SECOND QUARTER 2010
GROUNDWATER MONITORING REPORT

TASKS 1.0 AND 2.2 OF AQUIFER CHARACTERIZATION PLAN
MITIGATION ORDER ON CONSENT DOCKET NO. P-121-07
COCHISE COUNTY, ARIZONA

Prepared for:

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36 West Highway 92
Bisbee, Arizona 85603

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July 20, 2010

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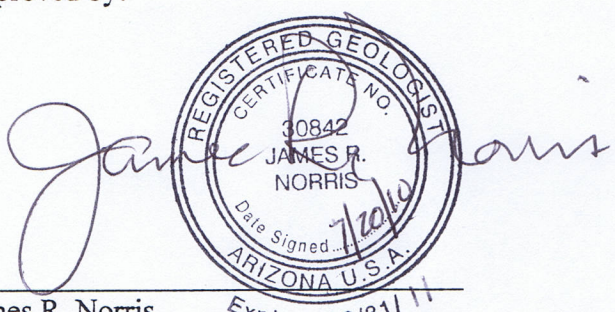

James R. Norris
Arizona Registered Geologist No. 30842

July 20, 2010

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1. INTRODUCTION

This report was prepared for Freeport-McMoRan Corporation Copper Queen Branch (CQB), and provides the results of groundwater monitoring conducted in the second quarter 2010 in the vicinity of the Concentrator Tailing Storage Area (CTSA). Groundwater monitoring was conducted pursuant to Tasks 1.0 and 2.2 of the Work Plan (Hydro Geo Chem, Inc. [HGC], 2008a) to characterize sulfate in the vicinity of the CTSA. The Work Plan was submitted to Arizona Department of Environmental Quality (ADEQ) on December 17, 2007 pursuant to the Mitigation Order on Consent Docket No. P-121-07 (ADEQ, 2007). CQB initiated water sampling prior to work plan approval while ADEQ was commenting on the Work Plan and CQB was responding to their comments. Revision 1 of the Work Plan was submitted to ADEQ on July 3, 2008 and ADEQ approved the Work Plan on August 3, 2008. Clear Creek Associates (Clear Creek) prepared this groundwater monitoring report on behalf of CQB.

1.1 Scope of Groundwater Monitoring

The scope of the groundwater monitoring program is described in Sections 3.2, 3.3.2 and 3.3.3 of the Work Plan (HGC, 2008a). This report presents the results of groundwater monitoring conducted in the second quarter 2010 for Tasks 1.0 and 2.2 of the Work Plan. Groundwater monitoring for Task 1.0 consisted of identifying and sampling private drinking water supply wells and public water supply system wells within one mile of the sulfate plume. The groundwater plume is considered to consist of groundwater with sulfate in excess of 250 milligrams per liter (mg/L) attributable to the CTSA. Ongoing quarterly monitoring of drinking water supply wells and monthly monitoring for sulfate trend analysis at certain wells are conducted as described in Section 4 of the Work Plan. Groundwater monitoring for Task 2.2 consisted of water elevation measurement and collection of groundwater samples from wells in the vicinity of the CTSA. Figure 1 presents a generalized geologic map of the study area and well locations where data were collected during this reporting period.

The Work Plan identifies two purposes for the groundwater monitoring program required in Task 2.2; plume monitoring and regional monitoring. Plume monitoring is conducted quarterly at wells that are proximal to the sulfate plume to track the plume's location in the aquifer. Regional monitoring to characterize hydrologic conditions outside the area of the sulfate plume was completed in the third quarter of 2008 (HGC, 2008b). This report presents the results of well

inventory and plume monitoring conducted during the second quarter of 2010. Pursuant to the Work Plan, the only constituent of interest for monitoring is sulfate.

Table 1 lists wells identified in the Work Plan for plume monitoring, their availability for sampling in the second quarter 2010, and their sampling status. Groundwater sampling and analysis methods used by Clear Creek and CQB are described in the Quality Assurance Project Plan (QAPP) contained in Appendix F of the Work Plan (HGC, 2008a). Results of groundwater monitoring for Tasks 1.0 and 2.2 are presented in Section 2.

1.2 Changes to Groundwater Monitoring for Second Quarter 2010

Changes to the groundwater monitoring program during the second quarter 2010 include a change in the laboratory that provides analytical results and collection of samples at some wells by CQB personnel. Analytical results for groundwater samples collected during the second quarter 2010 were provided to Clear Creek by SVL Analytical, Inc. (SVL). Quality control information for SVL is discussed in Appendix A. Appendix B contains SVL's Quality Manual. CQB personnel sampled monitoring wells owned by CQB on mine and private property. Clear Creek conducted sampling at privately owned wells.

2. GROUNDWATER MONITORING RESULTS

2.1 Results of Monitoring for Tasks 1.0 and 2.2

Analytical results and groundwater elevation data for the second quarter 2010 are tabulated in Tables 2 and 3 respectively. Figure 2 shows the concentrations of dissolved sulfate in the wells sampled in the second quarter 2010. The most recent sample results are shown at wells where multiple samples were collected during the quarter. The highest sulfate concentration measured at co-located wells was used for concentration contouring. Figure 3 shows groundwater elevations in the second quarter 2010. Groundwater elevations were calculated using the depth to water measurements made under static (nonpumping) conditions for all wells shown.

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 and analytical laboratory reports for data collected by Clear Creek and CQB during the second quarter 2010 are included in Appendix A and Appendix C, respectively. Copies of groundwater sampling forms for samples collected by Clear Creek and CQB are in Appendix D. As determined by the analytical data verification review, all data for samples collected in the second quarter 2010 by Clear Creek and CQB are of acceptable quality for use in the groundwater monitoring being conducted pursuant to the Mitigation Order.

3. FINDINGS

This report provides the results of groundwater monitoring conducted within the vicinity of the CTSA for the second quarter 2010. Groundwater samples were collected from 77 plume monitoring and well inventory wells, and depth to water measurements were collected at 73 wells. The April 2009 Aquifer Characterization Report (HGC, 2009) provides detailed descriptions of the hydrogeology, water quality, and sulfate plume. Findings based on the second quarter 2010 groundwater monitoring are described below.

- Water quality samples have been collected from wells completed in three principal water bearing units in the area: basin fill, undifferentiated Bisbee Group, and Glance Conglomerate. The undifferentiated Bisbee Group consists, from youngest to oldest, of the Cintura Formation, Upper Mural Limestone, Lower Mural Limestone and Morita Formation. Figures 2 and 3 provide the screened lithology of the wells sampled.

- Sulfate concentration data indicate that the plume extends to the southwest from the vicinity of the former evaporation pond to the vicinity of Naco and to the south to the vicinity of Bisbee Junction (Figure 2). The groundwater monitoring data indicate that the sulfate plume extends over an area of approximately 2.5 miles by 3.9 miles and is contained primarily in the basin fill and undifferentiated Bisbee Group except near the former evaporation pond where wells in the Glance Conglomerate have sulfate concentrations greater than 250 mg/L.

- Comparison of the second quarter 2010 sulfate concentrations with previous quarters indicates no large scale change in the plume geometry since the Mitigation Order sampling began in the second quarter 2008, although concentration contours within the plume have been modified to reflect current concentrations.

- Figure 4 shows sulfate concentrations through time at public drinking water supply wells that are not receiving mitigation actions. Sulfate concentrations have remained relatively stable over time, although NWC-04 displays the greatest variability in concentration

- Groundwater elevations decrease from north to south east of the Black Gap fault in the region between the Bisbee Municipal Airport and Bisbee Junction, and from east to west across the central portion of the study area west of the Black Gap fault (Figure 3).

- Figures 5 and 6 show groundwater elevations over time for BMO monitor wells with screen intervals in basin fill and bedrock, respectively. Groundwater elevations in BMO monitor wells screened in basin fill decrease over time. Groundwater elevations in BMO monitor wells screened in bedrock are relatively steady over time, although BMO-2008-10GL and BMO-2008-11G display increasing trends whereas BMO-2008-1G displays a decreasing trend. Additional data are needed to determine if these are long term trends.

- Groundwater monitoring conducted during the Second Quarter 2010 is deemed to have met the objectives of monitoring drinking water supply wells within one mile of the plume, identifying the location of the plume, and providing potentiometric data in the vicinity of the plume.

4. REFERENCES

Arizona Department of Environmental Quality. 2007. Mitigation Order on Consent, Docket No. P-121-07, In the Matter of: Phelps Dodge Corporation, Copper Queen Branch, located at 36 West Highway 92, Bisbee, Arizona, ADEQ Identification Number 100531. November 14, 2007.

Hydro Geo Chem, Inc. (HGC). 2008a. Revision 1, Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Concentrator Tailing Storage Area, Cochise County, Arizona. July 3, 2008.

HGC. 2008b. Third Quarter 2008, Groundwater Monitoring Report, Tasks 1.0, 2.2 and 2.3 of Aquifer Characterization Plan Mitigation Order on Consent No. P-121-07, Cochise County, Arizona. October 27, 2008.

HGC. 2009. Aquifer Characterization Report, Task 4.0 of Aquifer Characterization Plan, Mitigation Order on Consent Docket No. P-121-07, Cochise County, Arizona, Volume I. April 29, 2009.

TABLES

Table 1
Summary of Groundwater Monitoring for Second Quarter 2010

Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
ANDERSON	613396	Anderson	Well Inventory	236	YES	YES	Water quality sample collected in April 2010
AWC-02	616586	Arizona Water Company	Plume	330	YES	YES	Water quality sample collected in April 2010
AWC-03	616585	Arizona Water Company	Plume	269	YES	YES	Water quality sample collected in April 2010
AWC-04	616584	Arizona Water Company	Plume	250	YES	YES	Water quality sample collected in April 2010
AWC-05	590620	Arizona Water Company	Plume	1183	YES	YES	Water quality sample collected in April 2010
BANKS 986	647986	Banks	Well Inventory	435	NO	YES	Water quality sample collected in April 2010; unable to collect water level because well head is not accessible
BANKS 987	647987	Banks	Well Inventory	339	YES	NO	Well identified for water level measurements only
BARTON 010	085010	Barton	Plume	300	NO	NO	Dry
BARTON 919	644919	Barton	Plume	130	NO	NO	Well not operational; unable to collect water level; unable to contact owner to access property
BF-01	539783	Copper Queen Branch	Plume	400	YES	YES	Water quality sample collected in April 2010
BIMA	577927	Bisbee Municipal Airport	Plume	465	YES	YES	Water quality sample collected in April 2010
BLOMMER	633472	Blommer	Well Inventory	380	NO	NO	Owner declined participation in monitoring program
BMO-2008-1G	909474	Copper Queen Branch	Plume	310	YES	YES	Water quality sample collected in April 2010
BMO-2008-3B	909147	Copper Queen Branch	Plume	260	YES	YES	Water quality sample collected in April 2010
BMO-2008-4B	910096	Copper Queen Branch	Plume	610	YES	YES	Water quality sample collected in April 2010
BMO-2008-5B	909653	Copper Queen Branch	Plume	285	YES	YES	Water quality sample collected in April 2010
BMO-2008-5M	909552	Copper Queen Branch	Plume	450	YES	YES	Water quality sample collected in April 2010
BMO-2008-6B	909146	Copper Queen Branch	Plume	265	YES	YES	Water quality sample collected in April 2010
BMO-2008-6M	909019	Copper Queen Branch	Plume	450	YES	YES	Water quality sample collected in April 2010
BMO-2008-7M	908794	Copper Queen Branch	Plume	670	YES	YES	Water quality sample collected in April 2010

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Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
BMO-2008-8B	910097	Copper Queen Branch	Plume	480	YES	YES	Water quality sample collected in April 2010
BMO-2008-8M	909711	Copper Queen Branch	Plume	1210	YES	YES	Water quality sample collected in April 2010
BMO-2008-9M	909255	Copper Queen Branch	Plume	775	YES	YES	Water quality sample collected in April 2010
BMO-2008-10GL	909435	Copper Queen Branch	Plume	810	YES	YES	Water quality sample collected in April 2010
BMO-2008-10GU	909272	Copper Queen Branch	Plume	449	YES	YES	Water quality sample collected in April 2010
BMO-2008-11G	909434	Copper Queen Branch	Plume	760	YES	YES	Water quality sample collected in April 2010
BMO-2008-13B	909551	Copper Queen Branch	Plume	474	YES	YES	Water quality sample collected in April 2010
BMO-2008-13M	909760	Copper Queen Branch	Plume	1030	YES	YES	Water quality sample collected in April 2010
BULLARD	602134	Bullard	Plume	300	NO	NO	Well not operational; unable to collect water level measurement due to obstruction in well
BURKE	212268	Burke	Plume	781	NO	YES	Water quality sample collected in April 2010; unable to collect water level due to obstruction in well
CHAMBERS	629807	Chambers	Well Inventory	245	NO	YES	Water quality sample collected in April 2010; unable to collect water level due to obstruction in well
COB MW-1	903992	City of Bisbee	Plume	420	YES	YES	Water quality sample collected in April 2010
COB MW-2	903984	City of Bisbee	Plume	170	YES	YES	Water quality sample collected in April 2010
COB MW-3	906823	City of Bisbee	Plume	269	YES	YES	Water quality sample collected in April 2010
COB WL	593116	City of Bisbee	Plume	150	YES	YES	Water quality sample collected in April 2010
COLLINS[1]	565260	Collins	Well Inventory	320	YES	YES	Water quality sample collected in April 2010
COOPER	623564	Cooper, Teresa	Plume	325	NO	YES	Water quality sample collected in April 2010; unable to collect water level because well head is not accessible
COOPER C	637069	Cooper, Charles	Plume	220	YES	YES	Water quality sample collected in April 2010
CROWLEY	510298	Crowley	Plume	788	NO	NO	Dry
DODSON	644927	Dodson	Plume	200	YES	YES	Water quality sample collected in April 2010

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Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
DOUGLASS 791	592791	Douglass	Well Inventory	200	YES	NO	Well is not operational; identified for water level measurements only
DOUGLASS 792	592792	Douglass	Well Inventory	200	YES	NO	Well is not operational; identified for water level measurements only
DURAZO	NR	Durazo	Well Inventory	ND	NO	YES	Water quality sample collected in April 2010; unable to collect water level because there is no access to well casing
EAST	599796	East	Well Inventory	125	YES	YES	Water quality sample collected in April 2010
EPPELE 641	805641	Eppele	Well Inventory	265	NO	NO	Well is not operational; unable to contact well owner to access well for water level measurement
FLEMING	218386	Fleming	Well Inventory	400	YES	NO	Well is not operational; identified for water level measurements only
FRANCO	500101	Franco	Well Inventory	200	NO	YES	Water quality sample collected in April 2010; unable to collect water level due to obstruction
FULTZ	212447	Fultz	Well Inventory	300	YES	YES	Water quality sample collected in April 2010
GALLANT	502527	Gallant	Regional	190	NO	NO	Program completed third quarter 2008
GARNER 557	558557	Garner	Plume	300	YES	NO	Well identified for water level measurements only
GARNER 635	587635	Garner	Plume	680	YES	YES	Water quality sample collected in April 2010
GGOOSE 546	628546	Galloping Goose Properties	Plume	430	NO	NO	Well not operational; unable to collect water level due to obstruction
GGOOSE 547	628547	Galloping Goose Properties	Plume	800	YES	NO	Unable to collect water quality sample due to electrical problem with pump
GL-03	539782	Copper Queen Branch	Plume	820	YES	YES	Water quality sample collected in April 2010
GOAR RANCH	610695	Goar	Well Inventory	250	YES	NO	Well identified for water level measurements only
GREGG	630852	Gregg	Plume	ND	NO	NO	Dry
HOBAN	805290	Hoban	Well Inventory	316	YES	NO	Unable to collect water quality sample due to electrical power being switched off
HOWARD	NR	Howard	Well Inventory	200	YES	YES	Water quality sample collected in April 2010
HULL 854	606854	Hull	Plume	25	NO	NO	Well not located
KEEFER	209744	Keefer	Well Inventory	245	YES	YES	Water quality sample collected in April 2010

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Summary of Groundwater Monitoring for Second Quarter 2010

Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
MCCONNELL 265	539265	McConnell	Well Inventory	216	YES	YES	Water quality sample collected in April 2010
METZLER	35-71891	Metzler	Well Inventory	351	YES	YES	Water quality sample collected in May 2010
MILLER 340	641340	Miller	Plume	200	NO	NO	Dry
MILLER 341	641341	Miller	Plume	100	NO	NO	Dry
MINOR 317	063317	Minor	Well Inventory	155	NO	NO	Owner declined participation in monitoring program
MOORE	538847	Moore	Well Inventory	220	NO	YES	Water quality sample collected in April 2010
MOROYOQUI	647847	Moroyoqui	Well Inventory	290	NO	NO	Dry
NESS	509127	Ness	Well Inventory	812	YES	YES	Water quality sample collected in April 2010
NOTEMAN	212483	Noteman	Well Inventory	400	NO	YES	Water quality sample collected in April 2010; unable to collect water level due to obstruction in well
NSD-02	527587	Naco Sanitary District	Water Level	120	YES	NO	Well identified for water level measurements only
NSD-03	527586	Naco Sanitary District	Water Level	100	YES	NO	Well identified for water level measurements only
NWC-02	562944	Naco Water Company	Plume	312	NO	YES	Water quality sample collected in April 2010; unable to collect water level because the well was pumping
NWC-03	203321	Naco Water Company	Plume	312	NO	YES	Water quality sample collected in April 2010; unable to collect water level because the well was pumping
NWC-03 CAP	627684	Naco Water Company	Plume	179	YES	NO	Well identified for water level measurements only
NWC-04	551849	Naco Water Company	Well Inventory Sulfate Trend	795	NO	YES	Water quality sample collected in April 2010; unable to collect water level because the well was pumping
NWC 04 CAP	627685	Naco Water Company	Plume	379	NO	NO	Well capped
NWC-06	575700	Naco Water Company	Well Inventory	410	NO	YES	Water quality sample collected in April 2010; unable to collect water level because the well was pumping
OSBORN	643436	Osborn	Plume	258	YES	YES	Water quality sample collected in April 2010
PALMER	578819	Palmer	Well Inventory	220	NO	YES	Water quality sample collected in April 2010; unable to collect water level because wellhead is inaccessible
PANAGAKOS	35-76413	Panagakos	Well Inventory	200	YES	YES	Water quality sample collected in April 2010

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Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
PARRA	576415	Parra	Plume	355	NO	YES	Water quality sample collected in April 2010; unable to collect water level because of obstruction in well
PIONKE	613395	Pionke	Well Inventory	300	YES	YES	Water quality sample collected in April 2010
POOL	509518	Pool	Well Inventory	313	YES	YES	Water quality sample collected in April 2010
POWER	624535	Power	Regional	100	NO	NO	Program completed third quarter 2008
RAMIREZ	216425	Ramirez	Well Inventory	300	YES	YES	Water quality sample collected in April 2010
RAY	803772	Ray	Well Inventory	100	YES	YES	Water quality sample collected in April 2010
ROGERS 596 [2]	573596	Rogers, Ernest D	Plume	290	YES	YES	Water quality sample collected in April 2010
ROGERS E	216018	Rogers, Ernest M	Well Inventory	290	YES	YES	Water quality sample collected in April 2010
RUIZ	531770	Ruiz	Well Inventory	312	YES	YES	Water quality sample collected in April 2010
SCHWARTZ	210865	Schwartz	Well Inventory	305	YES	YES	Water quality sample collected in April 2010
SRC	211345	Specialty Resaurants Corporation	Regional	965	NO	NO	Program completed third quarter 2008
STEPHENS	808560	Stephens	Well Inventory	NR	YES	NO	Well identified for water level measurements only
SUNBELT	201531	Sunbelt Marketing, Inc.	Well Inventory	380	YES	NO	Well identified for water level measurements only
SWAN	NR	Swan	Well Inventory	NR	YES	YES	Water quality sample collected in April 2010
TM-02	522573	Copper Queen Branch	Plume	640	NO	NO	Unable to collect water quality sample because pump intake is above water level; unable to collect water level due to obstruction in well
TM-02A	522574	Copper Queen Branch	Plume	925	YES	YES	Water quality sample collected in April 2010
TM-03	522575	Copper Queen Branch	Plume	200	YES	YES	Water quality sample collected in April 2010
TM-06 MILLER	522695	Miller	Plume	200	YES	YES	Water quality sample collected in April 2010
TM-07	522576	Copper Queen Branch	Plume	350	NO	YES	Water quality sample collected in May 2010; unable to collect water level due to obstruction in well
TM-08 SWAN	522817	Swan	Regional	817	NO	NO	Program completed third quarter 2008

