:52	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: GV-1

ACZ Sample ID: **L86296-09**

Date Sampled: 01/20/11 08:10

Date Received: 01/21/11

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	40.0			mg/L	0.5	3	01/26/11 18:13	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: GV-2

ACZ Sample ID: **L86296-10**

Date Sampled: 01/20/11 08:44

Date Received: 01/21/11

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	92.7			mg/L	0.5	3	01/26/11 18:34	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: DUP20110119A

ACZ Sample ID: **L86296-11**

Date Sampled: 01/19/11 00:00

Date Received: 01/21/11

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	01/26/11 19:17	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: **L86296**

Project ID: ZS03BC

**Sulfate**

M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG292173</b>													
WG292173 CV	ICV	10/27/10 15:45	WI101001-1	50		50.56	mg/L	101.1	90	110			
WG292173 CB	ICB	10/27/10 16:07				U	mg/L		-1.5	1.5			
<b>WG296502</b>													
WG296502 LFB	LFB	01/26/11 13:18	WI100817-1	30		31.07	mg/L	103.6	90	110			
L86282-02DUP	DUP	01/26/11 14:00			127	123.8	mg/L				2.6	20	
L86296-01AS	AS	01/26/11 14:42	WI100817-1	30	38.2	67.08	mg/L	96.3	90	110			
L86296-10DUP	DUP	01/26/11 18:56			92.7	92.72	mg/L				0	20	
L86296-11AS	AS	01/26/11 19:38	WI100817-1	30	34.4	63.46	mg/L	96.9	90	110			



**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L86296**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L86296-02	WG296502	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.

**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L86296**

No certification qualifiers associated with this analysis

**FMI Gold & Copper - Sierrita**  
 ZS03BC

ACZ Project ID: L86296  
 Date Received: 01/21/2011 10:49  
 Received By:  
 Date Printed: 1/21/2011

**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)
2078		2.7	16

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

**Notes**

**FMI Gold & Copper - Sierrita**  
ZS03BC

ACZ Project ID: L86296

Date Received: 01/21/2011 10:49

Received By:

Date Printed: 1/21/2011

**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
L86296-01	MO-2007-3B									X		<input type="checkbox"/>
L86296-02	MO-2007-3C									X		<input type="checkbox"/>
L86296-03	MO-2007-6A									X		<input type="checkbox"/>
L86296-04	MO-2007-6B									X		<input type="checkbox"/>
L86296-05	MO-2007-4B									X		<input type="checkbox"/>
L86296-06	MO-2007-4C									X		<input type="checkbox"/>
L86296-07	MO-2007-4A									X		<input type="checkbox"/>
L86296-08	NP-2									X		<input type="checkbox"/>
L86296-09	GV-1									X		<input type="checkbox"/>
L86296-10	GV-2									X		<input type="checkbox"/>
L86296-11	DUP20110119A									X		<input type="checkbox"/>

**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: \_\_\_\_\_



Laboratories, Inc.

L86296

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

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

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

If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #:

Project/PO #: ZS03BC

Reporting state for compliance testing:

Sampler's Name: Korky Vault

Are any samples NRC licensable material? Yes ☐

SAMPLE IDENTIFICATION

DATE/TIME

Matrix

# of Containers

SO4 by EPA 300 or EPA 375

MO-2007-3B

1/18/2011 : 0936

GW

1

X

MO-2007-3C

1/18/2011 : 1024

GW

1

X

MO-2007-6A

1/18/2011 : 1220

GW

1

X

MO-2007-6B

1/18/2011 : 1308

GW

1

X

MO-2007-4B

1/19/2011 : 0957

GW

1

X

MO-2007-4C

1/19/2011 : 1042

GW

1

X

MO-2007-4A

1/19/2011 : 1048

GW

1

X

NP-2

1/19/2011 : 1326

GW

1

X

GV-1

1/20/2011 : 0810

GW

1

X

GV-2

1/20/2011 : 0844

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 8446

PAGE 1 of 2

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. (Korky) Vault

1/20/2011 : 1100

UPS

1/20/2011 : 1100

UPS



# Laboratories, Inc.

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

## 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

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

If yes, please include state forms. Results will be reported to PQL.

### PROJECT INFORMATION

ANA YES (S) REQUIRED (attach list or use quote number)

Quote #:

Project/PO #: ZS03BC

Reporting state for compliance testing:

Sampler's Name: Korky Vault

Are any samples NRC licensable material? Yes ☒

# of Containers

SO4 by EPA 300 or EPA 375

SAMPLE IDENTIFICATION

DATE TIME

Matrix

DUP0110119A

01/19/2011

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 8446

PAGE 2 of 2

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*

1/20/2011 : 1100

UPS

1/20/2011 : 1100

UPS

March 08, 2011

## Report to:

Korky Vault

FMI Gold &amp; Copper - Sierrita

6200 W. Duval Mine Rd.

Green Valley, AZ 85614

## Bill to:

Accounts Payable

FMI Gold &amp; Copper - Sierrita

P.O. Box 2671

Phoenix, AZ 85002-2671

cc: Ben Daigneau, Tim Alvarado

Project ID: ZS03BC

ACZ Project ID: L86739

Korky Vault:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 28, 2011. This project has been assigned to ACZ's project number, L86739. 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 L86739. 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 April 08, 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.



Scott Habermehl has reviewed  
and approved this report.



FMI Gold Copper - Sierrita

March 08, 2011

Project ID: ZS03BC

ACZ Project ID: L86739

**Sample Receipt**

ACZ Laboratories, Inc. (ACZ) received 5 ground water samples from FMI Gold & Copper - Sierrita on February 28, 2011. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L86739. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

Samples were received outside the EPA recommended temperature of 0-6 degrees C.

**Holding Times**

All analyses were performed within EPA recommended holding times.

**Sample Analysis**

These samples were analyzed for inorganic parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The extended qualifier reports may contain footnotes qualifying specific elements due to QC failures.