Table 1
Summary of Groundwater Monitoring for Second Quarter 2010

Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
TM-10 USBP	522696	U.S. Border Patrol	Plume	290	NO	NO	Owner declined participation in monitoring program
TM-11 PIONKE	522815	Pionke	Plume	160	NO	NO	Dry
TM-13 MILLER	522698	Miller	Plume	200	NO	NO	Dry
TM-15 MILLER	522699	Miller	Well Inventory	325	NO	YES	Water quality sample collected in May 2010; unable to collect water level due to obstruction in well
TM-16	522578	Copper Queen Branch	Plume	115	YES	YES	Water quality sample collected in April 2010
TM-17	522700	Copper Queen Branch	Plume	200	NO	NO	Dry
TM-19	522581	Copper Queen Branch	Plume	210	NO	NO	Dry
TM-19A	522580	Copper Queen Branch	Plume	700	YES	YES	Water quality sample collected in April 2010
TM-41	562555	Copper Queen Branch	Plume	210	NO	NO	Dry
TM-42	562554	Copper Queen Branch	Plume	250	YES	YES	Water quality sample collected in April 2010
TM-43	564729	Copper Queen Branch	Regional	830	NO	NO	Program completed third quarter 2008
TM-43A	564726	Copper Queen Branch	Regional	215	NO	NO	Program completed third quarter 2008
TVI 236	802236	Turquoise Valley, Inc.	Well Inventory	222	YES	YES	Water quality sample collected in April 2010
TVI 713	567713	Turquoise Valley, Inc.	Well Inventory	200	YES	NO	Well identified for water level measurements only
TVI 875	568875	Turquoise Valley, Inc.	Plume	330	NO	YES	Water quality sample collected in April 2010; unable to collect water level because well head is not accessible
WALKER	200393	Walker	Regional	120	NO	NO	Program completed third quarter 2008
WEED	544535	Weed	Plume	320	NO	YES	Water quality sample collected in April 2010; unable to collect water level because well head is not accessible

Table 1
Summary of Groundwater Monitoring for Second Quarter 2010

Well Name	ADWR 55 Registry No.	Owner	Monitoring Purpose	Casing Depth (feet)	Water Level Measured?	Water Sample Collected?	Status
WEISKOPF	641802	Weiskopf	Plume	200	YES	YES	Water quality sample collected in April 2010
ZANDER	205126	Zander	Well Inventory	280	YES	YES	Water quality sample collected in April 2010

ADWR = Arizona Department of Water Resources

BIMA = Bisbee Municipal Airport

ft amsl = feet above mean sea level

ND = No Data

NR = No Record

35-71891 = ADWR 35 Database

[1] former owner ENGLUND

[2] previousely identified as ROGERS 803

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
ANDERSON	613396	3/20/08	7.25	21.1	1176	431
		5/5/08	7.03	21.8	1231	452
		7/14/08	7.11	21.6	1260	472
		10/15/08	7.10	21.3	1252	475
		1/27/09	7.27	21	965	488
		4/14/09	7.12	21.8	1229	534
		7/14/09	7.03	22.2	1372	550
		10/12/09	6.98	21.5	1375	510
		1/27/10	7.93	20.1	1449	523
		4/21/10	7.40	20.7	1439	627
AWC-02	616586	1/7/08	ND	ND	ND	14
		3/3/08	ND	ND	ND	16
		5/5/08	ND	ND	ND	13.3
		8/12/08	7.01	22.3	630	14.3
		10/23/08	7.31	23.1	464	15.9
		3/11/09	7.19	21.8	420	15.5
		4/22/09	7.17	22.6	430	14.7
		7/22/09	7.24	22.7	444	14.2
		10/21/09	7.19	21.3	468	16.8
		2/3/10	7.44	19.7	449	18.6
		4/23/10	7.56	19.7	526	18.3
AWC-03	616585	1/7/08	ND	ND	ND	41
		3/3/08	ND	ND	ND	38
		5/5/08	ND	ND	ND	37.3
		8/12/08	7.28	22.4	469	38.8
		10/23/08	7.48	21.0	462	41.8
		3/11/09	7.25	21.2	445	64.2
		4/22/09	7.30	21.4	452	42.4
		7/22/09	7.39	22.6	456	41.8
		10/21/09	7.48	21.3	540	50.5
		2/3/10	7.44	19.7	449	42.0
		4/23/10	7.57	19.7	468	44.4
AWC-04	616584	2/4/08	ND	ND	ND	18
		4/7/08	ND	ND	ND	18
		6/2/08	ND	ND	ND	14.3
		8/12/08	7.08	22.5	458	21.6
		10/23/08	6.91	22.2	616	24
		3/11/09	7.02	21.3	539	27.2
		4/22/09	6.93	22.1	560	26.1
		7/22/09	7.13	22.5	587	26.2
		10/21/09	7.00	21.2	607	25.7
		2/3/10	7.35	19.3	438	16.3
		4/23/10	7.14	19.2	625	27.4

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
AWC-05	590620	2/4/08	ND	ND	ND	13
		4/7/08	ND	ND	ND	14
		6/2/08	ND	ND	ND	14.3
		8/12/08	6.74	23.3	425	14.9
		10/23/08	7.45	21.0	422	15.4
		3/11/09	7.31	22.1	398	16.5
		6/3/09	7.33	22.0	418	12.1
		7/22/09	7.49	24.4	423	14.1
		10/21/09	7.37	21.1	433	16.5
		2/3/10	7.35	19.3	438	16.3
		4/23/10	7.62	18.9	443	17.6
BANKS 986	647986	2/27/08	7.53	21.8	980	44
		5/12/08	7.40	22.1	1021	65.2
		7/21/08	7.43	22.9	1034	82.2
		10/13/08	7.28	21.7	980	53
		1/21/09	7.66	21.6	872	164
		4/8/09	7.56	22.7	933	47
		7/9/09	7.59	23.1	871	70.9
		10/7/09	7.50	22.2	838	67.7
		2/25/10	7.56	21.1	1020	50.5
		4/20/10	7.71	22.8	1013	53.9
BF-01	539783	3/4/08	6.46	21.9	2745	1320
		5/23/08	6.41	18.3	2698	1450
		8/5/08	6.11	22.4	3095	1330
		11/5/08	6.33	19.9	3027	1490
		2/20/09	6.42	19.2	1477	1330
		5/6/09	5.98	23.9	2632	1280
		8/17/09	6.21	29.7	2948	1250
		11/4/09	6.24	23.0	2846	1280
		3/1/10	6.34	21.1	2945	1260
		4/7/10	5.83	20.4	1853	1450
BIMA	577927	2/6/08	6.69	22.2	1335	210
		4/25/2008[1]	6.37	23.1	1521	190
		5/13/2008[1]	6.58	22.7	1489	195
		6/23/2008[1]	6.30	23.3	1572	225
		6/23/08 DUP	6.30	23.3	1572	196
		7/29/2008[1]	6.44	23.0	1647	204
		8/28/2008[1]	M	23.0	1776	256
		9/23/2008[1]	6.29	23.0	1741	296
		10/22/08	6.41	22.3	1801	285
		1/20/09	6.40	21.7	1233	190
		1/20/09 DUP	6.40	21.7	1233	200
		4/7/09	6.45	23.4	1436	212
		7/8/09	6.31	23.4	1483	189
		10/5/09	6.34	22.7	1525	233
		1/20/10	6.88	17.0	NA	222
		4/19/10	6.70	21.9	1533	256

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
BLOMMER	633472	2/5/08	7.43	20.2	714	206
		4/21/2008[1]	7.06	21.9	753	201
		5/15/2008[1]	7.16	22.2	845	211
		6/23/2008[1]	6.93	21.5	903	193
		7/29/2008[1]	7.21	22.2	921	203
		8/27/2008[1]	7.12	22.1	864	189
		9/23/2008[1]	7.16	22.3	818	193
		10/22/08	7.17	21.3	873	200
BMO-2008-1G	909474	8/27/08	7.09	24.2	808	107
		11/11/08	7.00	20.8	721	143
		2/25/09	7.01	22.0	860	109
		4/28/09	7.04	22.2	762	198
		8/4/09	7.23	22.8	950	104
		10/27/09	7.11	21.9	922	103
		2/17/10	7.36	20.5	899.3	98.4
		4/15/10	7.04	22.2	711	95.2
BMO-2008-3B	909147	7/18/08	7.35	23.9	615	106
		11/4/08	7.36	21.4	599	179
		11/4/08 DUP	7.36	21.4	599	177
		2/19/09	7.24	21.4	664	155
		5/11/09	7.23	22.1	631	149
		8/6/09	7.33	21.4	718	151
		8/6/09 DUP	7.33	21.4	718	156
		10/26/09	7.32	21.8	684	153
		3/3/10	7.38	21.4	695	164
		4/8/10	6.47	21.3	585	162
BMO-2008-4B	910096	12/11/08	7.34	22.8	374	9.4
		2/18/09	7.17	23.2	370	13.4
		4/30/09	7.33	24.5	376	11.4
		4/30/09 DUP	7.33	24.5	376	11.8
		8/6/09	7.53	24.6	397	11.5
		10/27/09	7.53	23.7	379	11.2
		2/24/10	7.48	21.8	362	9.7
		4/16/10	7.70	23.4	330	9.73
BMO-2008-5B	909653	9/30/08	7.08	22.0	688	193
		2/18/09	7.03	21.5	691	192
		4/27/09	7.32	22.1	605	177
		8/4/09	7.35	22.3	724	174
		10/29/09	7.29	21.8	731	181
		10/29/09 DUP	7.29	21.8	731	185
		2/15/10	7.22	21.7	720	185
		4/15/10	7.21	23.0	571	194
BMO-2008-5M	909552	10/2/08	7.13	23.6	551	107
		2/18/09	7.06	22.5	562	122
		4/27/09	7.50	22.9	501	111
		8/4/09	7.53	23.1	605	122
		10/29/09	7.35	22.4	610	123
		2/15/10	7.31	22.5	581	123
		4/16/10	7.28	22.6	509	125
		4/16/10 DUP	7.28	22.6	509	124

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
BMO-2008-6B	909146	7/16/08	7.36	24.1	475	53.3
		11/4/08	7.41	21.5	398	60.3
		2/19/09	7.23	21.1	444	54.3
		4/27/09	7.55	21.7	389	52.7
		8/4/09	7.48	23.4	470	48.5
		10/26/09	7.29	22.5	448	48.7
		2/15/10	7.53	21.2	391	33.5
		4/15/10	7.47	21.0	362	37.0
BMO-2008-6M	909019	7/10/08	M	22.1	702	182
		11/4/08	7.33	21.8	621	199
		2/20/09	7.11	22.0	702	193
		4/28/09	7.34	22.4	595	119
		8/4/09	7.40	23.3	750	189
		10/26/09	7.18	22.4	727	187
		2/15/10	7.29	20.8	733	193
		4/15/10	7.36	20.2	619	208
BMO-2008-7M	908794	7/14/08	7.63	25.2	500	31.4
		11/6/08	7.53	22.6	380	34.5
		2/18/09	7.31	23.3	452	27.6
		5/11/09	7.43	24.4	426	26.0
		8/6/09	7.81	24.1	486	25.1
		10/27/09	7.53	23.0	470	26.1
		2/17/10	7.57	23.4	452	25.4
		2/17/10 DUP	7.57	23.4	452	25.0
		4/15/10	7.52	23.2	415	26.0
BMO-2008-8B	910097	12/5/08	6.47	20.1	2480	1890
		2/19/09	6.19	21.0	2958	1570
		5/5/09	6.18	21.3	2888	1370
		8/10/09	6.42	21.5	2897	1250
		11/9/09	6.33	21.8	2889	1510
		11/9/09 DUP	6.33	21.8	2889	1520
		3/3/10	6.51	20.4	3016	1320
		4/16/10	6.06	21.4	1682	1470
BMO-2008-8M	909711	12/9/08	7.16	23.4	852	197
		2/19/09	7.27	23.5	758	147
		2/19/09 DUP	7.27	23.5	758	149
		5/5/09	7.19	25.1	680	122
		8/10/09	7.49	24.8	673	107
		11/5/09	7.30	25.4	675	104
		3/3/10	7.70	24.1	641	99.5
		4/16/10	7.29	24.5	541	97.0
BMO-2008-9M	909255	8/8/08	7.72	25.7	415	47.3
		11/5/08	7.89	21.4	444	54.4
		2/26/09	7.71	24.5	482	28.8
		5/12/09	7.76	24.8	449	51.7
		8/17/09	7.76	25.6	534	53.4
		11/3/09	7.82	24.9	552	56.9
		3/4/10	8.07	22.4	520	58.6
		4/6/10	6.74	23.8	484	60.1

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
BMO-2008-10GL	909435	8/20/08	6.22	29.5	2924	1320
		11/5/08	6.47	25.3	2573	1290
		2/25/09	6.34	26.8	2646	1180
		5/12/09	6.35	26.2	2402	1120
		8/11/09	6.52	27.3	2661	1030
		11/2/09	6.52	26.7	2565	1100
		3/4/10	6.76	24.1	2937	1080
		4/8/10	6.03	25.6	1575	1260
BMO-2008-10GU	909272	8/4/08	6.41	23.6	3660	2210
		11/5/08	6.15	20.2	3343	1890
		2/25/09	5.96	22.7	3426	1740
		5/6/09	5.99	23.2	3359	1710
		8/11/09	6.28	22.5	3348	1690
		11/2/09	6.27	21.8	3157	1730
		3/10/10	6.67	19.1	3951	1700
		4/7/10	5.96	20.4	3210	1510
BMO-2008-11G	909434	8/22/08	8.02	28.2	359	14.2
		11/12/08	7.96	24.2	257	13.9
		2/26/09	7.92	25.1	319	12.3
		4/28/09	8.14	25.5	273	11.8
		8/12/09	8.24	25.3	365	11.2
		11/9/09	8.03	25.5	339	13.9
		3/1/10	8.37	23.2	338	13.0
		4/9/10	6.88	24.5	301	13.0
BMO-2008-13B	909551	10/3/08	6.49	21.6	2180	980
		2/17/09	6.51	20.9	1941	1000
		5/6/09	6.55	22.0	1891	930
		8/5/09	6.63	21.5	2137	950
		10/28/09	6.81	19.7	2259	1010
		2/16/10	6.87	20.8	2093	997
		4/14/10	6.38	21.2	1346	974
BMO-2008-13M	909760	12/3/08	7.73	24.1	1463	494
		2/17/09	8.21	22.7	1340	441
		4/29/09	8.04	24.8	1126	217
		8/5/09	8.04	25.4	1392	387
		10/28/09	8.12	21.4	1347	403
		2/16/10	8.07	24.9	1297	375
		4/13/10	8.06	23.2	1130	398
BURKE	212268	2/7/08	7.17	23.0	411	29.5
		4/22/08	7.13	27.0	423	26
		8/5/08	7.06	26.8	496	21.9
		10/20/08	7.57	26.0	466	20.5
		2/11/09	7.23	25.0	363	23.9
		4/28/09	7.16	26.1	369	24.2
		8/19/09	7.36	26.7	486	22.5
		12/16/09	7.28	25.7	488	26
		3/2/10	7.56	12.3	432	23.8
		4/22/10	7.49	16.4	452	24.8

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
CHAMBERS	629807	3/6/08	7.73	17.8	408	7.7
		5/5/08	7.15	22.1	421	6
		7/14/08	7.43	23.2	434	5.8
		10/15/08	7.41	22.5	420	4
		1/27/09	7.57	21.5	312	5.3
		4/14/09	7.42	22.4	384	6.8
		7/15/09	7.83	23.4	414	4.3
		10/13/09	7.41	22.6	410	6.5
		1/26/10	7.31	21.3	416	5.7
		4/23/10	7.47	20.9	427.5	8.34
COB MW-1	903992	2/22/08	6.93	21.2	1401	720
		5/20/08	6.88	22.0	2050	980
		7/30/08	6.88	21.7	1780	730
		10/23/08	6.95	21.2	1690	750
		2/12/09	6.92	21.1	1313	750
		4/21/09	7.15	22.7	1366	720
		7/22/09	6.94	21.6	1570	680
		7/22/09 DUP	6.94	21.6	1570	730
		10/22/09	6.81	22.3	1582	820
		2/4/10	7.04	21.1	1653	680
		4/20/10	6.92	21.8	1836	783
COB MW-2	903984	2/22/08	7.28	20.2	417	41
		5/20/08	7.32	21.2	490	40.5
		7/30/08	7.34	20.8	511	37.6
		10/23/08	7.36	20.3	498	34.9
		2/12/09	7.35	20.2	379	35.6
		4/23/09	7.33	21.8	431	34
		7/22/09	7.36	21.3	483	33.5
		10/22/09	7.24	21.0	454	32.2
		3/3/10	7.55	19.7	450	33.5
		4/26/10	7.28	21.3	479.6	34.8
COB MW-3	906823	2/28/08	7.39	21.0	416	57.8
		3/27/08	ND	ND	ND	57.7
		4/30/08	ND	ND	ND	37
		5/20/08	7.56	22.3	473	35.8
		7/24/08	ND	ND	ND	64.9
		7/30/08	7.64	22.3	541	67.3
		10/9/08	ND	ND	ND	52.5
		10/23/08	7.43	20.8	507	76.6
		2/12/09	7.35	21.1	432	112
		4/23/09	7.35	22.6	407	43.7
		7/22/09	7.38	21.5	460	52.3
		10/22/09	7.40	21.3	466	74.2
		10/22/09 DUP	7.40	21.3	466	73.9
		3/3/10	7.36	21.1	480	102
		4/26/10	7.35	22.0	497.9	77.6

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
COB WL	593116	2/22/08	6.99	20.6	919	90
		3/24/08	ND	ND	ND	98.2
		4/28/08	ND	ND	ND	98.7
		5/20/08	7.30	21.9	1053	98
		7/30/08	7.17	22.0	1098	97.1
		7/30/08	ND	ND	ND	100
		10/15/08	ND	ND	ND	107
		10/23/08	7.23	21.4	1075	104
		2/12/09	6.98	20.6	814	94
		4/23/09	7.29	22.2	923	98
		7/22/09	7.17	22.5	1037	97.3
		10/22/09	7.17	22.4	988	96.1
		3/3/10	7.48	21.1	1030	97.1
		4/26/10	7.36	21.9	1038	97.7
		4/26/10 DUP	7.36	21.9	1038	97.9
COLLINS	565260	2/12/08	6.88	21.6	1470	520
		5/29/08	7.01	22.0	1459	520
		7/31/08	6.86	21.6	1502	536
		10/20/08	8.44	24.7	1510	518
		2/11/09	6.68	21.4	1147	567
		4/21/09	6.92	22.5	1150	499
		7/22/09	7.00	22.4	1413	460
		10/20/09	6.60	21.9	1432	513
		2/2/10	6.98	21.2	1439	471
		4/23/10	6.99	20.6	1472	561
COOPER	623564	2/14/08	7.02	20.8	371	33
		5/14/08	8.08	22.1	419	34.2
		7/31/08	7.81	28.4	455	33.7
		10/20/08	8.44	24.7	448	31.2
		2/11/09	7.32	19.2	333	34.3
		4/21/09	8.19	24.9	346	33.4
		7/20/09	8.45	29.8	430	32.3
		10/14/09	7.85	24.6	423	33.6
		2/1/10	7.83	13.6	433	32.4
		4/22/10	7.82	17.9	433	34.5
COOPER C	637069	3/20/08	6.93	21.3	2081	880
		5/5/08	6.78	22.4	2139	990
		7/15/08	6.86	22.3	2162	1040
		7/15/08 DUP	6.86	22.3	2162	960
		10/16/08	6.80	21.4	2078	1020
		1/27/09	6.92	20.5	1489	950
		4/14/09	6.85	21.6	1833	930
		7/14/09	6.75	22.1	1972	910
		10/12/09	6.70	21.8	1858	830
		1/27/10	7.27	19.6	1930	620
		4/22/10	6.76	19.5	1921	884