**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: MO-2009-1

ACZ Sample ID: **L86739-01**

Date Sampled: 02/02/11 10:05

Date Received: 02/28/11

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	92		*	mg/L	1	5	03/02/11 13:47	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: CW-10

ACZ Sample ID: **L86739-02**

Date Sampled: 02/24/11 08:10

Date Received: 02/28/11

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	50.2			mg/L	0.5	3	03/02/11 14:29	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: CW-6

ACZ Sample ID: **L86739-03**

Date Sampled: 02/24/11 08:47

Date Received: 02/28/11

Sample Matrix: Ground Water

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	70.3			mg/L	0.5	3	03/02/11 15:12	ccp

Arizona license number: AZ0102

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: CW-9

ACZ Sample ID: **L86739-04**

Date Sampled: 02/24/11 09:32

Date Received: 02/28/11

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	42.7			mg/L	0.5	3	03/02/11 15:33	ccp

**Arizona license number: AZ0102**

**FMI Gold & Copper - Sierrita**

Project ID: ZS03BC

Sample ID: DUP20110224A

ACZ Sample ID: **L86739-05**

Date Sampled: 02/24/11 00:00

Date Received: 02/28/11

Sample Matrix: *Ground Water*

## Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Sulfate	M300.0 - Ion Chromatography	50.2			mg/L	0.5	3	03/02/11 15:54	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: **L86739**

Project ID: ZS03BC

**Sulfate**

M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG297778</b>													
WG297778ICV	ICV	02/24/11 13:54	WI110217-4	50		50.34	mg/L	100.7	90	110			
WG297778ICB	ICB	02/24/11 14:15				U	mg/L		-1.5	1.5			
<b>WG297923</b>													
WG297923LFB	LFB	03/02/11 13:26	WI110218-1	30		29.98	mg/L	99.9	90	110			
L86739-01DUP	DUP	03/02/11 14:08			92	91.3	mg/L				0.8	20	
L86739-02AS	AS	03/02/11 14:50	WI110218-1	30	50.2	77.94	mg/L	92.5	90	110			

**FMI Gold & Copper - Sierrita**ACZ Project ID: **L86739**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L86739-01	WG297923	Sulfate	M300.0 - Ion Chromatography	D1	Sample required dilution due to matrix.



**FMI Gold & Copper - Sierrita**

ACZ Project ID: **L86739**

No certification qualifiers associated with this analysis

**FMI Gold & Copper - Sierrita**  
ZS03BC

ACZ Project ID: L86739  
Date Received: 02/28/2011 10:49  
Received By: gac  
Date Printed: 2/28/2011

**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)
2513		12.3	15

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

**Notes**

**FMI Gold & Copper - Sierrita**  
 ZS03BC

ACZ Project ID: L86739  
 Date Received: 02/28/2011 10:49  
 Received By: gac  
 Date Printed: 2/28/2011

**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
L86739-01	MO-2009-1									X		<input type="checkbox"/>
L86739-02	CW-10									X		<input type="checkbox"/>
L86739-03	CW-6									X		<input type="checkbox"/>
L86739-04	CW-9									X		<input type="checkbox"/>
L86739-05	DUP20110224A									X		<input type="checkbox"/>

**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



Laboratories, Inc.

L86739

CHAIN of CUSTODY

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

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

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

If yes, please include state forms. Results will be reported to PQL.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #:

Project/PO #: ZS03BC

Reporting state for compliance testing:

Sampler's Name: Korky Vault

Are any samples NRC licensable material? Yes No

# of Containers

SO4 by EPA 300 or EPA 375

SAMPLE IDENTIFICATION

DATE:TIME

Matrix

MO-2009-1

2/2/2011 : 10:05

GW

1

X

CW-10

2/24/2011 : 0810

GW

1

X

CW-6

2/24/2011 : 0847

GW

1

X

CW-9

2/24/2011 : 0932

GW

1

X

DUP20110224A

2/24/2011

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 8428

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

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

UPS

2/24/2011 : 1300

UPS

2/24/2011 : 1300

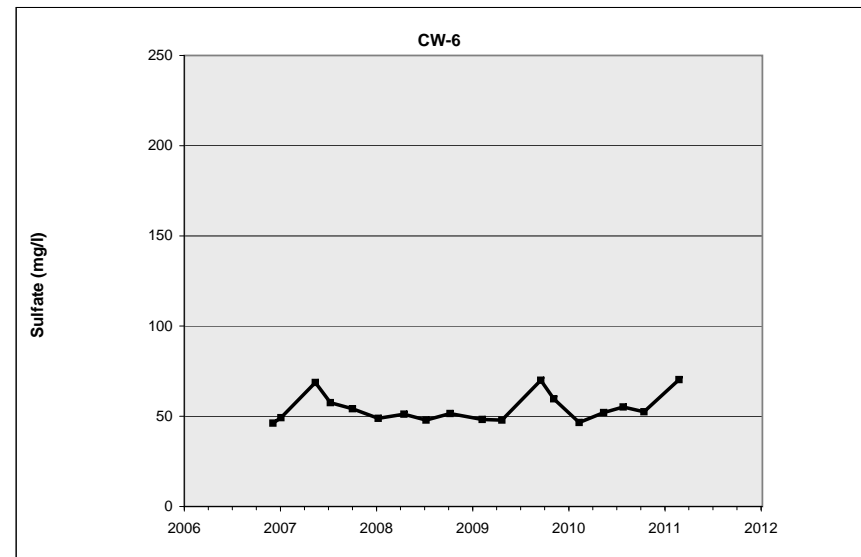
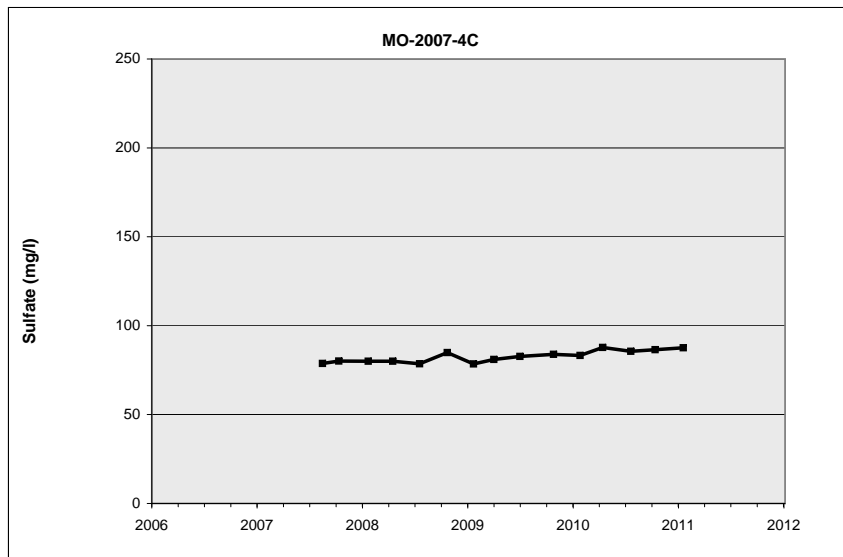
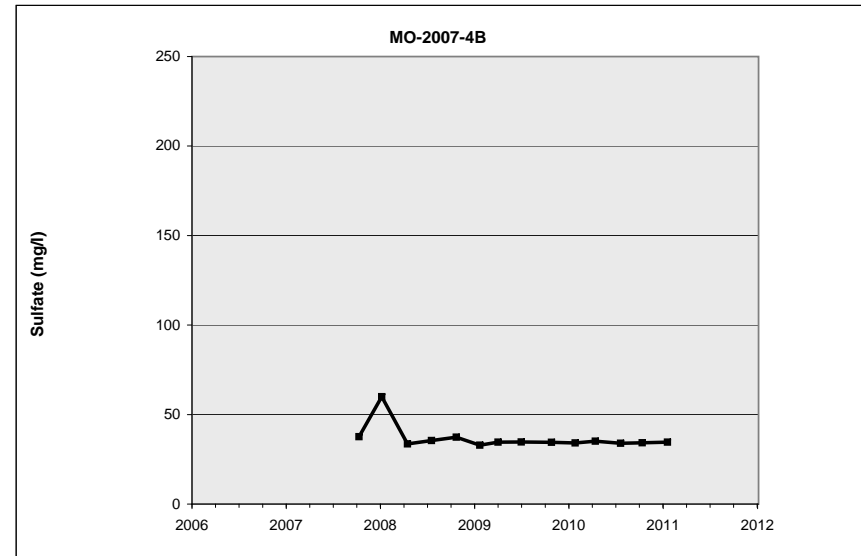
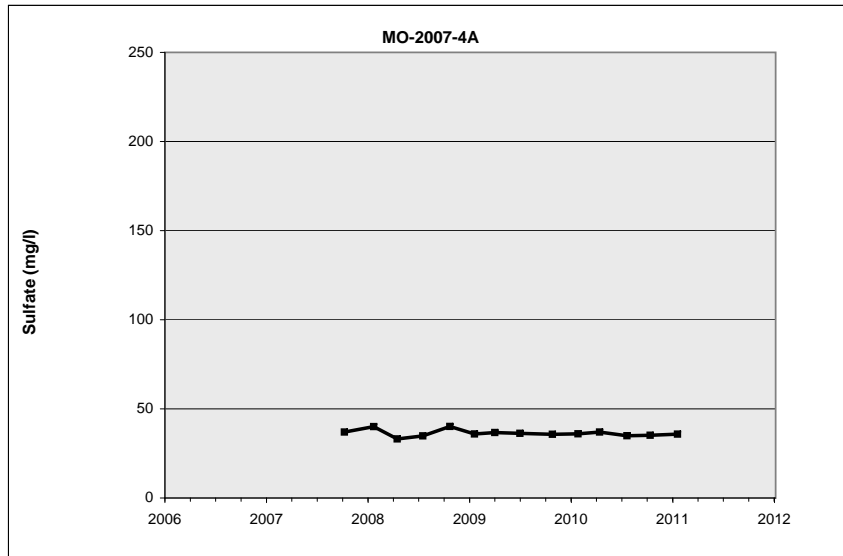
## **APPENDIX C**

### **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
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
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
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
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	10/15/2010 291	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	10/15/2010 27.9	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	10/15/2010 35.2	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
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
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
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	10/13/2010 340	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
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
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
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
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
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
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
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
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
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		04/22/10 41.9	08/05/10 41.2	10/25/10 41.4	01/19/11 41.9

**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**

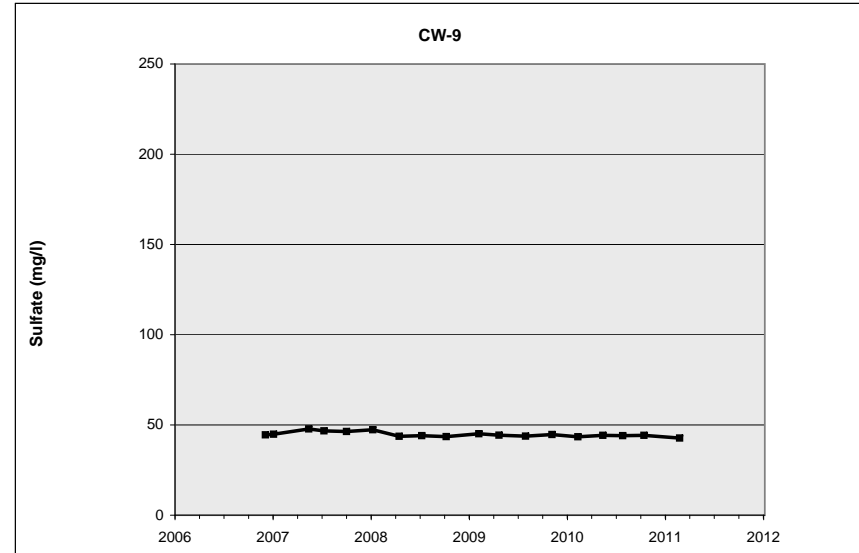
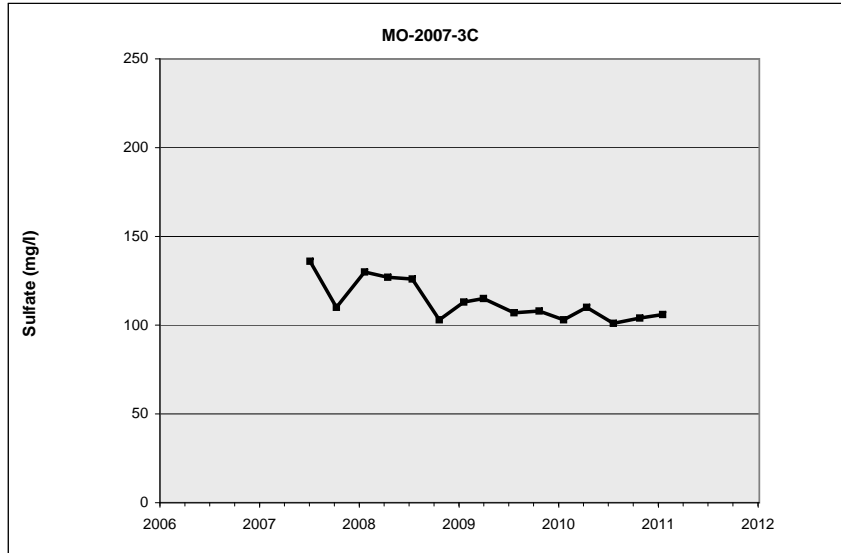
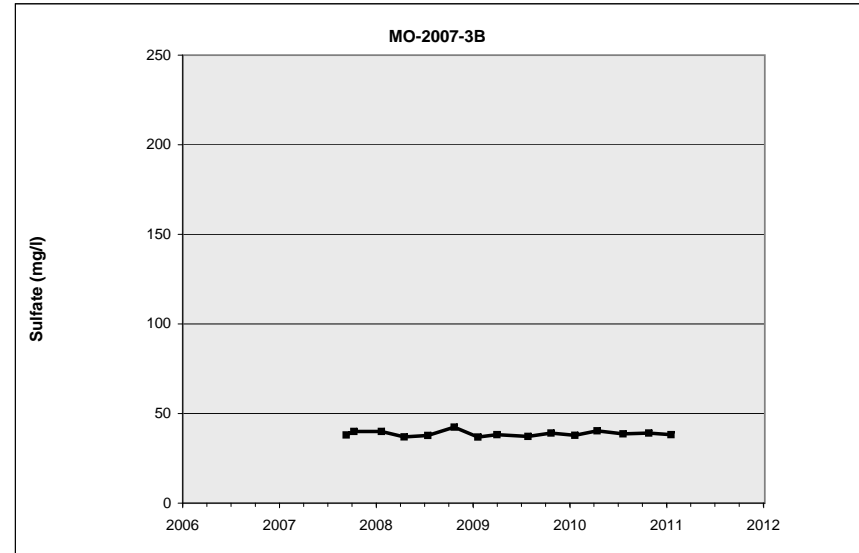
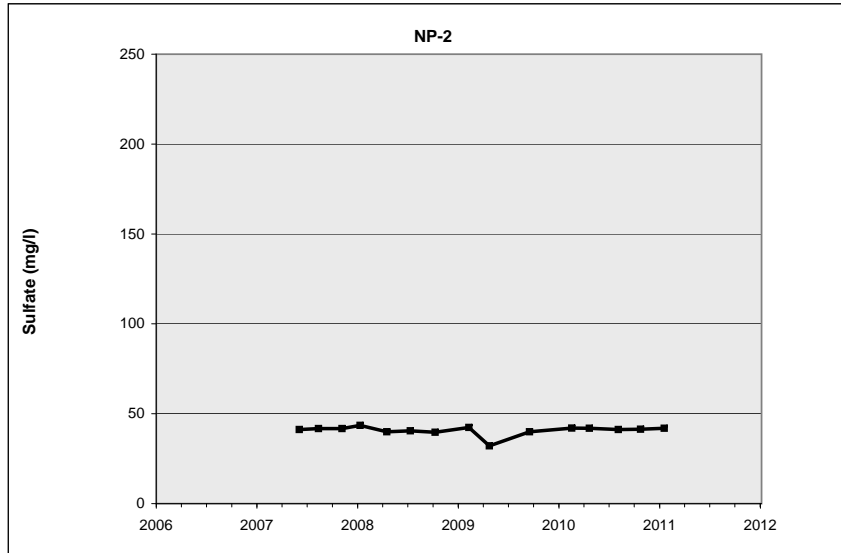