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
DODSON	644927	2/20/08	7.61	17.3	857	54
		5/12/08	7.11	21.1	1118	34.2
		7/24/08	7.25	21.6	1233	49.3
		10/13/08	7.15	20.5	1095	56.9
		1/22/09	7.20	20.4	892	51.8
		4/9/09	7.09	21.4	1103	50.1
		7/8/09	7.18	21.1	1153	55.9
		10/6/09	7.07	21.1	1140	49.3
		1/21/10	7.15	18.9	1227	44.6
		4/19/10	7.46	19.9	1261	48.8
		4/19/10 DUP	7.46	19.9	1261	48.6
DURAZO	NR	2/10/09	7.22	18.8	848	386
		4/20/09	7.37	22.7	901	367
		7/15/09	7.57	22.8	1102	332
		10/14/09	7.17	21.9	1048	377
		2/1/10	7.30	21.1	1105	344
		4/26/10	7.22	23.1	1099	388
EAST	599796	2/8/08	7.45	19.9	423	10.6
		5/14/08	7.31	20.9	595	14.8
		7/23/08	7.34	20.8	605	11.8
		10/14/08	7.33	20.3	531	8.9
		1/20/09	7.33	20.0	482	12.5
		4/8/09	7.32	20.6	555	15.9
		7/13/09	7.33	21.2	613	13.8
		10/8/09	7.29	20.8	593	13.4
		1/25/10	7.08	19.0	585	10.7
		4/21/10	7.42	20.5	616	14.4
		4/21/10 DUP	7.42	20.5	616	13.9
EPPELE 641	805641	3/11/08	7.98	21.4	646	21.7
		5/12/08	7.21	21.7	667	24.7
		7/21/08	7.49	23.9	605	19
		10/14/08	7.56	20.4	642	21.8
		1/21/09	7.60	21.1	500	22.7
		4/8/09	7.56	22.4	538	19.7
		7/9/09	7.43	24.3	550	17.5
FRANCO	500101	2/6/08	7.47	19.6	1301	670
		5/5/08	6.93	23.1	1557	680
		7/14/08	7.00	22.7	1586	680
		10/15/08	7.20	20.5	1560	680
		1/22/09	7.19	20.1	1178	740
		4/14/09	7.24	23.1	1416	690
		7/13/09	7.30	27.3	1532	670
		10/12/09	7.16	24.2	1493	650
		1/26/10	6.91	18.5	1529	640
		4/23/10	7.43	15.8	1559	699

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
FULTZ	212447	2/27/08	6.76	21.1	1827	152
		4/21/2008[1]	6.74	22.0	1739	137
		5/14/2008[1]	6.88	22.3	1532	131
		6/23/2008[1]	6.74	22.0	1788	111
		7/29/2008[1]	6.74	22.2	1989	152
		8/28/2008[1]	M	21.6	1889	137
		9/23/2008[1]	6.82	21.9	1821	137
		10/22/08	6.80	21.4	1940	145
		1/21/09	6.74	21.2	1481	82
		4/9/09	6.78	21.5	1695	138
		7/13/09	7.04	23.4	1452	81
		10/8/09	7.00	21.6	1262	72
		10/8/09 DUP	7.00	21.6	1262	71.8
		1/25/10	7.11	21.8	1282	66.7
		4/20/10	7.32	21.2	1202	68.3
GALLANT	502527	2/11/08	7.46	20.2	604	17.9
		7/23/08	7.26	21.2	925	20.9
GARNER 635	587635	2/4/08	7.61	22.7	479	37.8
		5/5/08	7.26	24.9	468	35.8
		7/15/08	7.63	25.6	480	37.4
		10/15/08	7.65	24.1	472	36
		1/28/09	7.69	23.4	368	37.4
		4/15/09	7.83	24.1	412	36.9
		7/16/09	7.56	25.1	445	35.7
		10/14/09	7.58	25.2	446	36.1
		2/2/10	7.79	22.8	465	35.1
		4/22/10	7.84	23.7	464.1	36.9
GGOOSE 547	628547	5/21/08	7.08	22.7	856	199
		8/15/08	7.02	24.8	915	178
		10/29/08	7.27	22.6	897	216
		2/24/09	7.06	23.8	851	186
		5/14/09	7.15	23.9	743	174
		8/19/09	7.20	23.8	887	175
		11/11/09	7.15	23.1	897	188
GL-03	539782	3/4/08	7.43	25.7	417	20.3
		5/22/08	7.06	25.3	647	43.3
		8/4/08	7.10	26.8	673	36.1
		11/12/08	7.21	25.2	478	34.9
		2/26/09	7.05	26.5	603	54.8
		5/5/09	6.91	28.1	682	43.9
		8/1/09	7.12	27.4	768	43.1
		11/10/09	6.96	27.0	692	49
		3/2/10	7.36	24.9	693	43.4
		3/2/2010 DUP	7.36	24.9	693	45.1
		4/9/10	6.17	25.6	556	48.1

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
HOBAN	805290	2/27/08	6.93	22.1	1359	510
		5/7/08	6.88	22.3	1532	670
		7/14/08	6.88	23.1	1719	690
		10/16/08	6.98	22.4	1624	692
		1/28/09	6.82	21.3	1220	580
		4/15/09	7.07	21.7	1423	700
		7/14/09	6.78	22.6	1551	670
		10/15/09	6.75	22.7	1487	670
		10/15/09 DUP	6.75	22.7	1487	780
		3/2/10	7.12	19.8	1575	580
HOWARD	NR	3/4/08	7.06	20.4	1280	571
		5/8/08	6.95	21.0	1494	673
		7/14/08	7.00	21.1	1566	610
		10/15/08	7.00	20.6	1598	683
		1/28/09	6.82	21.0	1203	640
		1/28/09 DUP	6.82	21.0	1203	640
		4/15/09	7.02	21.5	1397	620
		7/15/09	7.16	21.5	1539	640
		10/12/09	6.89	21.4	1414	600
		1/27/10	7.35	20.0	1714	440
		1/27/10 DUP	7.35	20.0	1714	520
		4/21/10	7.16	20.8	1490	710
KEEFER	209744	2/6/08	7.70	19.0	378	6.8
		5/6/08	7.19	20.3	512	9
		7/16/08	7.21	21.4	539	8
		10/28/08	7.32	20.1	534	21.2
		1/28/09	7.42	19.5	356	6.1
		4/16/09	7.29	20.0	452	7.7
		7/14/09	7.35	22.1	533	7
		10/13/09	7.24	20.7	516	8.7
		1/26/10	7.15	18.8	483	7.3
		4/20/10	7.44	20.5	540.9	8.77
MCCONNELL 265	539265	2/20/08	7.21	21.1	1435	720
		5/6/08	6.77	21.6	1668	737
		7/15/08	6.91	22.3	1775	700
		10/15/08	6.82	21.3	1686	703
		1/28/09	6.85	21	1274	660
		4/15/09	7.04	21.3	1472	657
		7/15/09	7.01	22.2	1607	662
		10/12/09	6.77	21.7	1594	666
		1/26/10	6.71	21.5	1641	685
		4/22/10	6.95	20.1	1691	811

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
METZLER	35-71891	3/5/08	7.27	21.6	1055	317
		5/15/08	7.12	22.8	1051	329
		7/31/08	7.16	22.5	1078	317
		10/20/08	7.24	22.2	1080	305
		10/20/08 DUP	7.24	22.2	1080	326
		2/11/09	7.12	21.3	818	321
		4/20/09	7.22	23.2	845	313
		7/15/09	7.41	22.9	1031	293
		7/15/09 DUP	7.41	22.9	1031	309
		10/14/09	7.1	22.7	989	315
		2/1/10	7.22	21.7	1021	286
		5/18/10	7.56	21.0	1053	330
MOORE	538847	2/20/08	7.69	22.2	362	7.1
		5/8/08	7.09	22.4	432	7.5
		7/16/08	7.34	23.0	482	9.8
		10/29/08	7.32	22.4	452	19.2
		1/29/09	7.11	21.7	328	6.6
		4/16/09	7.40	22.1	374	6.4
		7/15/09	7.44	23.3	439	5.8
		10/13/09	7.36	22.6	429	7.1
		1/26/10	7.54	19.6	423	6.3
		4/22/10	7.47	20.6	433	7.40
NESS	509127	7/24/08	7.35	26.5	563	50.2
		10/16/08	7.47	21.4	542	48.9
		1/26/09	7.39	17.2	422	52.3
		5/11/09	7.52	28.8	472	45.9
		8/11/09	7.56	28.7	525	39.8
		11/12/09	7.53	24.5	537	51.3
		2/2/10	7.67	19.7	535	48.7
		4/21/10	7.70	23.5	518.9	42.1
NOTEMAN	212483	2/5/08	6.70	19.9	1317	310
		5/13/08	6.67	23.0	1445	272
		7/24/08	6.68	24.2	1539	274
		10/23/08	6.57	23.2	1643	356
		1/19/09	6.38	22.9	1098	322
		4/7/09	6.56	23.8	1375	303
		7/8/09	6.55	24.6	1405	260
		10/5/09	6.48	24.1	1442	281
		1/20/10	6.79	20.3	1450	289
		4/19/10	6.81	22.4	1446	307
NSD-02	527587	2/5/08	ND	ND	ND	43
		7/7/08	8.02	21.0	609	44
NSD-03	527586	2/5/08	ND	ND	ND	70.7
		7/7/08	7.64	21.0	570	58.9
NWC-02	562944	10/27/08	7.47	22.2	438	5.1
		2/12/09	7.58	21.6	330	6.6
		4/23/09	7.39	23.8	373	6.4
		7/21/09	7.62	23.9	408	5
		10/21/09	7.32	22.6	436	6.8
		2/3/10	7.68	19.6	423	8.5
		4/21/10	7.57	22.1	413	7.26

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
NWC-03	203321	3/4/08	ND	ND	ND	560
		6/9/08	ND	ND	ND	524
		10/27/08	7.07	21.9	1374	489
		2/12/09	7.06	20.2	1023	412
		4/23/09	6.98	21.9	1129	466
		4/23/09 DUP	6.98	21.9	1129	460
		7/21/09	7.21	22.9	1194	458
		10/21/09	6.94	21.8	1224	444
		2/3/10	7.24	20.7	1214	444
		4/21/10	7.22	21.6	1178	433
NWC-04	551849	3/4/08	ND	ND	ND	240
		6/9/08	ND	ND	ND	231
		10/27/08	7.32	25.0	856	162
		1/22/09	7.23	22.9	688	184
		2/12/09	7.20	19.8	699	181
		2/12/09 DUP	7.20	19.8	699	198
		3/11/09	7.15	23.4	846	197
		4/23/09	7.21	24.1	797	188
		5/28/09	7.01	24.1	933	210
		6/24/09	6.93	25.6	792	169
		7/21/09	7.48	24.3	859	193
		8/19/09	7.12	24.5	906	183
		9/23/09	7.16	23.8	953	202
		10/21/09	7.18	24.3	875	191
		11/18/09	7.24	22.9	909	191
		12/16/09	7.28	22.3	926	193
		2/3/10	7.49	22.3	844	167
		3/8/10	7.33	22.5	880	182
		4/21/10	7.34	22.8	913	218
		5/18/10	7.68	25.8	901.3	210
		6/15/10	7.31	24.5	917.5	212
NWC-06	575700	3/4/08	ND	ND	ND	7.9
		6/9/08	ND	ND	ND	7.2
		10/27/08	7.35	23.3	414	6.4
		2/12/09	7.54	21.8	306	8
		4/23/09	7.30	24.5	354	7.3
		7/21/09	7.63	23.5	388	6.4
		10/21/09	7.26	23.2	413	8
		2/3/10	7.61	20.5	404	7.5
		2/3/10 DUP	7.61	20.5	404	7.4
		4/21/10	7.54	22.4	387	8.49

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
OSBORN	643436	2/25/08	7.35	22.4	508	16.4
		5/13/08	7.22	22.2	576	17.2
		7/22/08	7.24	22.9	618	17.7
		7/22/08 DUP	7.24	22.9	618	17.5
		10/16/08	7.39	22.4	595	15.9
		1/20/09	7.33	22.4	469	16
		4/7/09	7.25	24.0	542	17
		8/18/09	7.16	24.6	643	17.4
		10/5/09	7.14	22.9	599	17.9
		1/21/10	7.47	19.5	591	15.6
		4/19/10	7.60	21.5	601.9	19.3
PALMER	578819	2/14/08	7.91	17.5	435	15.9
		5/13/08	7.92	22.9	508	16.6
		7/22/08	7.64	25.8	548	16.2
		10/16/08	7.61	17.0	527	15.9
		1/20/09	7.33	19.4	441	14.3
		4/8/09	7.65	19.1	475	15.4
		7/8/09	7.47	27.2	521	14.3
		10/5/09	7.81	22.2	538	16.2
		1/20/10	7.72	11.9	510	13.8
		4/22/10	7.97	13.6	520	16.7
PANAGAKOS	35-76413	4/21/08	6.80	20.5	1228	410
		7/21/08	6.95	21.9	1390	444
		10/13/08	6.86	21.2	1386	480
		10/13/08 DUP	6.86	21.2	1386	500
		1/22/09	6.92	19.7	997	397
		4/9/09	6.81	21.7	1228	431
		4/9/09 DUP	6.81	21.7	1228	426
		7/9/09	6.89	22.3	1469	490
		10/6/09	6.83	21.1	1328	472
		1/21/10	7.06	18.8	1291	318
		4/20/10	7.25	21.0	1528	608
PARRA	576415	2/11/08	7.08	21.8	1067	360
		5/15/08	7.10	21.8	1200	405
		7/31/08	7.00	22.4	1248	423
		7/31/08 DUP	7.00	22.4	1248	404
		10/20/08	7.07	22.9	1246	387
		2/13/09	7.24	22.1	965	405
		4/20/09	7.10	22.6	971	372
		7/20/09	7.17	23.9	1174	375
		10/20/09	6.80	22.5	1188	388
		2/1/10	7.07	21.5	1197	353
		4/22/10	6.91	20.3	1219	417
PIONKE	613395	2/6/08	7.53	19.9	910	394
		5/7/08	7.08	21.4	1100	391
		7/17/08	6.99	21.9	1209	420
		10/27/08	7.03	20.8	1175	460
		1/29/09	7.13	19.9	847	385
		4/14/09	7.58	20.7	1053	411
		7/13/09	7.35	21.5	1165	472
		10/7/09	7.43	21.1	1100	403
		3/8/10	7.72	18.6	1201	406
		4/26/10	7.22	21.9	1224	438

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
POOL	509518	2/20/08	7.95	20.9	497	134
		5/19/08	7.40	22.2	585	122
		7/31/08	7.47	22.3	599	117
		10/21/08	7.51	21.4	598	120
		2/13/09	7.62	20.8	473	141
		4/21/09	7.73	22.6	470	124
		7/20/09	7.76	22.9	579	122
		10/20/09	7.22	21.2	577	122
		2/24/10	7.56	22.4	577	110
		4/22/10	7.75	20.2	606.5	130
POWER	624535	2/12/08	7.11	18.9	428	15.5
		7/22/08	7.10	21.7	795	20.2
RAMIREZ	216425	2/4/08	7.47	21.7	408	7.6
		5/6/08	7.19	22.7	405	8.3
		7/17/08	7.32	24.5	439	8.8
		10/27/08	7.41	22.2	412	7.3
		1/29/09	7.24	22.2	301	8.3
		4/16/09	7.49	22.4	344	7.6
		7/10/09	7.52	23.9	411	6.4
		10/6/09	7.30	23.8	388	8.4
		1/25/10	7.48	22.4	390	7.8
		4/21/10	7.45	22.6	397	9.04
RAY	803772	2/15/08	7.30	19.1	1540	159
		4/21/2008[1]	6.92	21.3	1418	125
		5/13/2008[1]	7.05	20.9	1418	123
		6/23/2008[1]	6.87	21.1	1593	130
		7/29/2008[1]	6.98	21.8	1411	120
		8/28/2008[1]	M	21.1	1519	129
		9/23/2008[1]	6.90	22.2	1519	125
		10/22/08	6.96	20.8	1604	145
		1/20/09	6.92	20.6	1355	88
		4/8/09	6.85	21.4	1759	178
		7/9/09	6.93	22.3	1434	126
		10/7/09	6.98	21.3	1288	127
		1/26/10	6.82	20.6	1352	125
		4/20/10	7.14	21.5	1318	134
ROGERS 803	641803	2/7/08	7.45	18.6	601	138
		4/21/2008[1]	7.32	21.4	552	128
		5/8/2008[1]	7.14	21.2	622	141
		6/23/2008[1]	7.06	22.9	660	129
		7/29/2008[1]	6.78	23.1	339	134
		8/28/2008[1]	7.18	21.6	635	128
		9/23/2008[1]	7.24	21.9	599	133
		10/22/08	7.36	21.3	650	144
		2/10/09	7.42	17.9	475	141
		4/29/09	7.52	21.9	506	211
		8/3/09	7.39	24.2	674	150
ROGERS 596[2]	573596	10/19/09	6.89	23.3	1360	590
		11/5/09	6.79	21.9	1418	540
		2/25/10	6.99	19.6	1603	520
		4/22/10	7.21	18.2	1641	710

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
ROGERS E	216018	2/4/08	7.40	21.0	435	4.6
		5/7/08	7.18	22.2	415	5.9
		7/17/08	7.28	23.0	446	7.1
		10/27/08	7.38	21.4	434	15.7
		2/10/09	7.51	20.7	322	5.4
		4/16/09	7.48	22.0	361	4.9
		7/13/09	7.34	22.6	420	3.8
		10/6/09	7.31	22.3	407	5.8
		1/25/10	7.52	20.6	414	5.1
		4/21/10	7.44	21.1	421	6.04
RUIZ	531770	2/5/08	7.73	18.2	445	263
		5/15/08	7.23	25.9	965	265
		7/30/08	6.99	22.1	999	243
		10/20/08	7.04	22.0	995	238
		2/12/09	6.94	20.9	748	254
		4/21/09	7.18	22.3	759	227
		8/3/09	7.05	22.9	1029	221
		10/28/09	7.09	20.6	920	227
		2/1/10	7.08	20.9	934	236
		4/26/10	7.01	22.5	920.1	240
SCHWARTZ	210865	2/8/08	7.52	21.5	506	158
		4/21/2008[1]	7.23	21.7	563	122
		5/19/2008[1]	7.38	22.4	629	130
		6/23/2008[1]	7.02	22.1	674	129
		7/29/2008[1]	7.25	22.4	955	245
		8/28/2008[1]	M	22.3	669	131
		9/23/2008[1]	7.27	22.2	607	124
		10/22/2008[1]	7.31	22.0	653	135
		11/19/2008[1]	7.38	21.1	612	140
		12/17/2008[1]	6.78	21.6	472	144
		1/29/2009[1]	7.08	22.0	475	124
		2/23/2009[1]	7.33	22.1	610	123
		4/17/09	7.46	22.2	520	120
		7/10/09	7.52	22.8	651	116
		7/10/09 DUP	7.52	22.8	651	117
		10/6/09	7.27	22.5	613	120
		1/22/10	7.79	19.5	664	133
		4/21/10	7.50	20.9	638	129
SRC	211345	4/23/08	7.57	25.8	380	19
		8/5/08	7.40	27.2	452	15.4
SWAN	NR	2/13/08	7.28	20.7	467	24.1
		5/14/08	7.24	21.2	479	23.7
		7/24/08	7.35	22.4	506	18
		10/16/08	7.32	20.7	488	19
		1/20/09	7.05	20.4	391	19.8
		4/7/09	7.21	21.5	447	19.9
		7/8/09	7.18	23.1	473	18.5
		10/5/09	7.18	21.4	496	19.7
		1/21/10	7.49	19.5	501	18.4
		4/21/10	7.42	20.3	512.1	20.9