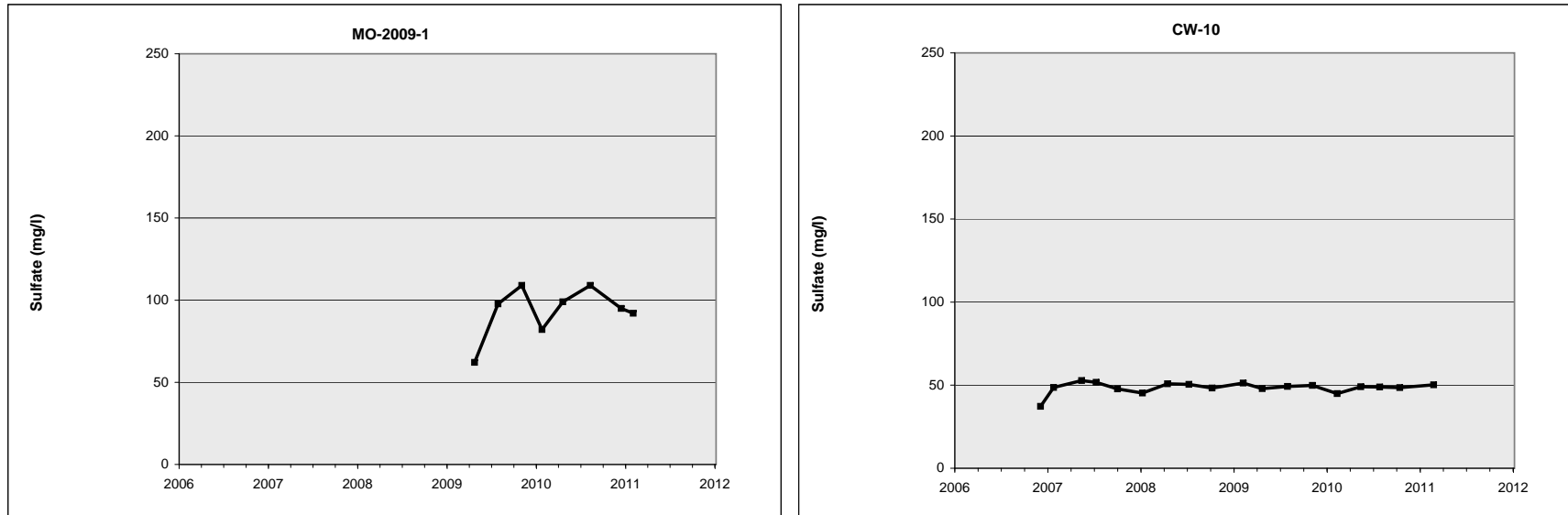
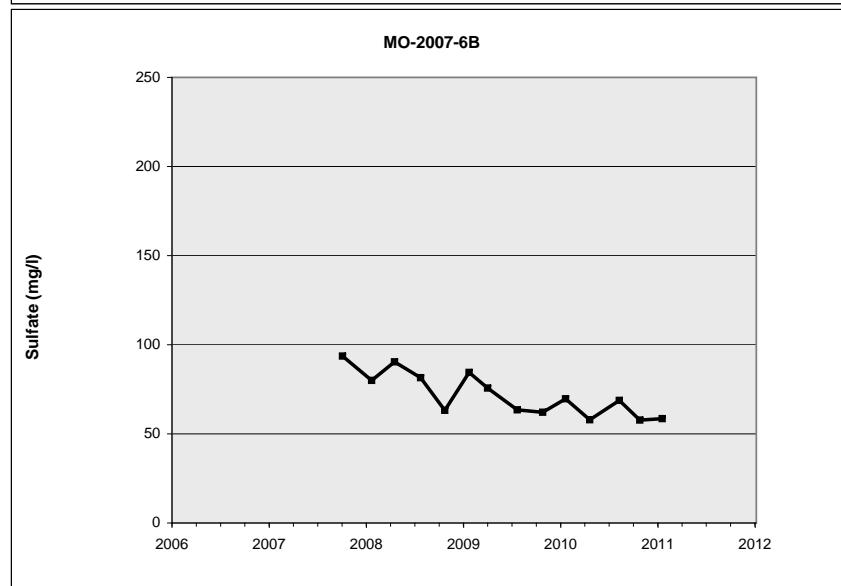
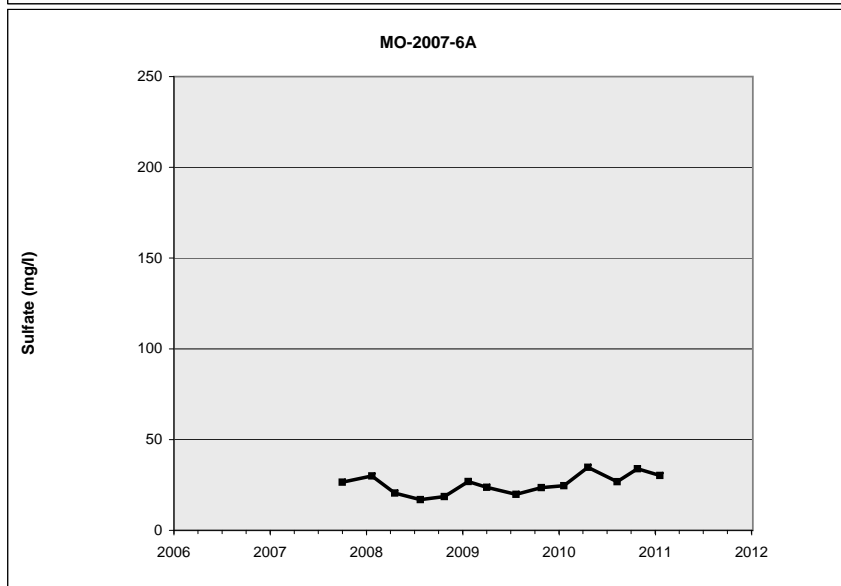
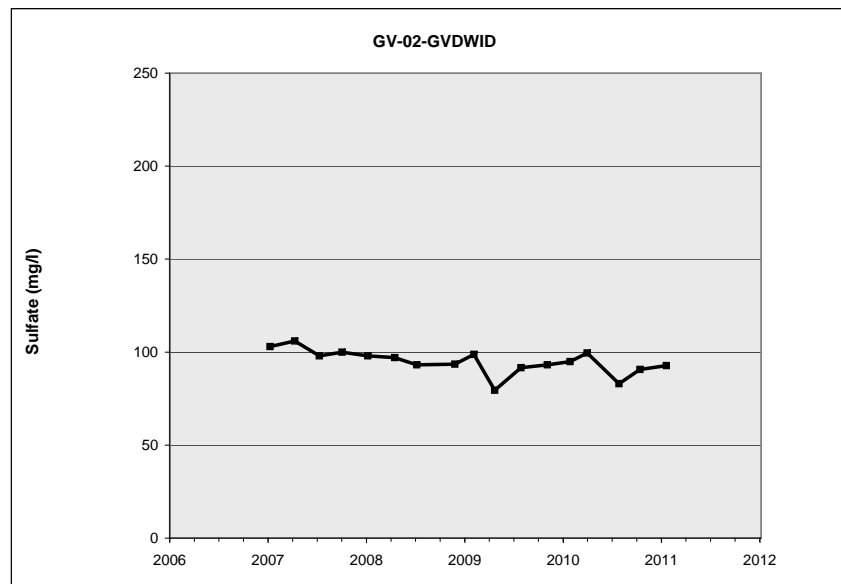
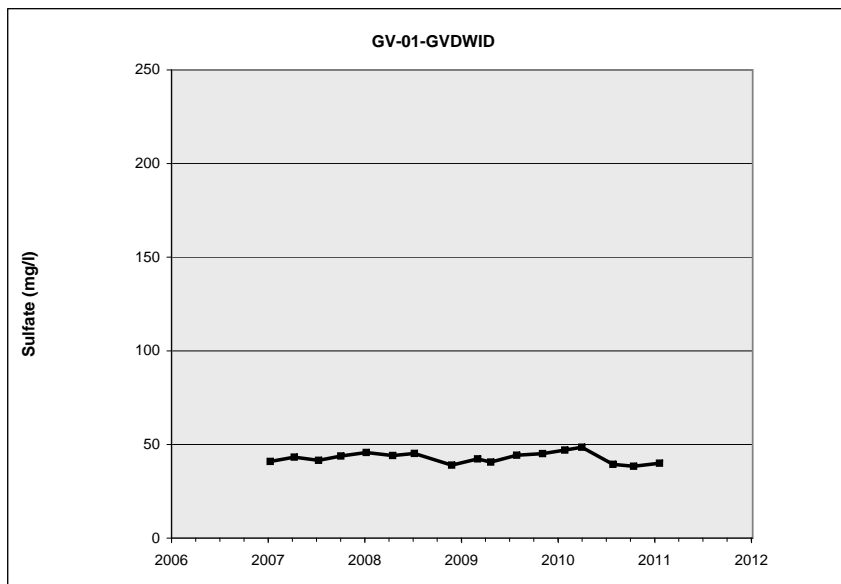