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
TM-02A	522574	3/4/08	8.67	22.6	302	12.3
		5/23/08	7.75	22.9	321	14.7
		8/15/08	7.84	26.4	369	14.4
		10/30/08	8.07	23.9	375	21.9
		2/24/09	8.10	24.8	340	20.3
		5/6/09	8.06	26.7	320	18.7
		8/12/09	8.34	26.9	398	20
		11/4/09	8.16	26.3	381	21.8
		3/10/10	8.13	25.2	351	21.4
		3/10/10 DUP	8.13	25.2	351	21.3
		4/6/10	6.96	24.6	363	25.6
TM-03	522575	5/20/08	7.51	22.2	778	110
		8/6/08	7.08	21.6	828	97
		11/12/08	7.47	20.5	590	128
		2/26/09	7.21	21.8	737	107
		2/26/09 DUP	7.21	21.8	737	102
		5/13/09	7.47	22.2	695	109
		8/18/09	7.48	22.4	822	98
		11/10/09	7.55	21.8	761	106
		3/2/10	7.56	21.6	748	99
		4/14/10	7.55	20.6	635	103
TM-06 MILLER	522695	2/27/08	7.44	19.6	457	13.9
		5/20/08	7.50	20.7	506	32.7
		8/4/08	7.41	20.7	529	31.3
		10/29/08	7.55	20.2	531	34.5
		2/26/09	7.18	20.4	574	32.7
		5/13/09	7.35	20.9	465	30.6
		8/18/09	7.50	20.9	560	30.9
		8/18/09 DUP	7.50	20.9	560	29.9
		11/12/09	7.53	20.4	530	31.1
		4/14/10	7.35	19.4	461	29.0
TM-07	522576	3/6/08	7.54	20.8	726	22.5
		5/22/08	6.96	20.1	385	22.9
		8/6/08	7.04	22.8	519	22.2
		11/4/08	7.76	20.6	347	31.2
		2/20/09	7.77	19.9	376	22.5
		5/13/09	7.30	22.9	559	130
		8/17/09	7.60	22.6	442	134
		11/3/09	7.85	21.8	441	134
		3/2/10	7.67	21.6	422	124
		5/25/10	7.77	21.2	398	42.6
TM-08 SWAN	522817	2/13/08	7.63	24.1	511	24.1
		5/14/08	7.44	24.4	480	12.6
		7/23/08	7.76	28.1	522	12.6

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
TM-15 MILLER	522699	2/27/08	7.66	21.9	344	14
		5/23/08	7.54	22.1	371	14.4
		8/5/08	7.42	23.3	413	13.7
		10/28/08	7.63	22.6	387	18.6
		10/28/08 DUP	7.63	22.6	387	18.8
		2/26/09	7.57	22.0	373	14.6
		5/13/09	7.61	23.1	344	13.7
		8/17/09	7.73	23.2	398	14.2
		11/3/09	7.73	23.4	414	14.8
		2/24/10	7.66	22.8	381	14.4
		4/27/10	7.71	23.0	383.6	14.9
TM-16	522578	3/5/08	7.17	20.6	1351	497
		5/22/08	7.05	20.5	1304	522
		8/6/08	6.67	20.9	1410	466
		11/5/08	7.14	19.8	1162	547
		2/20/09	6.90	21.1	1292	492
		5/13/09	6.93	21.1	1179	484
		8/19/09	7.08	21.2	1354	468
		11/10/09	7.02	21.0	1310	505
		3/2/10	7.13	20.4	1313	451
		4/14/10	6.90	19.9	987	484
TM-19A	522581	3/6/08	8.02	22.2	240	56.1
		5/22/08	7.36	24.0	501	64.5
		8/6/08	7.32	22.6	494	55.3
		11/18/08	7.79	24.3	365	66.3
		3/3/09	7.41	24.5	489	66.2
		4/22/09	7.44	24.3	494	62.5
		8/12/09	7.61	24.4	554	61.3
		11/4/09	7.47	24.2	522	63
		3/10/10	7.54	22.9	511	60.6
		4/9/10	6.49	23.0	435	66.5
TM-42	562554	3/5/08	7.10	20.8	1342	482
		5/22/08	7.05	21.4	1270	483
		8/6/08	6.69	22.0	1388	467
		11/6/08	6.90	21.0	1025	477
		2/18/09	6.72	22.3	1245	429
		5/7/09	6.88	24.5	1155	430
		5/7/09 DUP	6.88	24.5	1155	445
		8/18/09	7.04	24.4	1336	428
		11/3/09	7.07	23.1	1266	430
		2/24/10	7.13	22.7	1236	390
		4/19/10	6.87	21.5	985	444
TM-43	564729	3/3/08	8.57	21.0	341	2.1
		8/4/08	8.14	25.7	436	<5
TM-43A	564726	3/3/08	6.17	19.9	2788	1420
		8/4/08	6.03	21.6	3149	1320
		3/3/08	6.79	20.6	514	0.7
		8/5/08	6.89	21.0	507	31.8
		8/5/08 DUP	6.89	21.0	507	32.5

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
TVI 236	802236	3/20/08	7.48	20.0	488	31.3
		5/7/08	7.13	20.4	494	32.6
		7/15/08	7.39	21.9	532	37.6
		10/15/08	7.45	22.3	490	36.6
		2/11/09	7.32	20.1	391	27.6
		4/17/09	7.36	19.3	418	28.1
		4/17/09 DUP	7.36	19.3	418	28.3
		7/21/09	7.59	22.9	484	31.3
		10/19/09	7.31	22.1	513	33.2
		2/2/10	7.39	20.4	497	26
		4/23/10	7.46	20.0	504.6	30.9
TVI 875	568875	2/21/08	7.28	21.1	739	244
		5/7/08	7.09	21.2	833	250
		7/15/08	7.27	22.4	925	274
		10/15/08	7.26	22.1	878	245
		2/11/09	7.20	20.7	738	312
		4/17/09	7.31	21.5	690	251
		7/21/09	7.47	22.2	812	236
		10/19/09	7.23	21.9	822	247
		2/2/10	7.32	20.8	939	250
		4/23/10	7.34	20.2	930.4	294
WALKER	200393	2/13/08	7.05	20.2	650	20
		7/23/08	7.25	20.7	740	45.4
WEED	544535	2/14/08	7.74	21.7	323	11.1
		5/15/08	7.22	22.7	365	12.6
		7/30/08	7.42	32.0	407	11.5
		10/20/08	8.10	31.6	405	10.2
		2/13/09	7.66	21.0	303	12.6
		4/22/09	7.46	22.2	368	11.6
		7/16/09	7.50	21.9	365	10.8
		10/20/09	7.34	21.6	381	12.7
		2/1/10	7.60	20.8	382	12.2
		4/26/10	7.69	22.1	366	13.4
WEISKOPF	641802	2/15/08	7.48	20.0	1072	500
		5/7/08	7.10	21.8	1251	483
		7/16/08	7.07	22.2	1399	560
		10/28/08	6.98	20.8	1401	602
		1/29/09	6.79	20.7	1014	503
		4/15/09	7.53	21.1	1164	503
		7/15/09	7.84	22.1	1317	486
		10/15/09	6.89	21.4	1216	484
		2/2/10	7.22	20.4	1319	451
		4/22/10	7.30	19.3	1329	572

Table 2
Compilation of Analytical Results
For Sulfate and Field Parameters

Well Name	ADWR 55 Registry No.	Sample Date	pH (SU)	Temp (deg C)	SC (µS/cm)	Sulfate, dissolved (mg/L)
ZANDER	205126	2/4/08	7.24	19.7	392	5.7
		5/6/08	7.26	21.2	404	6.3
		7/16/08	6.92	22.9	441	6.9
		10/28/08	7.40	21.2	415	15
		2/10/09	7.50	20.4	317	6
		4/16/09	7.47	21.7	352	5.5
		7/14/09	7.36	22.9	418	4.5
		10/13/09	7.41	21.7	407	6.3
		1/26/10	7.49	20.3	411	5.7
		4/2/10	7.55	20.0	416	6.70

deg C = degrees Celsius

M = pH Meter Malfunction

NA = Not Analyzed

NR = No Record

ND = No Data

SC = Specific Conductance

SU = Standard Units

µS/cm = microsiemens per centimeter

[1] Verified drinking water supply well, sample collected for sulfate trend analysis and interim action evaluation

[2] Well Previousely identified as ROGERS 803

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
ANDERSON	613396	601134.729	3468816.065	4580.34	3/20/08	145.46	4434.88
					5/5/08	145.84	4434.50
					7/14/08	146.16	4434.18
					10/15/08	146.21	4434.13
					1/27/09	145.97	4434.37
					4/14/09	146.21	4434.13
					7/14/09	146.88	4433.46
					10/12/09	147.31	4433.03
					1/27/10	147.31	4433.03
					4/21/10	147.57	4432.77
AWC-02	616586	598907.911	3468549.357	4547.64	8/27/08	121.12	4426.52
					4/8/08[2]	116	4431.64
					10/23/08[3]	115	4432.64
					4/22/09[3]	118	4429.64
					10/9/09[3]	117	4430.64
					4/23/10[3]	119	4428.64
AWC-03	616585	599090.322	3468681.898	4539.52	8/27/08	119.40	4420.12
					4/8/2008[2]	112	4427.52
					10/23/08[3]	106	4433.52
					4/22/09[3]	114	4425.52
					10/9/09[3]	116	4423.52
					4/23/10[3]	116	4423.52
AWC-04	616584	598949.929	3468717.084	4540.48	8/18/08	112.56	4427.92
					4/8/2008[2]	108	4432.48
					10/23/08[3]	111.31	4429.17
					4/22/09[3]	110	4430.48
					10/9/09[3]	110	4430.48
					4/23/10[3]	109	4431.48
AWC-05	590620	599269.904	3468541.692	4542.51	8/27/08	299.65	4242.86
					4/8/08	284	4258.51
					10/23/08	284	4258.51
					4/22/09	286	4256.51
					6/3/09	125	4417.51
					10/9/09[3]	289	4253.51
					4/23/10[3]	278	4264.51
BANKS 987	647987	606981.921	3469206.175	4648.18	2/27/08	208.00	4440.18
					5/12/08	216.30	4431.88
					7/21/08	228.95	4419.23
					10/13/08	228.20	4419.98
					1/21/09	206.64	4441.54
					4/8/09	205.50	4442.68
					7/9/09	235.68	4412.50
					10/7/09	236.71	4411.47
					2/25/10	216.98	4431.20
					4/20/10	219.35	4428.83
BARTON 919	644919	606243.850	3469076.689	4692.36	5/12/08	113.71	4578.65
					7/23/08	113.56	4578.80
					10/16/08	113.20	4579.16
					3/11/09	112.92	4579.44
					4/10/09	112.89	4579.47
					7/7/09	112.86	4579.50

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
BF-01	539783	604169.077	3472151.593	4835.23	3/4/08	348.99	4486.24
					5/23/08	348.80	4486.43
					8/5/08	348.66	4486.57
					11/5/08	348.94	4486.29
					2/20/09	348.78	4486.45
					5/6/09	348.73	4486.50
					8/17/09	348.73	4486.50
					11/4/09	348.65	4486.58
					3/1/10	348.84	4486.39
					4/7/10	348.70	4486.53
BIMA	577927	606001.245	3471852.804	4802.05	5/13/08	367.31	4434.74
					8/18/08	370.24	4431.81
					10/23/08	353.96	4448.09
					1/20/09	353.07	4448.98
					4/7/09	357.76	4444.29
					7/8/09	365.44	4436.61
					10/5/09	370.11	4431.94
					4/19/10	382.25	4419.80
BMO-2008-1G	909474	606467.681	3471723.644	4805.10	8/27/08	62.05	4743.05
					11/11/08	60.95	4744.15
					2/25/09	61.43	4743.67
					4/28/09	62.01	4743.09
					8/4/09	62.96	4742.14
					10/27/09	63.61	4741.49
					2/17/10	64.51	4740.59
					4/15/10	65.05	4740.05
BMO-2008-3B	909147	602012.923	3467919.582	4583.97	7/18/08	138.05	4445.92
					11/4/08	137.95	4446.02
					2/19/09	138.19	4445.78
					5/11/09	138.46	4445.51
					8/6/09	139.02	4444.95
					10/26/09	139.60	4444.37
					3/3/10	140.03	4443.94
					4/8/10	140.07	4443.90
BMO-2008-4B	910096	601099.405	3468383.430	4573.17	12/11/08	130.77	4442.40
					2/18/09	130.58	4442.59
					4/30/09	131.24	4441.93
					8/6/09	131.96	4441.21
					10/27/09	132.04	4441.13
					2/24/10	131.82	4441.35
					4/16/10	132.65	4440.52
BMO-2008-5B	909653	600438.159	3468994.715	4585.10	9/30/08	145.10	4440.00
					2/18/09	144.35	4440.75
					4/27/09	144.78	4440.32
					8/4/09	145.36	4439.74
					10/29/09	145.88	4439.22
					2/15/10	145.42	4439.68
					4/15/10	145.80	4439.30

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
BMO-2008-5M	909552	600445.071	3468994.282	4585.02	10/2/08	146.65	4438.37
					2/18/09	145.97	4439.05
					4/27/09	146.46	4438.56
					8/4/09	147.13	4437.89
					10/29/09	147.68	4437.34
					2/15/10	147.07	4437.95
					4/16/10	147.34	4437.68
BMO-2008-6B	909146	600366.523	3469820.644	4627.44	7/16/08	190.13	4437.31
					11/4/08	190.23	4437.21
					2/19/09	189.71	4437.73
					4/27/09	189.99	4437.45
					8/4/09	190.80	4436.64
					10/26/09	191.04	4436.40
					2/15/10	190.82	4436.62
					4/15/10	190.75	4436.69
BMO-2008-6M	909019	600367.943	3469813.885	4626.90	7/10/08	191.63	4435.27
					11/4/08	190.25	4436.65
					2/20/09	190.70	4436.20
					4/28/09	190.98	4435.92
					8/4/09	191.77	4435.13
					10/26/09	192.14	4434.76
					2/15/10	191.78	4435.12
					4/15/10	191.64	4435.26
BMO-2008-7M	908794	603099.165	3470029.283	4688.33	7/14/08	238.31	4450.02
					11/6/08	239.69	4448.64
					2/18/09	238.90	4449.43
					5/11/09	239.03	4449.30
					8/6/09	239.17	4449.16
					10/27/09	239.55	4448.78
					2/17/10	239.98	4448.35
					4/15/10	240.13	4448.20
BMO-2008-8B	910097	604171.347	3471141.719	4753.25	12/5/08	297.94	4455.31
					2/19/09	297.63	4455.62
					5/5/09	297.37	4455.88
					8/10/09	297.53	4455.72
					11/9/09	297.85	4455.40
					3/3/10	298.37	4454.88
					4/16/10	298.46	4454.79
BMO-2008-8M	909711	604167.912	3471127.902	4752.45	12/9/08	299.79	4452.66
					2/19/09	298.32	4454.13
					5/5/09	298.27	4454.18
					8/10/09	298.57	4453.88
					11/5/09	298.81	4453.64
					3/3/10	299.18	4453.27
					4/16/10	299.42	4453.03

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
BMO-2008-9M	909255	604668.669	3471121.675	4762.61	8/8/08	287.17	4475.44
					11/5/08	287.65	4474.96
					2/26/09	285.65	4476.96
					5/12/09	285.28	4477.33
					8/17/09	286.09	4476.52
					11/3/09	286.55	4476.06
					3/4/10	287.45	4475.16
					4/6/10	287.81	4474.80
BMO-2008-10GL	909435	605264.072	3471702.043	4792.21	8/20/08	521.75	4270.46
					11/5/08	520.50	4271.71
					2/25/09	516.72	4275.49
					5/12/09	514.68	4277.53
					8/11/09	513.23	4278.98
					11/2/09	509.43	4282.78
					3/4/10	510.88	4281.33
					4/8/10	506.31	4285.90
BMO-2008-10GU	909272	605267.551	3471731.866	4793.45	8/4/08	299.28	4494.17
					11/5/08	295.89	4497.56
					2/25/09	289.84	4503.61
					5/6/09	289.35	4504.10
					8/11/09	289.09	4504.36
					11/2/09	289.77	4503.68
					3/10/10	289.58	4503.87
					4/7/10	289.5	4503.95
BMO-2008-11G	909434	603800.995	3472626.482	4844.67	8/22/08	577.76	4266.91
					11/12/08	576.80	4267.87
					2/26/09	575.91	4268.76
					4/8/09	575.46	4269.21
					8/12/09	574.84	4269.83
					11/9/09	573.41	4271.26
					3/1/10	573.68	4270.99
					4/9/10	573.56	4271.11
BMO-2008-13B	909551	601657.612	3470076.358	4649.21	10/3/08	206.42	4442.79
					2/17/09	206.11	4443.10
					5/6/09	206.32	4442.89
					8/5/09	206.79	4442.42
					10/28/09	207.08	4442.13
					2/16/10	207.26	4441.95
					4/14/10	207.27	4441.94
BMO-2008-13M	909760	601650.495	3470040.455	4647.15	12/3/08	206.00	4441.15
					2/17/09	208.74	4438.41
					4/29/09	208.53	4438.62
					8/5/09	208.85	4438.30
					10/28/09	208.91	4438.24
					2/16/10	209.16	4437.99
					4/13/10	209.20	4437.95
BURKE	212268	602230.087	3473029.816	4856.30	4/22/08	606.55	4249.75
					8/5/08	605.86	4250.44
					10/28/08	604.88	4251.42
					2/19/09	603.91	4252.39
					4/28/09	603.70	4252.60
					8/19/09	602.66	4253.64

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
COB MW-1	903992	603153.259	3469889.889	4683.26	2/22/08	232.47	4450.79
					5/20/08	233.12	4450.14
					7/30/08	233.37	4449.89
					10/23/08	233.62	4449.64
					2/12/09	234.05	4449.21
					4/21/09	234.99	4448.27
					7/22/09	234.34	4448.92
					10/22/09	234.69	4448.57
					2/4/10	235.15	4448.11
					4/20/10	235.47	4447.79
COB MW-2	903984	600973.257	3468114.836	4566.21	2/22/08	122.85	4443.36
					5/20/08	123.00	4443.21
					7/30/08	123.53	4442.68
					10/23/08	124.02	4442.19
					2/12/09	123.39	4442.82
					4/23/09	124.16	4442.05
					7/22/09	124.91	4441.30
					10/22/09	125.33	4440.88
					3/3/10	124.93	4441.28
					4/26/10	125.47	4440.74
COB MW-3	906823	599169.225	3468726.000	4538.63	2/28/08	120.84	4417.79
					5/20/08	125.00	4413.63
					7/30/08	118.50	4420.13
					10/23/08	117.93	4420.70
					2/12/09	110.91	4427.72
					4/23/09	125.13	4413.50
					7/22/09	124.09	4414.54
					10/22/09	118.03	4420.60
					3/3/10	120.14	4418.49
					4/26/10	123.12	4415.51
COB WL	593116	606357.506	3472502.012	4832.06	2/22/08	56.50	4775.56
					5/20/08	57.50	4774.56
					7/30/08	58.64	4773.42
					10/23/08	58.76	4773.30
					2/12/09	58.89	4773.17
					4/23/09	59.73	4772.33
					7/22/09	61.27	4770.79
					10/22/09	62.82	4769.24
					3/3/10	65.24	4766.82
					4/26/10	66.13	4765.93
COLLINS	565260	602551.286	3471341.335	4733.72	2/12/08	289.47	4444.25
					5/29/08	288.53	4445.19
					7/31/08	290.08	4443.64
					10/20/08	290.15	4443.57
					4/21/09	290.66	4443.06
					7/20/09	290.78	4442.94
					10/20/09	290.52	4443.20
					2/2/10	291.64	4442.08
					4/23/10	291.96	4441.76

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
COOPER C	637069	601349.987	3468913.011	4595.06	3/4/08	155.08	4439.98
					5/5/08	155.34	4439.72
					7/15/08	156.01	4439.05
					10/16/08	155.85	4439.21
					1/27/09	155.62	4439.44
					4/14/09	155.86	4439.20
					7/14/09	156.50	4438.56
					10/12/09	156.89	4438.17
					1/27/10	157.03	4438.03
					4/22/10	157.31	4437.75
DODSON	644927	605594.560	3469063.772	4686.34	5/12/08	81.38	4604.96
					7/24/08	82.20	4604.14
					10/13/08	81.82	4604.52
					1/22/09	82.33	4604.01
					4/9/09	82.84	4603.50
					7/8/09	86.88	4599.46
					10/6/09	87.27	4599.07
					1/21/10	88.54	4597.80
					4/19/10	89.53	4596.81
DOUGLASS 791	592791	607632.993	3470222.677	4703.27	2/13/08	22.11	4681.16
					5/13/08	24.60	4678.67
					7/22/08	27.00	4676.27
					10/16/08	23.60	4679.67
					1/19/09	26.51	4676.76
					4/8/09	28.53	4674.74
					7/7/09	31.04	4672.23
					10/5/09	31.49	4671.78
					1/21/10	34.55	4668.72
					4/19/10	36.40	4666.87
DOUGLASS 792	592792	607607.541	3469829.115	4681.73	2/13/08	87.76	4593.97
					5/13/08	87.21	4594.52
					7/22/08	86.90	4594.83
					10/16/08	86.45	4595.28
					1/20/09	86.26	4595.47
					4/8/09	86.04	4595.69
					7/7/09	86.16	4595.57
					10/5/09	86.19	4595.54
					1/21/10	86.45	4595.28
					4/19/10	87.19	4594.54
EAST	599796	607076.365	3468712.215	4626.01	2/8/08	50.20	4575.81
					5/14/08	52.45	4573.56
					7/23/08	52.16	4573.85
					10/14/08	52.19	4573.82
					1/20/09	50.52	4575.49
					4/8/09	51.91	4574.10
					7/13/09	56.93	4569.08
					10/8/09	60.95	4565.06
					1/25/10	59.35	4566.66
					4/21/10	58.88	4567.13

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
EPPELE 641	805641	607165.354	3469229.942	4642.86	3/11/08	29.52	4613.34
					5/12/08	30.64	4612.22
					7/21/08	25.59	4617.27
					10/14/08	24.53	4618.33
					1/21/09	27.35	4615.51
					4/8/09	29.08	4613.78
					7/9/09	31.51	4611.35
					10/7/09	29.92	4612.94
FLEMING	218386	605565.701	3469342.523	4693.68	2/18/09	299.30	4394.38
					4/8/09	301.81	4391.87
					7/7/09	304.60	4389.08
					10/6/09	307.84	4385.84
					1/21/10	311.73	4381.95
					4/20/10	315.26	4378.42
FULTZ	212447	607153.306	3469063.892	4642.92	10/22/08	40.59	4602.33
					1/21/09	40.66	4602.26
					4/9/09	42.88	4600.04
					7/13/09	54.94	4587.98
					10/8/09	56.16	4586.76
					1/25/10	53.45	4589.47
					4/20/10	63.82	4579.10
GARNER 557	558557	602659.240	3468962.415	4626.44	2/21/08	191.05	4435.39
					5/5/08	191.28	4435.16
					7/15/08	191.44	4435.00
					10/16/08	191.83	4434.61
					1/28/09	191.92	4434.52
					4/15/09	192.09	4434.35
					7/16/09	192.52	4433.92
					10/14/09	192.82	4433.62
					2/2/10	193.33	4433.11
					4/22/10	193.49	4432.95
GARNER 635	587635	602665.352	3468967.902	4628.29	2/4/08	193.20	4435.09
					5/5/08	195.90	4432.39
					7/15/08	193.58	4434.71
					10/15/08	194.35	4433.94
					1/28/09	194.80	4433.49
					4/15/09	195.54	4432.75
					7/16/09	194.88	4433.41
					10/14/09	196.36	4431.93
					2/2/10	195.32	4432.97
					4/22/10	196.01	4432.28
GGOOSE 547	628547	606256.657	3469820.260	4717.11	5/21/08	220.91	4496.20
					8/15/08	238.48	4478.63
					10/29/08	235.90	4481.21
					2/24/09	236.13	4480.98
					5/14/09	236.17	4480.94
					8/19/09	236.01	4481.10
					8/19/09	236.01	4481.10
					11/11/09	237.66	4479.45
					3/9/10	238.84	4478.27
					4/27/10	239.17	4477.94

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
GL-03	539782	604386.940	3473747.943	4924.31	5/22/08	660.15	4264.16
					8/4/08	659.79	4264.52
					12/2/08	658.25	4266.06
					2/26/09	658.62	4265.69
					5/5/09	657.23	4267.08
					8/12/09	656.56	4267.75
					8/12/09	656.56	4267.75
					11/10/09	655.31	4269.00
					3/2/10	655.52	4268.79
					4/9/10	655.35	4268.96
GOAR RANCH	610695	602454.751	3468892.471	4631.13	2/21/08	183.90	4447.23
					5/5/08	188.11	4443.02
					7/16/08	184.41	4446.72
					10/22/08	184.68	4446.45
					1/27/09	184.87	4446.26
					4/15/09	184.96	4446.17
					7/7/09	185.36	4445.77
					10/12/09	185.72	4445.41
					2/2/10	186.25	4444.88
					4/22/10	186.44	4444.69
HOBAN	805290	601705.848	3468880.329	4597.21	2/27/08	163.05	4434.16
					5/7/08	163.28	4433.93
					7/14/08	163.87	4433.34
					10/16/08	163.95	4433.26
					1/28/09	163.82	4433.39
					4/15/09	164.16	4433.05
					7/14/09	164.59	4432.62
					10/15/09	165.00	4432.21
					3/2/10	165.32	4431.89
					5/18/10	165.71	4431.50
HOWARD	NR	601281.936	3468768.622	4589.70	3/4/08	150.10	4439.60
					5/8/08	150.70	4439.00
					7/14/08	150.91	4438.79
					10/15/08	150.67	4439.03
					1/28/09	150.67	4439.03
					4/15/09	151.15	4438.55
					7/15/09	151.76	4437.94
					10/12/09	152.08	4437.62
					1/27/10	152.20	4437.50
					4/21/10	152.30	4437.40
KEEFER	209744	599879.175	3468119.015	4572.03	2/6/08	134.67	4437.36
					5/6/08	135.28	4436.75
					7/16/08	136.24	4435.79
					10/28/08	135.87	4436.16
					1/28/09	134.88	4437.15
					4/16/09	135.00	4437.03
					7/14/09	136.07	4435.96
					10/13/09	136.67	4435.36
					1/26/10	136.26	4435.77
					4/20/10	136.26	4435.77

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
MCCONNELL 265	539265	601463.094	3468840.139	4600.70	2/20/08	156.15	4444.55
					5/6/08	156.40	4444.30
					7/15/08	157.07	4443.63
					11/19/08	157.17	4443.53
					1/28/09	156.70	4444.00
					4/15/09	157.22	4443.48
					7/15/09	157.59	4443.11
					10/12/09	158.13	4442.57
					1/26/10	158.35	4442.35
					4/22/10	158.68	4442.02
METZLER	35-71891	602091.308	3471381.176	4728.53	3/5/08	288.30	4440.23
					5/15/08	286.53	4442.00
					7/31/08	286.82	4441.71
					10/20/08	287.09	4441.44
					2/11/09	287.74	4440.79
					4/20/09	287.47	4441.06
					7/15/09	287.58	4440.95
					10/14/09	287.99	4440.54
					2/1/10	288.38	4440.15
					5/18/10	288.65	4439.88
NESS	509127	607866.391	3471419.494	4761.23	7/24/08	557.90	4203.33
					10/16/08	549.30	4211.93
					2/25/09	536.40	4224.83
					5/11/09	544.64	4216.59
					8/11/09	566.87	4194.36
					11/12/09	537.34	4223.89
					2/2/10	531.85	4229.38
					4/21/10	568.11	4193.12
NOTEMAN	212483	606053.800	3471576.400	4800.68	5/13/08	339.77	4460.91
					8/27/08	344.34	4456.34
					11/22/08	322.26	4478.42
					2/25/09	327.54	4473.14
NSD-02	527587	598820.051	3468821.474	4531.38	10/7/09	101.17	4430.21
					3/16/10	99.43	4431.95
					5/25/10	101.63	4429.75
NSD-03	527586	598070.538	3468694.259	4518.28	10/7/09	85.62	4432.66
					3/16/10	83.51	4434.77
					5/25/10	84.49	4433.79
NWC-02	562944	600177.435	3467474.673	4600.44	10/27/08	160.51	4439.93
					4/29/09[4]	160.5	4439.94
					9/10/09[4]	155	4445.44
					10/9/09[4]	155	4445.44
NWC-03	203321	601153.857	3468350.838	4574.99	11/3/08	131.48	4443.51
					4/29/09[4]	130	4444.99
					9/10/09[4]	126	4448.99
					10/9/09[4]	125	4449.99
NWC-03 CAP	627684	601151.704	3468343.653	4572.82	2/2/09	130.03	4442.79
					4/23/09[5]	130.62	4442.20
					7/21/09	131.26	4441.56
					10/21/09	131.60	4441.22
					2/3/10	131.34	4441.48
					4/21/10	131.86	4440.96

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Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
NWC-04	551849	605829.808	3469071.959	4690.77	12/2/08	352.11	4338.66
					4/29/09[4]	328	4362.77
					9/10/09[4]	324	4366.77
NWC-06	575700	599822.821	3467749.954	4592.50	4/29/09[4]	156	4436.50
					9/10/09[4]	155	4437.50
					10/9/09[4]	148	4444.50
OSBORN	643436	607031.823	3470270.548	4711.95	5/13/08	68.65	4643.30
					8/5/08	69.53	4642.42
					10/16/08	69.83	4642.12
					1/20/09	69.23	4642.72
					4/7/09	69.60	4642.35
					7/8/09	96.61	4615.34
					10/5/09	75.09	4636.86
					1/21/10	75.37	4636.58
					4/19/10	81.59	4630.36
PANAGAKOS	35-76413	605304.234	3469323.140	4691.40	1/22/09	155.28	4536.12
					4/9/09	156.15	4535.25
					7/9/09	161.61	4529.79
					10/6/09	167.20	4524.20
					1/21/10	166.92	4524.48
					4/20/10	167.11	4524.29
PARRA	576415	602170.716	3471263.549	4727.21	5/15/08	279.78	4447.43
					8/18/08	280.06	4447.15
					11/3/08	280.39	4446.82
					2/13/09	280.75	4446.46
					4/28/09	280.88	4446.33
					7/20/09	280.99	4446.22
PIONKE	613395	601045.471	3468960.981	4592.13	7/17/08	149.88	4442.25
					11/3/08	150.99	4441.14
					2/25/09	149.68	4442.45
					4/14/09	150.01	4442.12
					7/13/09	150.47	4441.66
					10/7/09	150.96	4441.17
					3/8/10	151.11	4441.02
					4/26/10	151.32	4440.81
POOL	509518	599683.603	3470013.823	4639.09	2/20/08	204.22	4434.87
					5/19/08	204.72	4434.37
					7/31/08	205.56	4433.53
					10/21/08	205.06	4434.03
					2/13/09	204.74	4434.35
					4/21/09	204.87	4434.22
					7/20/09	205.69	4433.40
					10/20/09	206.06	4433.03
					2/24/10	205.59	4433.50
					4/22/10	205.48	4433.61
RAMIREZ	216425	599730.649	3467584.363	4596.61	10/27/08	159.45	4437.16
					1/29/09	158.74	4437.87
					4/16/09	158.66	4437.95
					7/10/09	159.64	4436.97
					10/6/09	160.36	4436.25
					1/25/10	160.10	4436.51
					4/21/10	159.96	4436.65

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Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
RAY	803772	607083.422	3469195.147	4647.91	2/15/08	40.85	4607.06
					5/13/08	43.82	4604.09
					7/29/08	45.25	4602.66
					10/22/08	44.54	4603.37
					1/20/09	44.31	4603.60
					4/8/09	44.68	4603.23
					7/9/09	48.99	4598.92
					10/7/09	49.87	4598.04
					1/26/10	47.61	4600.30
					4/20/10	49.78	4598.13
ROGERS 596	573596	601001.503	3468491.639	4577.35	11/11/09	135.46	4441.89
					2/25/10	135.89	4441.46
					4/22/10	135.62	4441.73
ROGERS 750[6]	641750	600977.690	3468417.386	4579.02	2/7/08	129.85	4449.17
					7/29/08	131.86	4447.16
					10/22/08	132.08	4446.94
					2/10/09	130.62	4448.40
					4/29/09	131.33	4447.69
					8/3/09	135.07	4443.95
ROGERS E	216018	600449.648	3467636.029	4590.66	7/17/08	149.65	4441.01
					11/3/08	150.15	4440.51
					2/10/09	149.02	4441.64
					4/16/09	149.53	4441.13
					7/13/09	150.31	4440.35
					10/6/09	150.76	4439.90
					1/25/10	150.64	4440.02
					4/21/10	150.97	4439.69
RUIZ	531770	602857.357	3471424.219	4735.18	2/5/08	293.29	4441.89
					5/15/08	293.57	4441.61
					7/30/08	293.86	4441.32
					10/20/08	294.18	4441.00
					2/12/09	294.62	4440.56
					4/21/09	294.66	4440.52
					8/3/09	294.98	4440.20
					10/28/09	295.33	4439.85
					2/1/10	295.70	4439.48
					4/26/10	295.96	4439.22
SCHWARTZ	210865	600811.529	3468268.057	4551.58	2/8/08	121.80	4429.78
					5/19/08	123.49	4428.09
					7/29/08	122.64	4428.94
					10/22/08	123.39	4428.19
					1/29/09	122.87	4428.71
					4/17/09	123.53	4428.05
					7/10/09	124.15	4427.43
					10/6/09	124.55	4427.03
					1/22/10	124.32	4427.26
					4/21/10	124.65	4426.93

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
STEPHENS	808560	606981.766	3469072.799	4651.22	5/13/08	44.94	4606.28
					8/5/08	46.61	4604.61
					10/16/08	46.60	4604.62
					1/21/09	47.19	4604.03
					4/8/09	48.45	4602.77
					7/7/09	49.41	4601.81
					10/7/09	50.33	4600.89
					1/26/10	51.13	4600.09
					4/20/10	51.24	4599.98
SUNBELT	201531	605998.250	3471735.149	4806.52	2/6/08	352.10	4454.42
					5/15/08	358.97	4447.55
					8/5/08	Dry	<4426
					10/16/08	347.00	4459.52
					1/21/09	344.78	4461.74
					4/10/09	349.64	4456.88
					7/8/09	356.99	4449.53
					10/5/09	Dry	<4426
					1/21/10	Dry	<4426
					4/19/10	Dry	<4426
SWAN	NR	607378.547	3470648.298	4716.59	2/13/08	26.50	4690.09
					5/14/08	30.69	4685.90
					7/24/08	32.06	4684.53
					10/16/08	27.53	4689.06
					1/20/09	29.77	4686.82
					4/7/09	31.47	4685.12
					7/8/09	33.61	4682.98
					10/5/09	35.12	4681.47
					1/21/10	36.64	4679.95
					4/21/10	38.06	4678.53
TM-02A	522574	604152.059	3472008.794	4808.43	3/4/08	346.62	4461.81
					5/23/08	346.16	4462.27
					8/15/08	353.91	4454.52
					10/30/08	349.45	4458.98
					2/24/09	348.64	4459.79
					5/6/09	349.38	4459.05
					8/12/09	349.13	4459.30
					11/4/09	348.97	4459.46
					3/10/10	348.19	4460.24
					4/6/10	353.86	4454.57
TM-03	522575	606366.130	3473711.046	4897.85	3/12/08	127.14	4770.71
					5/20/08	127.40	4770.45
					8/6/08	128.02	4769.83
					11/12/08	128.00	4769.85
					2/26/09	126.94	4770.91
					5/13/09	113.86	4783.99
					8/18/09	128.80	4769.05
					11/10/09	125.38	4772.47
					3/2/10	128.02	4769.83
					4/14/10	130.56	4767.29

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
TM-06 MILLER	522695	606055.975	3468376.658	4707.88	2/26/08	158.78	4549.10
					5/20/08	158.76	4549.12
					8/4/08	158.80	4549.08
					10/29/08	158.85	4549.03
					2/16/09	159.28	4548.60
					5/13/09	158.81	4549.07
					8/18/09	158.91	4548.97
					11/12/09	158.96	4548.92
					3/8/10	158.99	4548.89
					4/14/10	159.02	4548.86
TM-16	522578	605588.075	3469842.199	4717.71	3/5/08	81.00	4636.71
					5/22/08	81.24	4636.47
					8/6/08	81.65	4636.06
					11/5/08	81.75	4635.96
					2/26/09	81.88	4635.83
					5/13/09	82.01	4635.70
					8/19/09	82.37	4635.34
					11/10/09	82.83	4634.88
					3/2/10	83.09	4634.62
					4/14/10	83.22	4634.49
TM-19A	522581	602458.710	3469197.426	4645.87	3/6/08	199.85	4446.02
					5/22/08	199.50	4446.37
					8/6/08	199.19	4446.68
					11/18/08	199.46	4446.41
					3/3/09	199.81	4446.06
					4/22/09	200.57	4445.30
					8/12/09	201.46	4444.41
					11/4/09	201.16	4444.71
					3/10/10	201.34	4444.53
					4/9/10	201.55	4444.32
TM-42	562554	603698.271	3469104.903	4666.67	3/5/08	211.04	4455.63
					5/22/08	210.98	4455.69
					8/6/08	211.55	4455.12
					11/6/08	207.05	4459.62
					2/18/09	212.31	4454.36
					5/7/09	212.37	4454.30
					8/18/09	212.77	4453.90
					11/3/09	213.05	4453.62
					2/24/10	213.36	4453.31
					4/19/10	213.51	4453.16
TVI 236	802236	600552.215	3467978.431	4561.98	5/7/08	123.30	4438.68
					7/15/08	121.55	4440.43
					10/15/08	122.35	4439.63
					2/11/09	121.28	4440.70
					4/17/09	122.73	4439.25
					7/21/09	123.96	4438.02
					10/19/09	123.88	4438.10
					2/2/10	122.26	4439.72
					4/23/10	122.70	4439.28

Table 3
Compilation of Groundwater Elevation Data

Well Name	ADWR 55 Registry No.	UTM East (meters)	UTM North (meters)	Measuring Point Elevation[1] (ft amsl)	Date	Depth To Water (feet)	Groundwater Elevation (ft amsl)
TVI 713	567713	600729.095	3468412.946	4567.22	5/7/08	127.10	4440.12
					7/14/08	126.30	4440.92
					10/15/08	130.00	4437.22
					2/11/09	149.87	4417.35
					4/17/09	126.73	4440.49
					7/21/09	127.36	4439.86
					10/19/09	127.79	4439.43
					2/2/10	126.71	4440.51
					4/23/10	127.53	4439.69
WEISKOPF	641802	601154.951	3468658.855	4586.89	2/15/08	143.31	4443.58
					5/7/08	143.90	4442.99
					7/16/08	144.22	4442.67
					10/28/08	145.81	4441.08
					1/29/09	143.99	4442.90
					4/15/09	144.38	4442.51
					7/15/09	144.99	4441.90
					10/15/09	145.66	4441.23
					2/2/10	145.28	4441.61
					4/22/10	145.72	4441.17
ZANDER	205126	599678.880	3467998.486	4580.94	2/4/08	144.85	4436.09
					5/6/08	145.33	4435.61
					7/16/08	146.40	4434.54
					10/28/08	146.01	4434.93
					2/10/09	144.83	4436.11
					4/16/09	144.94	4436.00
					7/14/09	146.14	4434.80
					10/13/09	146.77	4434.17
					1/26/10	146.34	4434.60
					4/22/10	146.27	4434.67