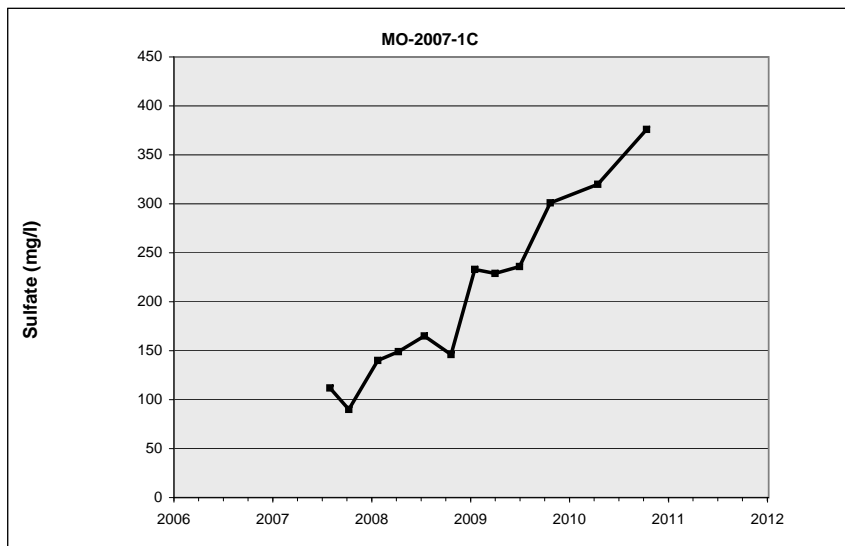
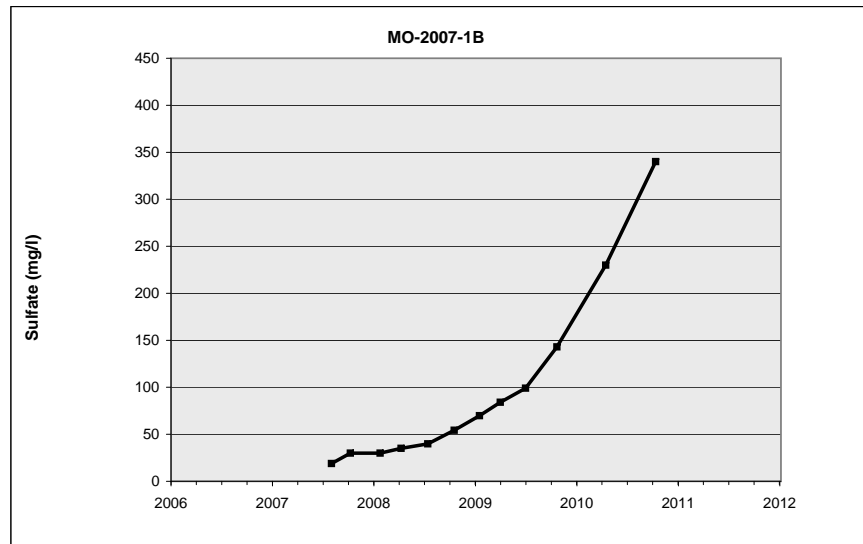
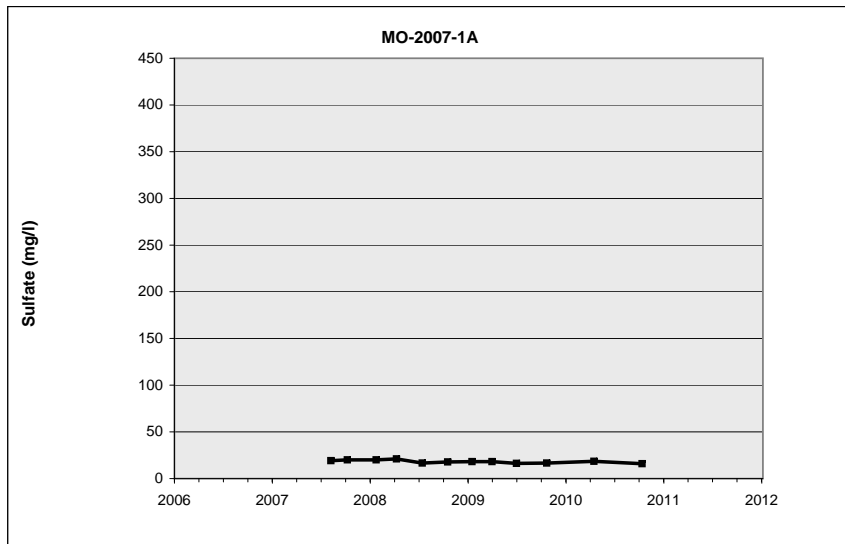
FIGURE C.3  
SULFATE CONCENTRATION OVER TIME FOR WELLS MO-2009-1 AND CW-10