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

ft amsl = feet above mean sea level

NA = Not Applicable

NR = No Record

[1] Survey Source: Survey conducted by Gilbert Technical Service, Inc and Arizona Land Sepcialists, Inc. (measuring point elevation = top of well casing)

[2] Measuring point elevation for third quarter 2008 changed to reflect well survey completed on September 18, 2008

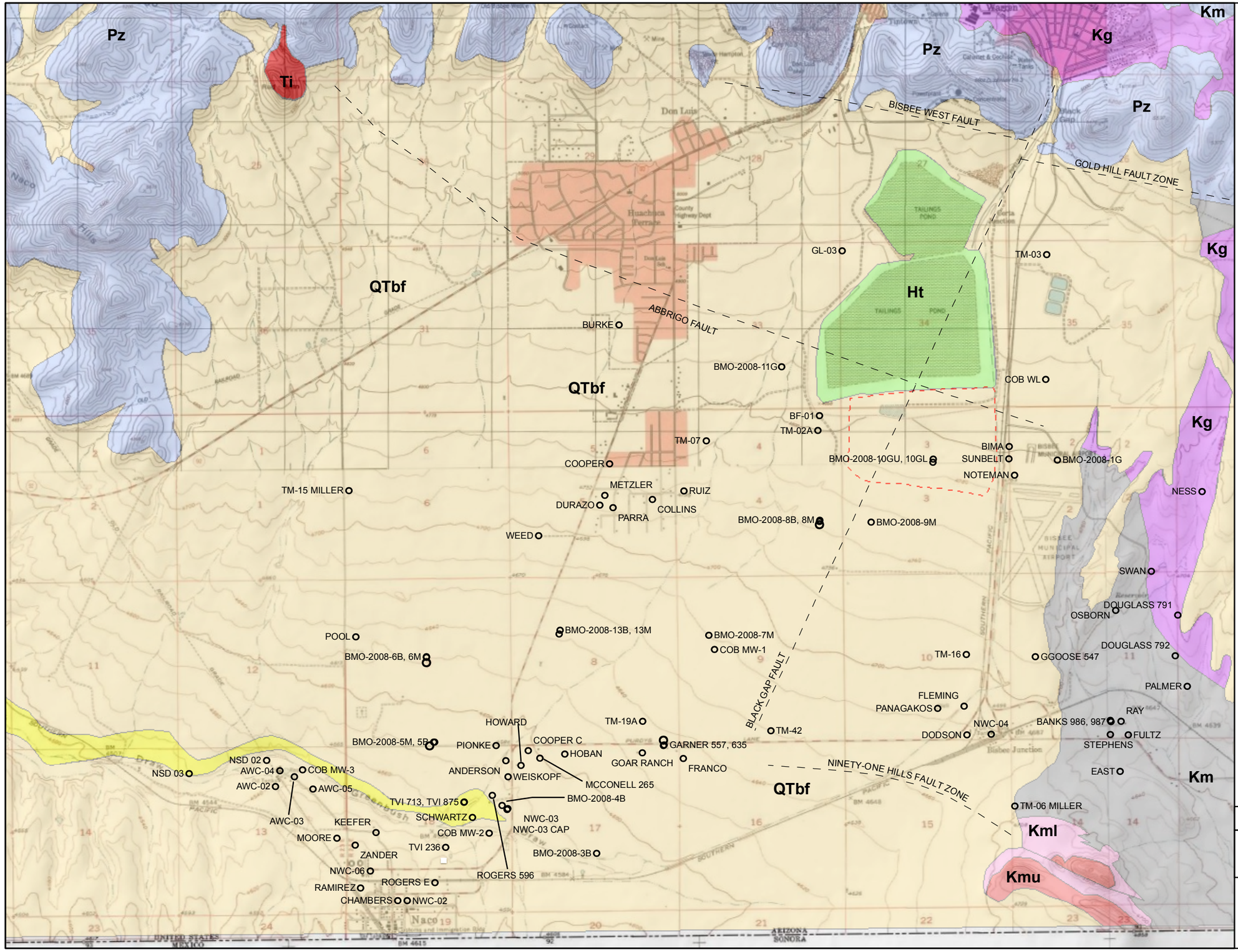
[3] Depth to Water measurement provided by Arizona Water Company

[4] Depth to Water measurement provided by Naco Water Company

[5] Measuring point elevation for second quarter 2009 changed to reflect well survey completed on April 27, 2009

[6] Well previously identified as ROGERS 803

FIGURES



Legend

- Sampling/Water Level Location
- Former Evaporation Ponds

Geologic Unit

- Ht - Holocene Tailings
- Qal - Quaternary Alluvium
- QTbf - Quaternary-Tertiary Basin Fill
- Ti - Tertiary Intrusive
- Undifferentiated Bisbee Group
  - Kc - Cintura Formation
  - Kmu - Upper Mural Limestone
  - Kml - Lower Mural Limestone
  - Km - Morita Formation
- Kg - Glance Conglomerate
- Pz - Paleozoic Sedimentary Formations

Scale

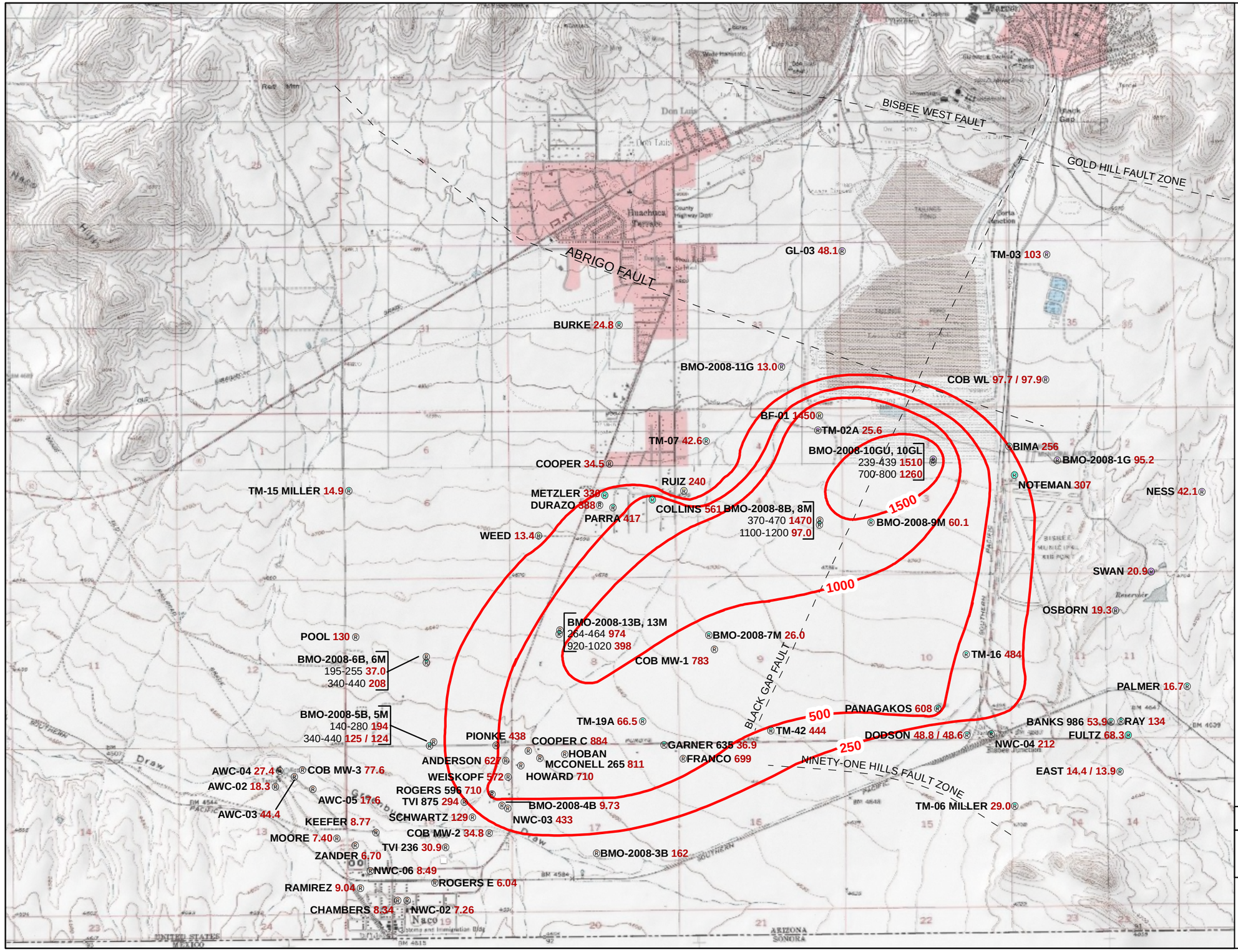
0 1,500 3,000 6,000 Feet

Notes:
Projection: UTM Zone 12N NAD83

Date	File ID
1/20/10	055038-003

CLEAR CREEK ASSOCIATES

Figure 1
Generalized Geology and Well Locations



Legend

Sulfate Concentration Contours (dashed where inferred)

Faults (inferred)

® **POOL** Well ID
130 Sulfate Concentration (mg/L)
Duplicate results separated by "/"

Co-Located Wells

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

Screened Formation

- ® Basin Fill
- ® Basin Fill and Undifferentiated Bisbee Group
- ® Undifferentiated Bisbee Group
- ® Undifferentiated Bisbee Group - Estimated
- ® Undifferentiated Bisbee Group and Glance Conglomerate
- ® Glance Conglomerate
- ® Glance Conglomerate - Estimated
- ® Unknown

Scale

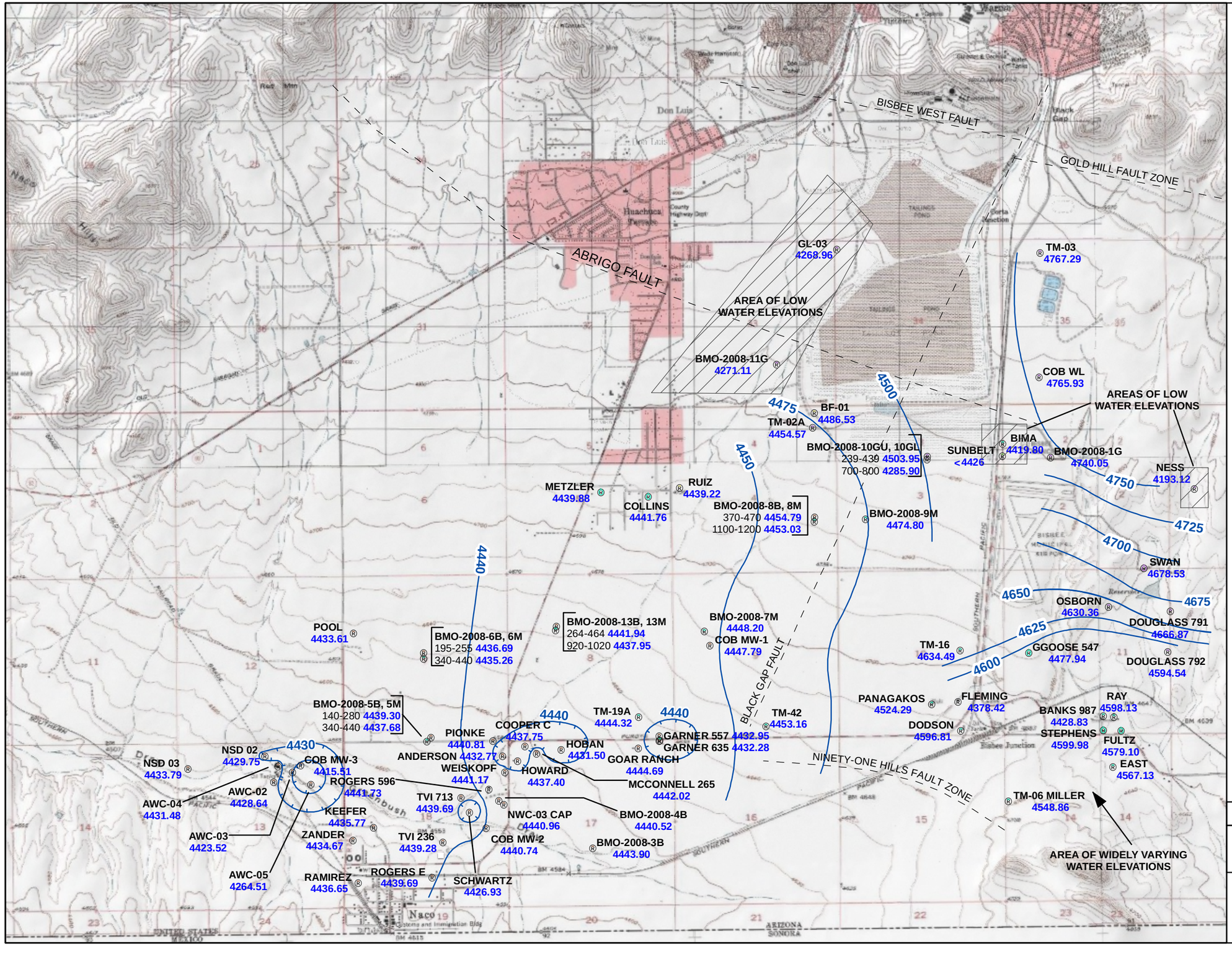
0 1,500 3,000 6,000 Feet

Notes:
Projection: UTM Zone 12N NAD83

Date	File ID
6/22/10	055038-026

CLEAR CREEK ASSOCIATES

Figure 2
Sulfate Concentrations in Groundwater for Second Quarter 2010



Legend

- Inferred Grounwater Contours (ft amsl)
- Groundwater Elevation Contour Showing Depression
- Faults (inferred)

® **POOL** Well ID
4433.61 Grounwater Elevation (ft amsl)

Co-Located Wells

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

Screened Formation

- ® Basin Fill
- ® Basin Fill and Undifferentiated Bisbee Group
- ® Undifferentiated Bisbee Group
- ® Undifferentiated Bisbee Group - Estimated
- ® Undifferentiated Bisbee Group and Glance Conglomerate
- ® Glance Conglomerate
- ® Glance Conglomerate - Estimated
- ® Unknown