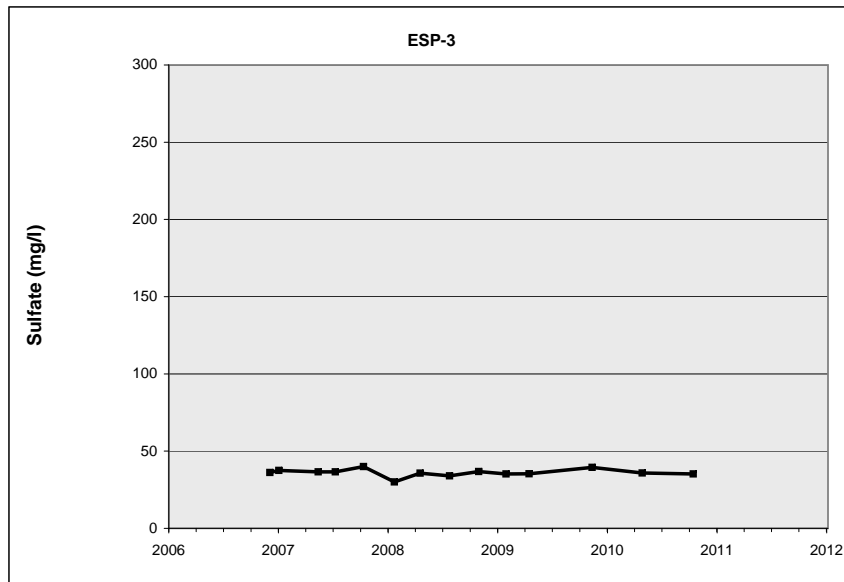
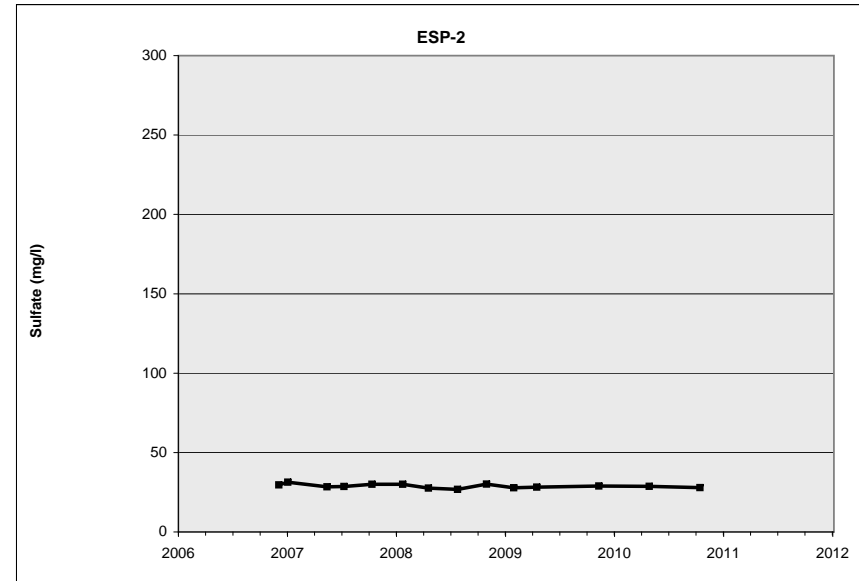
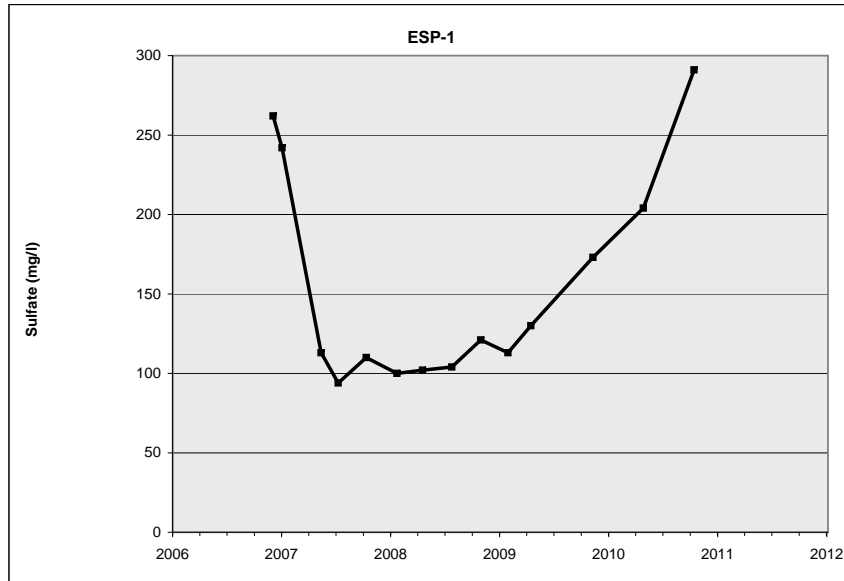
**FIGURE C.4**  
**SULFATE CONCENTRATION OVER TIME FOR WELLS**  
**GV-01-GVDWID, GV-02-GVDWID, MO-2007-6A, AND MO-2007-6B**



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



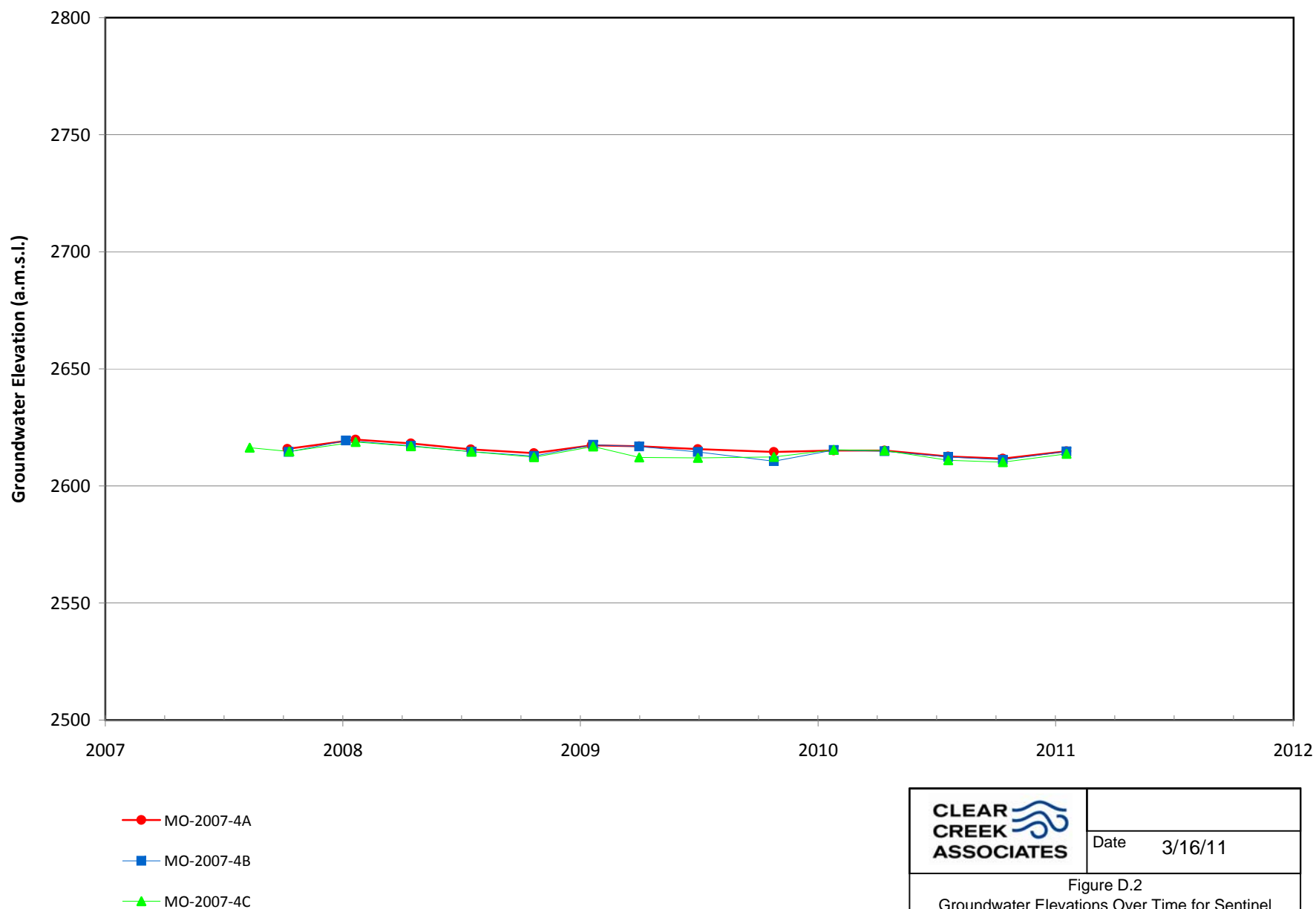
**FIGURE C.6**  
**SULFATE CONCENTRATION OVER TIME FOR WELLS**  
**ESP-1, ESP-2, AND ESP-3**

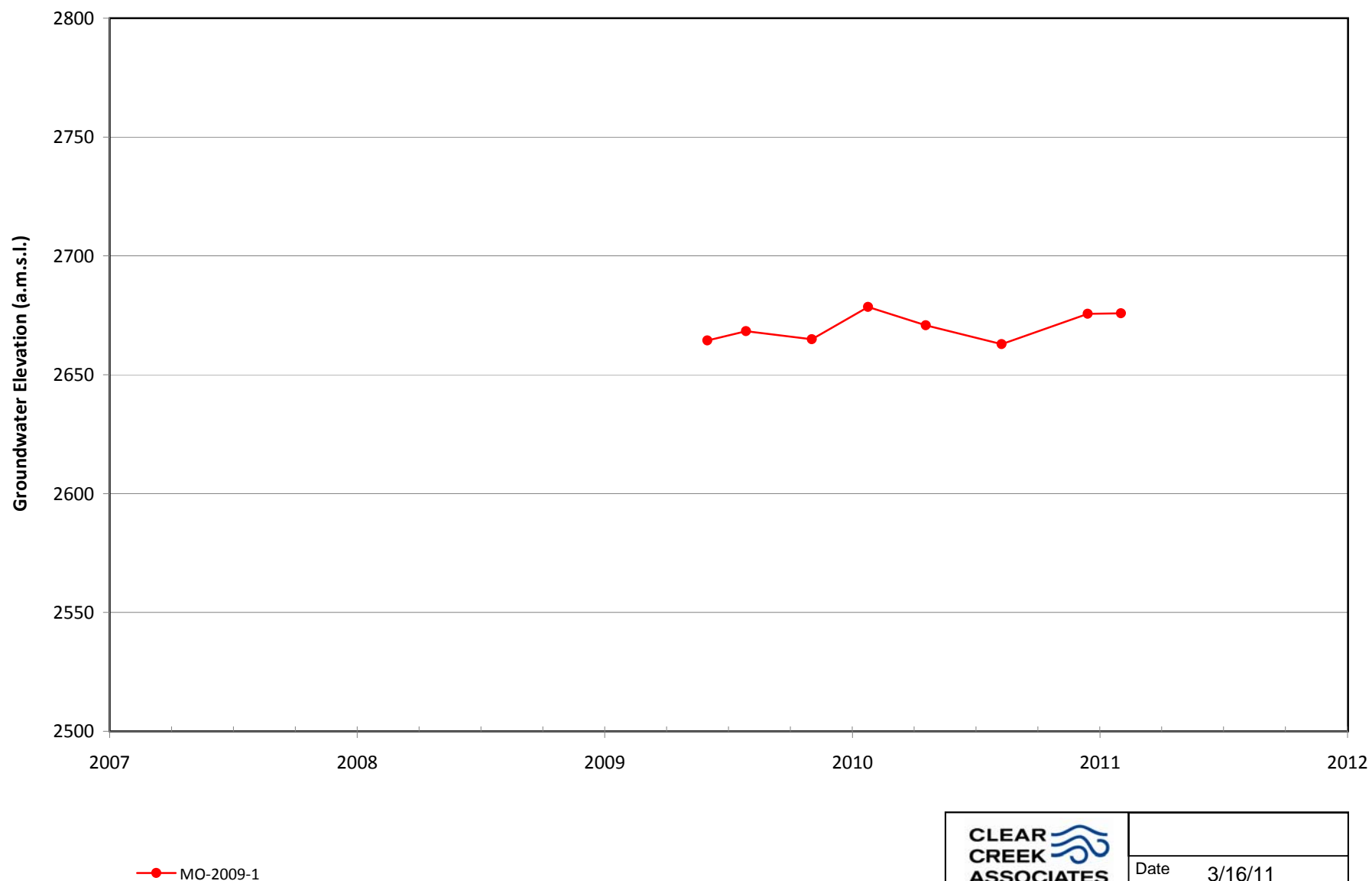


## **APPENDIX D**

### **TIME SERIES GRAPHS OF GROUNDWATER ELEVATION**







**CLEAR  
CREEK  
ASSOCIATES**



Date 3/16/11

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