Scale

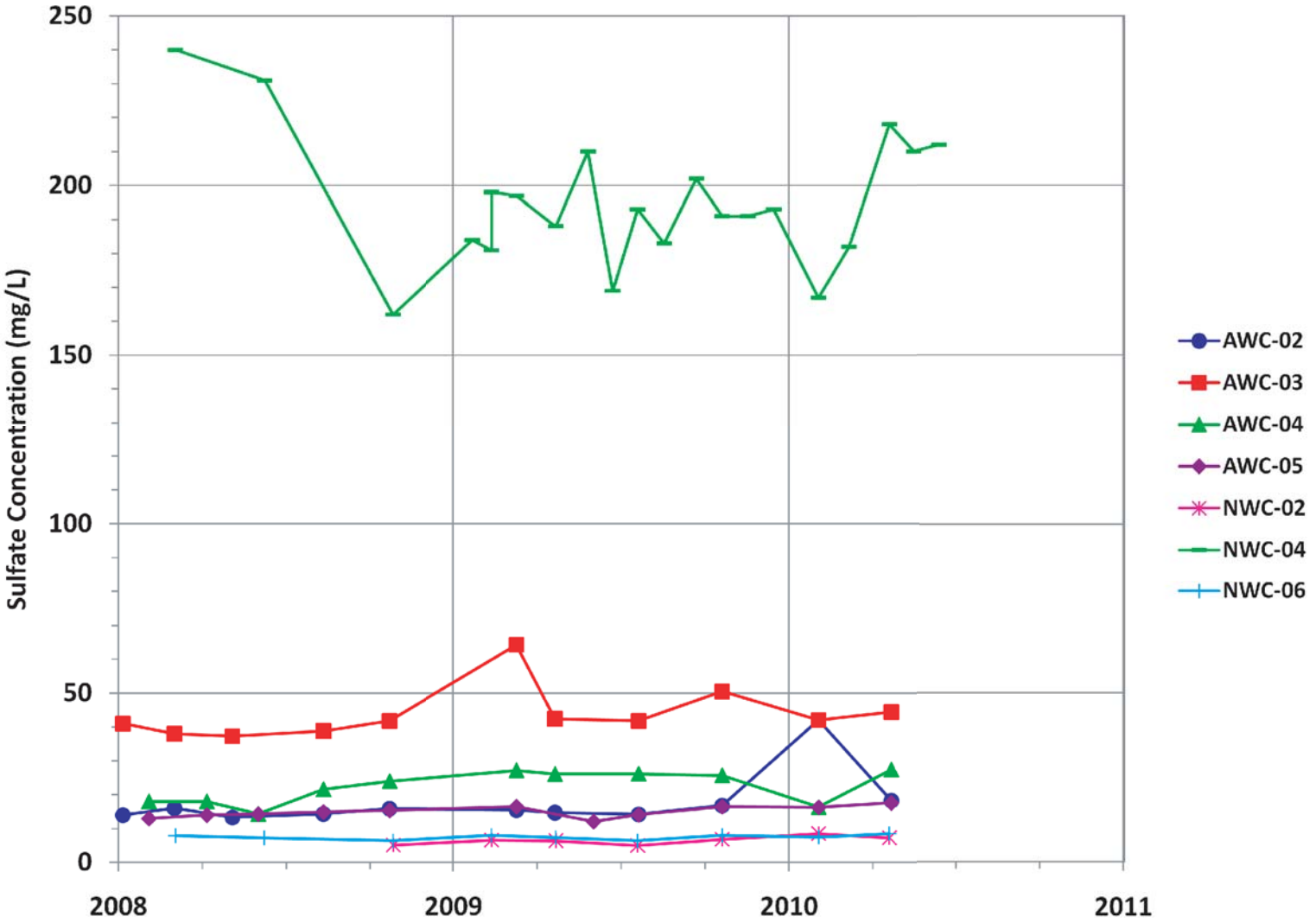
0 1,500 3,000 6,000 Feet

Notes:
Projection: UTM Zone 12N NAD83

Date	File ID
6/22/10	055038-025

CLEAR CREEK ASSOCIATES

Figure 3
Groundwater Elevations for Second Quarter 2010

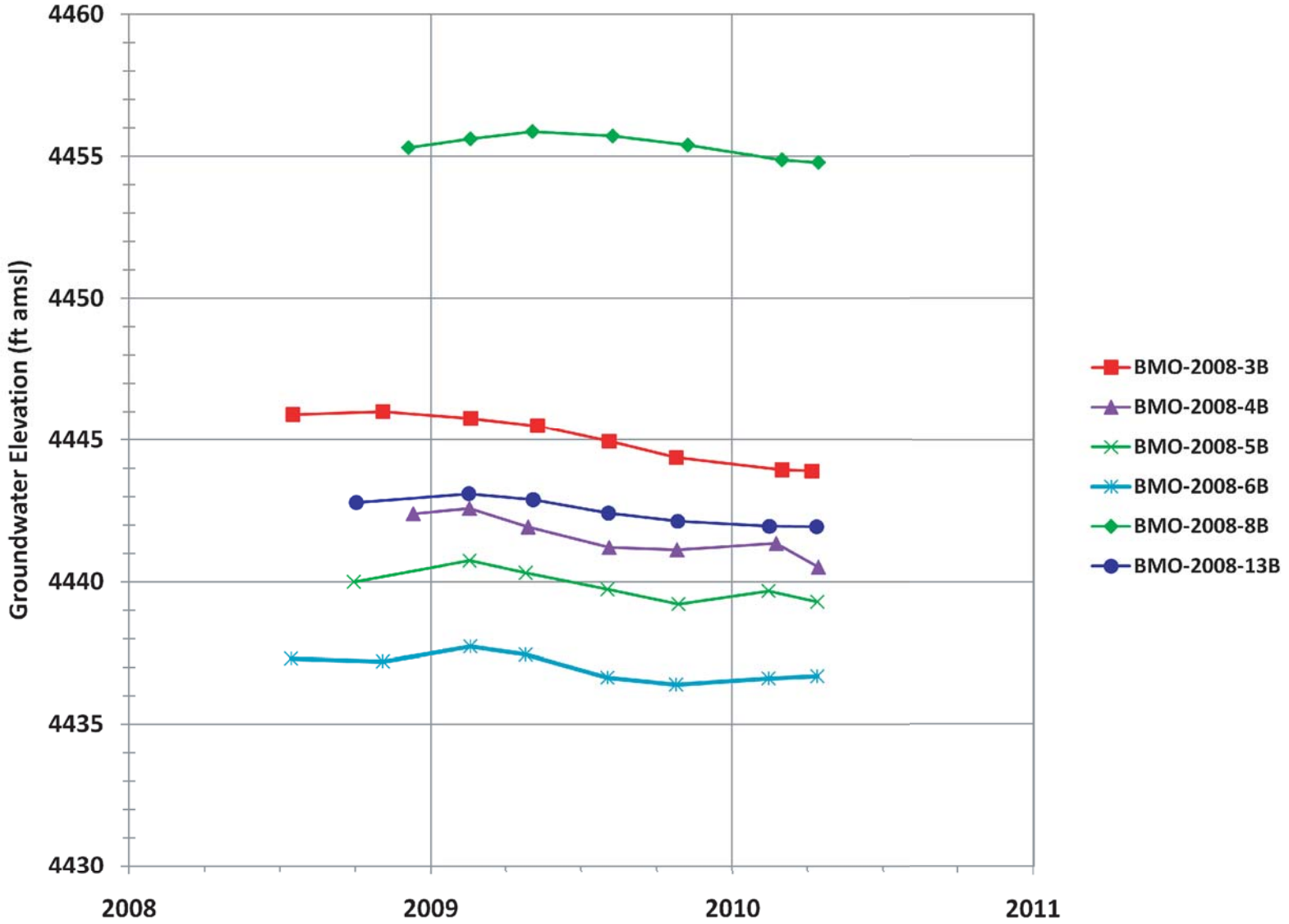


CLEAR CREEK ASSOCIATES

File ID 055038-029

Date 6/22/10

Figure 4
Sulfate Concentration Over Time
in Public Drinking Water Supply Wells

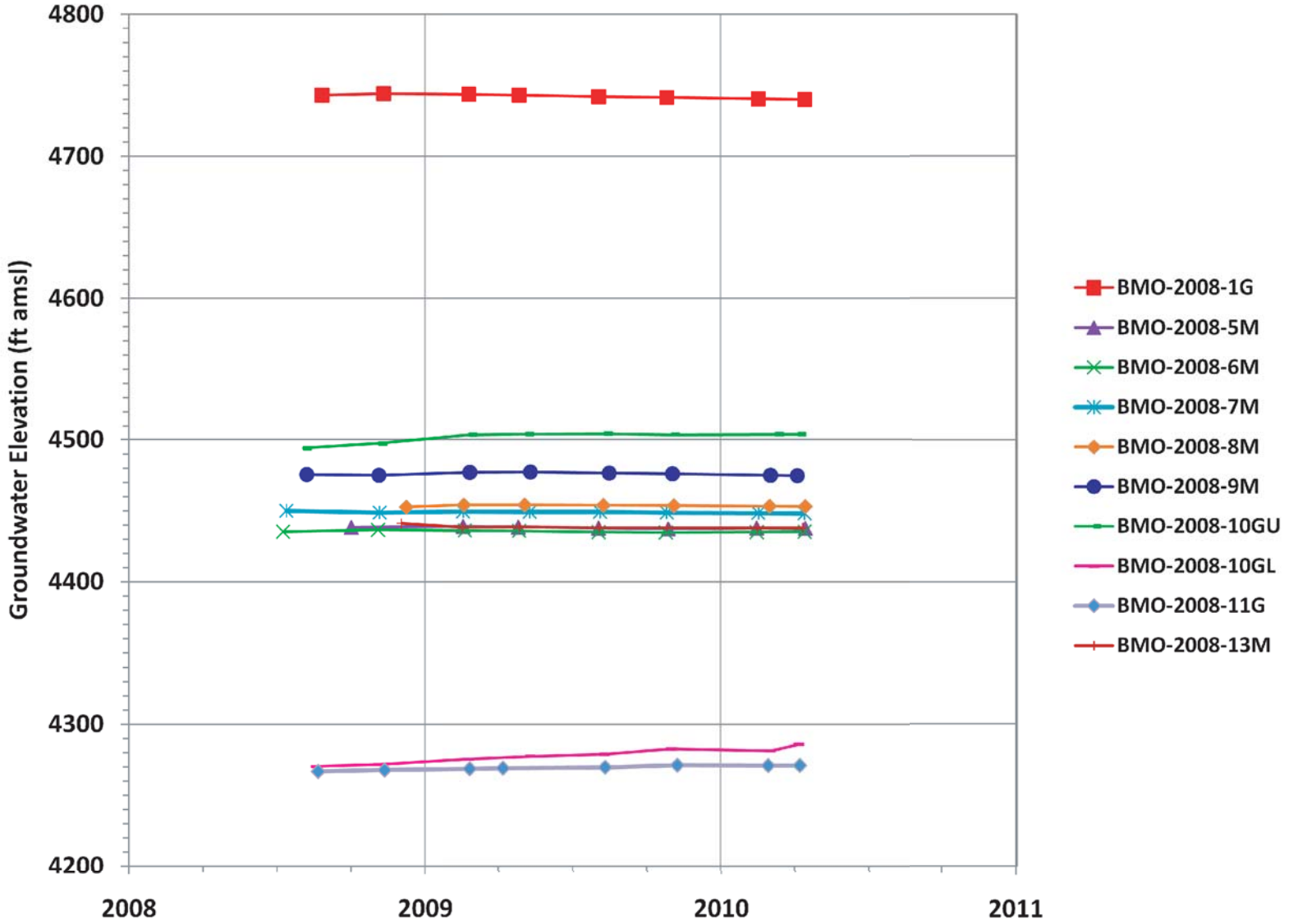


CLEAR CREEK ASSOCIATES

File ID 055038-027

Date 6/21/10

Figure 5
Hydrograph for BMO Monitor Wells
in Basin Fill



CLEAR CREEK ASSOCIATES

File ID 055038-028

Date 6/21/10

Figure 6
Hydrograph for BMO Monitor Wells in Bedrock

APPENDIX A

DATA VERIFICATION REPORT

SECOND QUARTER 2010
GROUNDWATER MONITORING REPORT

APPENDIX A

DATA VERIFICATION REPORT

SECOND QUARTER 2010
GROUNDWATER MONITORING REPORT

Prepared for:

FREEPORT-MCMORAN
COPPER QUEEN BRANCH
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Bisbee, Arizona 85603

Prepared by:

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221 North Court Avenue, Suite 101
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July 20, 2010

TABLE OF CONTENTS

1. INTRODUCTION

This report summarizes the data verification review of groundwater samples collected and analyzed during the second quarter 2010 by Clear Creek Associates (Clear Creek) and Freeport McMoRan Corporation Copper Queen Branch (CQB) pursuant to Mitigation Order on Consent Docket No. P-121-07 (ADEQ, 2007). Clear Creek and CQB collected groundwater samples from wells identified in Tasks 1.0 and 2.2 of the Work Plan (HGC, 2008). Analytical results for groundwater samples collected for this project during the second quarter 2010 were provided to Clear Creek by SVL Analytical, Inc. (SVL) for preparation of the second quarter 2010 Groundwater Monitoring Report.

Second quarter 2010 is the first quarter that SVL has provided the analysis for groundwater samples pursuant to the Mitigation Order. The SVL laboratory used for the analysis is located in Kellogg, Idaho. A current copy of SVL's Quality Manual which outlines the quality control policies of the laboratory is in Appendix B.

Quality assurance (QA) and quality control (QC) procedures are specified in the *Quality Assurance Project Plan for Aquifer Characterization Plan* (QAPP) (Appendix F of HGC, 2008) for field sampling, chain-of-custody (COC) documentation, laboratory analysis, and reporting. This report reviews field sampling for samples collected by Clear Creek and CQB. Additionally, sample handling and laboratory QA/QC data are evaluated according to the data quality indicators (DQIs) given in the QAPP.

The laboratory reports for the second quarter 2010 samples including COC forms, laboratory correspondence, QC summaries, data qualifiers, internal QA/QC tests performed by SVL and any case narratives are presented with the laboratory reports included in Appendix C. Based on the results of laboratory control samples, matrix spike/recovery and blank spikes, SVL did not advise of any modifications that should be made regarding the usability and data validation status of the laboratory test results. The analytical results for all 92 samples collected by Clear Creek and CQB are contained in 8 reports having the SVL Project numbers identified in the following table.

SVL ID	WELLS REPORTED
Number of field samples collected: 80 Number of duplicate samples collected: 4 Number of field and equipment blanks collected: 8	
W0D0220	BMO-2008-9M, BMO-2008-10GU, BF-01, TM-2A, BMO-2008-10GL, BMO-2008-3B, GL-03, BMO-2008-11G, TM-19A
W0D0394	BF-4, BF-3, BF-4A, BMO-2008-13M, TM-3, TM-16, TM-6, BMO-2008-13B, BMO-2008-6M, BMO-2008-6B, BMO-2008-1G, BMO-2008-7M, BMO-2008-5B, BMO-2008-8M, BMO-2008-8B, BMO-2008-4B, BMO-2008-5M, BF-10, TM-42
W0D0455	BIMA, NOTEMAN, DODSON, DUP041910, OSBORN, COB MW-1, BANKS 986, KEEFER, PANAGAKOS, NESS, SWAN, ANDERSON, RAY, FULTZ, EAST, SCHWARTZ, NWC-04, NWC-03, NWC-06, NWC-02, DUP042110, EQB042110, FB-42110
W0D0531	RAMIREZ, ROGERS E, MOORE, ZANDER, COOPER, BURKE, COOPER C, PALMER, PARRA, AWC-05, AWC-03, AWC-02, AWC-04, FRANCO, COLLINS, HOWARD, MCCONNELL 265, GARNER 635, POOL, WEISKOPF, ROGERS 596, TVI 236, TVI 875, CHAMBERS
W0D0553	COB-WL, COB MW-2, COB MW-3, DURAZO, RUIZ, FB042610, DUP042610, PIONKE, WEED, TM-15 MILLER, FB042710, EQB042710
W0E0474	METZLER, NWC-04
W0E0616	TM-7
W0F0270	NWC-04

2. FIELD OPERATIONS

Field operations for this project consisted of the following for all monitoring wells sampled by Clear Creek and CQB:

- Static water level measurement,
- Well purging,
- Collection of water quality field parameters (pH in standard units [SU], specific conductance [SC] in microsiemens per centimeter [µS/cm], and temperature in degrees Celsius [°C]),
- Collection of groundwater samples for water quality analysis,
- Collection of groundwater quality assurance and quality control samples, and
- Equipment decontamination.

Documentation of the field activities was evaluated for quality assurance and has been deemed to have met the documentation requirements stated in the QAPP.

2.1 Water Level Monitoring

Static water level measurements were attempted at each well that was sampled and at all wells where water level monitoring was conducted by Clear Creek and CQB. Water levels were measured while the well pump was off. However, it was not always possible to ascertain from the well owners how long the pump had been off. Before measuring the water level at each well, the battery on the water level indicator was checked and the sensitivity level was adjusted, if necessary. Each measurement was collected and verified by measuring the depth to water multiple times in order to obtain a consistent reading and accurate measurement.

2.2 Groundwater Sampling

During this monitoring period groundwater samples were collected from wells designated for sampling for Task 1.0 (well inventory) and Task 2.2 (groundwater monitoring) of the Work Plan. More detailed information regarding the wells sampled for water quality and water level measurements is listed in Table 1 of the main text.

2.2.1 Pre-Sampling Field Activities

On each day of sampling, the pH[1] and SC[2] multipurpose probe was calibrated. In addition, the water level indicator was checked for a signal which indicates a working meter and sufficient battery strength. On each day where sampling extended for more than half a day, a mid-day calibration check was performed on the pH and SC probe to ensure accurate measurement. In addition to calibrating the instruments each day, measures were taken to 1) properly decontaminate field equipment, 2) ensure the appropriate storage and transport temperature of the samples, and 3) document activities related to the collection of groundwater samples as part of this project. These objectives were met by 1) replenishing or obtaining supplies of deionized water and ice daily, 2) use of the proper preservative and sample collection containers, 3) properly packing the samples on ice during field activities, 4) using deionized water to properly decontaminate field equipment prior to the start of sampling each day and after sampling at each well, and 5) obtaining the appropriate field notebook in order to document field activities related to the groundwater monitoring program.

2.2.2 Well Purging, Field Measurements, and Sample Collection

When possible three wetted casing volumes were purged from each well prior to sampling. However, when three casing volumes could not be purged, this information was noted on the groundwater sampling form (Appendix D) at each well for which this was the case. Purge water was discharged to the ground surface.

Field measurements were collected at varying intervals during well purging at each well where a water quality sample was collected. If possible, field parameters were monitored until the measurements stabilized within 0.3 standard units for pH, 2 degrees Celsius for temperature and 100 microSiemen/centimeter for specific conductance as described in Section 4.2.1.2 of the QAPP.

During this monitoring period groundwater samples were collected for analysis from 77 plume and well inventory monitor wells. Groundwater samples were collected by filtering the sample into a 250 milliliter bottle using clean filtration apparatus and one disposable 0.45-micron filter. All bottles were provided by SVL and maintained in a clean and secure work area until used in the field.

[1] Field pH meter was calibrated using a three point calibration and pH buffers 4, 7, and 10
[2] Field SC meter was calibrated using a standard stock solution of 3900 µS/cm

2.2.3 Post-Sampling Field Activities

Post sampling field activities consisted of equipment decontamination, sample storage, and sample shipping. Field equipment that comes into contact with the sample was decontaminated using a small amount of Alconox® detergent and deionized water. After washing, the equipment was rinsed with deionized water.

After sample collection, samples from each well were placed into a plastic bag and stored on ice until they could be packed securely for shipping to SVL. In addition, sample collected from each well was individually bagged (without ice) to prevent the label from getting soaked with water and rubbing off or becoming illegible.

3. SAMPLE HANDLING

All samples collected by Clear Creek and CQB were shipped to SVL for analysis. COC documentation accompanied all samples submitted and included the sample name, collection date and time. COCs contained in laboratory reports included the date and time the samples were received by SVL. As noted on the analytical data reports from SVL, all of the sample bottles were received intact, properly preserved, and in good condition. The samples were shipped within one to three days of sample collection and the time between sample collection and receipt of samples by SVL was one to four days.

4. LABORATORY QUALITY CONTROL

As specified in the QAPP, laboratory QC was maintained for all analyses through proper licensure, the use of approved analytical methods, QC measurements, appropriate turn-around-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.

4.1 Licensure

SVL is licensed with the Arizona Department of Health Services (license number AZ0538) and is accredited in accordance with the National Environmental Laboratory Accreditation Conference.

4.2 Analytical Method

United States Environmental Protection Agency (EPA) method 300.0 was used for sulfate analysis during this monitoring period.

4.3 Method Detection Limit (MDL) and Reporting Limit (RL)

The MDL and RL of the analytical method used by SVL are shown in the following table. The MDL for analyses of samples was equal to or less than the target MDL identified in the QAPP.

Method	MDL (mg/L)	RL (mg/L)	Target MDL[1] (mg/L)
EPA 300.0	0.08	0.30	10

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

4.4 Timeliness

All samples submitted for sulfate analysis were analyzed within the twenty-eight day holding time specified by EPA Method 300.0.

4.5 Quality Control Measurements

The following QC samples were prepared and analyzed:

- Calibration blanks and calibration verification standards
- Analytical spike samples
- Laboratory duplicate samples
- Field blank samples

4.5.1 Calibration Blanks, and Calibration Verification Standards

Results from the analyses of the initial calibration blanks and initial calibration verification standards conducted by EPA Method 300.0 were reviewed. The results of each initial calibration blank analyzed showed no detections of the target analyte. All analytical results for the initial calibration verification standards and laboratory fortified blanks showed percent recoveries that were within the acceptance criteria specified by the SVL QA plan and the QAPP.

4.5.2 Analytical Spike

Analytical spike samples were analyzed for the EPA Method 300.0. The spike samples were prepared by adding a sulfate spike to randomly chosen samples. Spike recoveries for most analyses were between 80 and 120 percent. Instances in which analytical spike recoveries were unusable were qualified with an "M1" flag. In each case where an M1 qualifier was used the laboratory control sample recovery was acceptable and no corrective action was required per the SVL Quality Manual and QAPP. The laboratory control samples were prepared by adding a sulfate spike to de-ionized water.

4.5.3 Laboratory Duplicate Samples

Analyses of laboratory duplicate samples were reviewed as part of this quality data verification report. Field duplicate samples are discussed in Section 5.1. In all cases where the relative percent difference (RPD) could be calculated, the RPD was within 20 percent, which is the tolerance range set by the laboratory. The results met QA criteria and demonstrate an appropriate level of precision in laboratory analysis of these samples.

4.5.4 Field Blank Samples

During the second quarter 2010, eight field blank samples were collected. Four field blanks using unfiltered deionized water (BF-3, 042110, FB042610, FB042710, and FB031010) and four equipment blanks using filtered deionized water (BF-4, BF-4A, EQB042110, and EQB042710). Field blank samples were collected and submitted along with other samples to evaluate the potential for contaminant introduction under field conditions. As required by Section 4.2.1.5 of the QAPP, a minimum of one field blank and one equipment blank sample was collected for every twenty samples. Analytical results from field blank and equipment blank samples showed no detections.

5. 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 second quarter 2010 groundwater sampling and analysis conducted by Clear Creek and CQB.

5.1 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 Section 4.5.3 there were no exceedances of RPD QA criteria for any laboratory duplicates. During this monitoring period five field filtered duplicate samples (BF-10, DUP041910, DUP042110, and DUP042610) were collected by Clear Creek and CQB for analysis. The collection of four duplicate samples meets the QA/QC goal of collecting one duplicate sample for every twenty groundwater samples collected, as stated in Section 4.2.1.5 of the QAPP.

Results for the four field duplicate samples collected are provided in the table below. The range of RPD values was between 0.20 and 3.53 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 deemed to be met.

SVL Project No.	Well ID	Duplicate ID	Sample (mg/l)	Duplicate (mg/l)	RPD
W0D0394	BMO-2008-5M	BF-10	125	124	0.80%
W0D0553	COB-WL	DUP042610	97.7	97.9	0.20%
W0D0455	DODSON	DUP041910	48.8	48.6	0.41%
W0D0455	EAST	DUP042110	14.4	13.9	3.53%

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

5.2 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.

5.3 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 4.5.1, 4.5.2, and 4.5.3 there were no significant exceedances of the recovery QA criteria for any of the calibration standards, analytical spikes, or laboratory duplicates, respectively. Based on this information, the overall accuracy of the data is judged sufficient for the purpose of aquifer characterization.

5.4 Representativeness

All samples were taken from locations specified in the Work Plan (HGC, 2008) following sampling procedures specified in the QAPP. Therefore, the samples are judged to provide a good representation of groundwater quality at the sampled 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.

5.5 Comparability

All samples were collected using standardized procedures (HGC, 2008) and were analyzed by SVL using standardized methods. Insofar as standardized sample collection and analytical methods are adhered to, the sample results should be comparable.

5.6 Completeness

All samples collected and subsequently analyzed and reported by SVL 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.

5.7 Sensitivity

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

6. REFERENCES

Arizona Department of Environmental Quality. 2007. Mitigation Order on Consent, Docket No. P-121-07, In the Matter of: Phelps Dodge Corporation, Copper Queen Branch, located at 36 West Highway 92, Bisbee, Arizona, ADEQ Identification Number 100531. November 14, 2007.

Hydro Geo Chem, Inc. 2008. Revision 1, Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Concentrator Tailing Storage Area, Cochise County, Arizona. July 3, 2008.

APPENDIX B

SVL ANALYTICAL, INC. QUALITY MANUAL

Quality Manual

SVL ANALYTICAL, INC.
P.O. Box 929
One Government Gulch
Kellogg, Idaho 83837
208-784-1258
FAX 208-783-0891

January 2010

Wayne R. Sorensen — 2/4/10
President and CEO — Date
Wayne R. Sorensen

John R. Kern — 12-10-09
Laboratory Director — Date
John R. Kern

Kirby L. Gray — 12/21/2009
Technical Director — Date
Kirby L. Gray

Brandan Borgias — 12/14/09
Systems Manager — Date
Brandan A. Borgias, Ph.D.

Michael Desmarais — 12-10-2009
Quality Assurance Manager — Date
Michael Desmarais

Danny Sevy — 12/10/2009
Supervisor Inorganic Instrument Department — Date
Danny Sevy

James L. Hodge — 12/14/2009
Supervisor Classical Chemistry Department — Date
James L. Hodge

Additional Signatories

G. Christine Meyer — 1/6/10

Client Services Manager
G. Christine Meyer — Date

Nan S. Wilson — 2/8/10

Deputy Technical Director
Nan S. Wilson — Date

Larry Drew — 12/15/09

Deputy Technical Director
Larry Drew, Ph.D. — Date

Changes (in bold) to QM completed on 12/09/2009

Table of Contents

1.0 QUALITY POLICY STATEMENT

SVL Analytical, Inc. (SVL) recognizes that an effective quality system is paramount to providing analytical data that is legally defensible, technically accurate, and scientifically meaningful.

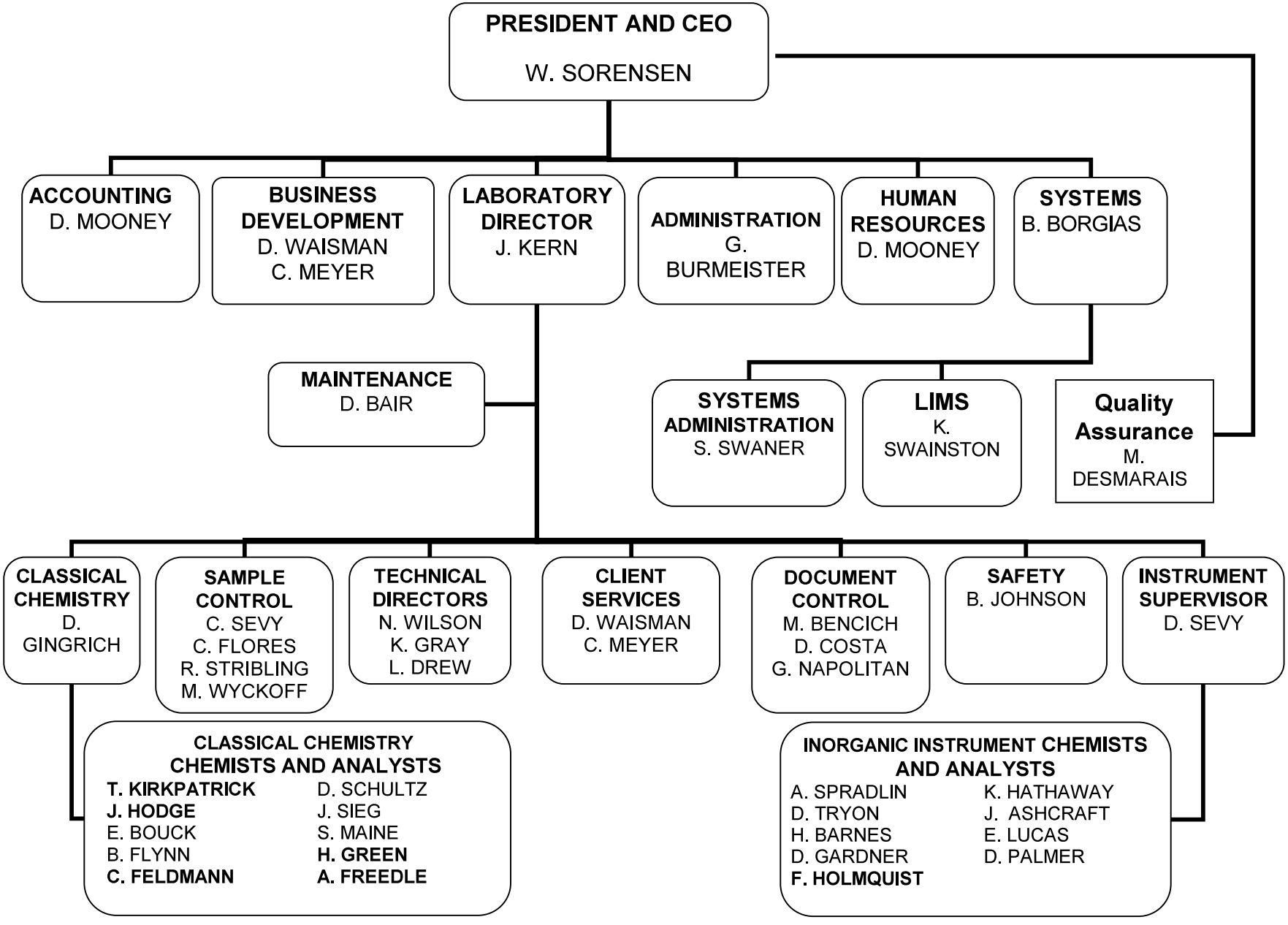
The emphasis of SVL's Quality Manual (QM) is to define control procedures for receipt, handling, and storage of samples; preparation and storage of standards; calibration and maintenance of analytical equipment; performance of analytical methods; and the generation, review, and reporting of analytical data.

At SVL, quality assurance begins with the definition of Data Quality Objectives (DQO) and continues on through data reporting. Control procedures are defined for every step of the program as detailed in SVL's Standard Operating Procedures (SOPs). SVL realizes that without these controls in all phases of the analytical process, data become suspect and hence of less value to our clients. Therefore, SVL is committed to providing data of the highest quality, usability, and defensibility for every project undertaken.

SVL's Management ensures that this **QM** complies with all applicable NELAC Quality System Standards and sees that it is reviewed annually and revised as needed. **Evidence of signatory approval by senior management of this QM and SVL SOPs are available in PDF format by request.**

2.0 ORGANIZATION AND STRUCTURE

The organizational structure of SVL follows a traditional scheme of management with a few modifications. The President/CEO is at the top of the chain of command followed immediately by the Laboratory Director, Systems Manager, Business Development, Human Resources, Administration and Accounting. The Quality Assurance Manager reports directly to the President/CEO. Technical Directors, Client Services, Sample Control, Classical Chemistry Department, Inorganic Instrument Department, Safety, Document Control and Maintenance Department report to the Laboratory Director. Systems Administrator and LIMS Chemist report to the Systems Manager.


PRESIDENT AND CEO
W. SORENSEN
ACCOUNTING
D. MOONEY
BUSINESS DEVELOPMENT
D. WAISMAN
C. MEYER
LABORATORY DIRECTOR
J. KERN
ADMINISTRATION
G. BURMEISTER
HUMAN RESOURCES
D. MOONEY
SYSTEMS
B. BORGIAS
MAINTENANCE
D. BAIR
SYSTEMS ADMINISTRATION
S. SWANER
LIMS
K. SWAINSTON
Quality Assurance
M. DESMARAIS
CLASSICAL CHEMISTRY
D. GINGRICH
SAMPLE CONTROL
C. SEVY
C. FLORES
R. STRIBLING
M. WYCKOFF
TECHNICAL DIRECTORS
N. WILSON
K. GRAY
L. DREW
CLIENT SERVICES
D. WAISMAN
C. MEYER
DOCUMENT CONTROL
M. BENCICH
D. COSTA
G. NAPOLITAN
SAFETY
B. JOHNSON
INSTRUMENT SUPERVISOR
D. SEVY
CLASSICAL CHEMISTRY
CHEMISTS AND ANALYSTS
T. KIRKPATRICK
J. HODGE
E. BOUCK
B. FLYNN
C. FELDMANN
D. SCHULTZ
J. SIEG
S. MAINE
H. GREEN
A. FREEDLE
INORGANIC INSTRUMENT CHEMISTS AND ANALYSTS
A. SPRADLIN
D. TRYON
H. BARNES
D. GARDNER
F. HOLMQUIST
K. HATHAWAY
J. ASHCRAFT
E. LUCAS
D. PALMER

2.2 Employee List

Position	Employee	Degree	Years of Lab Experience
President and CEO	Wayne Sorensen	BS 1962	**43**
Laboratory Director	John R. Kern	MS 1982	**27**
Business Development/Safety Officer	Blake Johnson	PhD 1971	**25**
Systems Manager	Brandan A. Borgias	PhD 1985	**29**
Document Control Officer	Melba Bencich		**29**
Client Services Manager	G. Christine Meyer		**31**
Business Development Manager	Dave Waisman	MS 1985	**16**
Technical Director	Kirby L. Gray	BS 1972	**25**
Deputy Technical Director/Safety Director	Nan Wilson	BS 1996	**14**
Deputy Technical Director	Larry Drew	PhD 1973	**7**
Supervisor Inorganic Instrument	Danny Sevy		**22**
Supervisor Classical Chemistry	**Daniel K. Gingrich II**	**BS 2008**	**3**
Systems Administrator	Scott Swaner		**7**
LIMS Chemist	Kale Swainston	BS 1998	**7**
Accounting and Human Resources	Donella Mooney		**19**
Quality Assurance Manager	Michael Desmarais	BS 1995	**13**
ICP Spectroptomist	Anne L. Spradlin	BA 1983	**24**
ICP Chemist	**Felicia Holmquist**	**BS 2008**	**2**
ICP Analyst	David Tryon		**6**
ICP and ICP-MS Chemist	Dianne Gardner	BA 1987	**6**
ICP-MS and GFAA Analyst	Kevin Hathaway		**22**
CVAA Analyst	Judy Ashcraft		**40**
Chemist	**Theresa Kirkpatrick**	**BS 2006**	**3**
Chemist	Brian Flynn	MS 2003	**4**
Chemist	**Jim Hodge**		**43**
Chemist	**Charles Feldmann**	**BA 2007**	**4**
Chemist	Sherry Maine	MS 2004	**9**
Chemist	Emily Lucas	BA 2005	**2**
Chemist	**Heather Green**	**BS 2009**	**2**
Analyst	**Anita Guzman-**	**BS 1979**	**2**
Analyst	Dean Palmer	BS 1979	**11**
Analyst	Eric Bouck		**2**
Analyst	Debbie Schultz		**8**
Analyst	Heidi Barnes		**7**
Analyst	Jennifer Sieg		**3**
Sample Control Officer	Crystal Sevy		**7**
Sample Receiving	Cindy Flores		**8**
Sample Receiving	Robin Stribling		**4**
Sample Receiving	Merrillyn Wyckoff		**2**
Document Control	Dianne Costa		**3**
Document Control	Geri Napolitan		**4**
Maintenance	Dan Bair		**3**
Receptionist	Gloria Burmeister		**7**

2.3 Key Employee Resumes

Resumes of key employees are in Section 27.0.

3.0 JOB DESCRIPTIONS

3.1 Laboratory Director

The Laboratory Director supervises day-to-day operations of the laboratory. Responsible for monitoring standards of performance in quality control and quality assurance, and for monitoring the validity of the analyses performed and data generated in the laboratory. The Laboratory Director holds a weekly staff meeting to discuss client and technical issues.

3.2 Systems Manager

The Systems Manager supervises operations of the Information Technology groups. The Systems Manager uses Excel, Crystal Reports and other database programs to develop and maintain client reports and electronic data deliverables. Element is the laboratory's LIMS and the Systems Manager works with the LIMS Chemist to make sure that Element meets the needs of SVL. The Systems Manager is responsible for the development of IS/IT protocols.

3.3 Department Supervisor

Department supervisors conduct the day-to-day operations of our analytical departments. They are responsible for department safety and analyst training. They are also responsible for review of out-going analytical data.

3.4 Quality Assurance Manager (QAM)

The QAM is responsible for implementation of the quality system. The QAM manages the performance evaluation sample program and conducts laboratory audits. The QAM obtains and maintains laboratory accreditations, reviews and approves SOPs, and conducts staff training in integrity and quality systems.

3.5 Document Control Officer (DCO)

DCO is responsible for the generation and the retention of analytical reports and records, including but not limited to Chains-of-Custody and

sample shipping documents. DCO is also responsible for delivering electronic data deliverables.

3.6 Sample Control Officer (SCO)

SCO is responsible for sample receipt, job creation/verification, sample storage and sample disposal.

3.7 Technical Director

Technical Directors provide technical support to laboratory staff and provide final reviews of analytical data packages.

4.0 APPROVED LABORATORY SIGNATORIES

The Laboratory Director John Kern, Systems Manager Brandan Borgias, Technical Director Kirby Gray, Deputy Technical Directors, Larry Drew and Nan Wilson, Department Supervisors Jim Hodge and Danny Sevy are approved laboratory signatories for analytical reports. QAM Michael Desmarais has report generation privileges.

5.0 RECORDS AND DOCUMENT CONTROL

5.1 Standard Operating Procedures (SOPs)

The QAM retains the master copies of SOPs. Electronic copies are available on the laboratory's computer network. **Signed and dated SOPs are available by request in PDF format.** All SOPs are scheduled for review each year. Electronic copies are available on the laboratory network on the date of the QAM's review with promulgation two weeks after that date. When a revision is created, the previous version is removed from the master file and electronic database, with a hard copy retained for the SOP archive file.

5.2 Quality Manual (QM)

The QAM retains the master copy of the QM. The QM is scheduled for review annually or when revisions are needed. Management may make hard copies available to Accrediting Authorities, laboratory staff and clients as needed; otherwise, the QM is available in electronic format. **A signed and dated QM is available by request in PDF format.** When

a revision is created, previous versions are removed from use, and a copy is retained in the QM archive file.

5.3 Analytical Data

The Document Control Officer (DCO) retains analytical data, including calibration records and quality control, for five years, unless a longer period is required by contract.

5.4 Training Records

The QAM maintains records of analyst training and proficiency; **ref, SOP SVL 1010**.

5.5 Performance Evaluation Samples

The QAM maintains records of analysis of performance evaluation samples and the reports associated with the analyses.

5.6 External and Internal Audits

The QAM retains records of external and internal audits.

5.7 Corrective Action Reports

Are kept electronically and filed by hardcopy.

5.8 Laboratory Logbooks

SVL controls the issue, use, and closure of laboratory logbooks. The process is described in SOP SVL 2017. Examples of logbooks may include: the conductivity of laboratory water, preparation of reagents and standards, preparation of samples, calibration of balances, calibration of micropipets, volumetric pipets, repipettors, maintenance of instruments, and temperatures of ovens and refrigerators. The QAM assigns and archives logbooks.

5.9 Chain of Custody (COC)

The DCO is in charge of COC retention; they are currently held for five years, unless a longer time is required by contract. Sample log-in and job creation are maintained in SVL's LIMS. **COCs are scanned into PDF format, which can be accessed through Element.**

5.10 Analytical Reports

The DCO retains photocopies of **CLP** analytical reports for five years, unless a longer time is required by contract. **Copies of CLP-like and non CLP reports are saved as PDF files; the files are backed up and** archived for five years. Archived analytical reports are stored in a secured environment to protect them from damage.

5.11 Backup and Storage of Electronic Data

5.11.1 Electronic Data Collection: Currently the backup server is protected with an administrative password, which is changed every 6 months; it is in control of the Systems Administrator**; ref, SOPs SVL 2020 and 2021.**

5.11.2 Archives of Electronic Data: Data files that reside on the SVL file servers are backed up on a daily basis and kept onsite for 90 days: a full backup of the data files residing on the server is done monthly and sent to an offsite storage facility for 5 years. All software used to recover data files is also stored at the offsite facility.

5.11.3 Offsite Backup Storage: A secure offsite facility is maintained to house the electronic data collected by the current backup system.

6.0 TRACEABILITY OF MEASUREMENTS

6.1 Chemicals and Reagents

SVL uses reagent grade or better chemicals. Some equivalent grades are "Fisher Trace Metals", "Baker Instra-Analyzed", "Baker A.C.S.", "Baker Analyzed", "Fisher A.C.S.", and "Fisher Certified". SVL requires a certificate of analysis or purity, for stock calibration standards. Upon receipt the chemicals are labeled and entered into SVL's LIMS.

SVL records the preparation of reagents and standards in controlled logbooks or electronically in the LIMS. The initials of the preparer, the date prepared, the lot number and amount of stock materials, the final volume, the matrix, and the expiration date are all recorded. A label is created within the LIMS and is attached to all aliquots of the standard.

Preparation instructions are included in the SOPs for the analytical methods. **EPA supplied reference material solutions are prepared**

following EPA QATS specific instructions for diluting these solutions.

SVL labels containers of prepared reagents and standards with their contents, a unique reference number, date prepared, disposal (expiration) date and a perceived hazard warning.

SVL routinely obtains reference standards from commercial sources. These standards are used to check and document the concentration of calibration standards and validate method QC requirements.

SVL stores reagents and standards separately from samples.

6.2 Water

The primary reagent water in the laboratory is furnished by a reverse osmosis system followed by a micropore filter with an ion-exchange resin cartridge. This satisfies the specifications of ASTM Type II water. When Type I (16.67 MΩ-cm) water is required, SVL inserts a four-cartridge ion-exchange system into the line. SVL measures and records the resistivity of the laboratory water each weekday.

7.0 TEST METHODS

7.1 Analyses Performed by SVL

SVL routinely performs the following analytical methods.

ANALYTE	METHOD	TECHNIQUE
Aluminum	EPA 200.7, SW846 6010B	ICP
Antimony	EPA 200.7, SW846 6010B	ICP
Antimony	EPA 200.8, SW846 6020	ICPMS
Arsenic	EPA 200.7, SW846 6010B	ICP
Arsenic	EPA 200.8, SW846 6020	ICPMS
Barium	EPA 200.7, SW846 6010B	ICP
Barium	EPA 200.8, SW846 6020	ICPMS
Beryllium	EPA 200.7, SW846 6010B	ICP
Beryllium	EPA 200.8, SW846 6020	ICPMS
Boron	EPA 200.7, SW846 6010B	ICP
Boron	EPA 200.8, SW846 6020	ICPMS
Cadmium	EPA 200.7, SW846 6010B	ICP
Cadmium	EPA 200.8, SW846 6020	ICPMS
Calcium	EPA 200.7, SW846 6010B	ICP
Chromium	EPA 200.7, SW846 6010B	ICP
Chromium	EPA 200.8, SW846 6020	ICPMS

ANALYTE	METHOD	TECHNIQUE
Chromium, Hexavalent	SM 3500 CR B , D	Colorimetry
Cobalt	EPA 200.7, SW846 6010B	ICP
Cobalt	EPA 200.8, SW846 6020	ICPMS
Copper	EPA 200.7, SW846 6010B	ICP
Copper	EPA 200.8, SW846 6020	ICPMS
Gallium	EPA 200.7, SW846 6010	ICP
Gold	EPA 231.2	GFAA
Iron	EPA 200.7, SW846 6010B	ICP
Lanthanum	EPA 200.7, SW846 6010B	ICP
Lead	EPA 200.7, SW846 6010B	ICP
Lead	EPA 200.8, SW846 6020	ICPMS
Lithium	EPA 200.7, SW846 6010B	ICP
Magnesium	EPA 200.7, SW846 6010B	ICP
Manganese	EPA 200.7, SW846 6010B	ICP
Manganese	EPA 200.8, SW846 6020	ICPMS
Mercury	EPA 245.1, SW846 7470A, 7471A	CVAA
Molybdenum	EPA 200.7, SW846 6010B	ICP
Molybdenum	EPA 200.8, SW846 6020	ICPMS
Nickel	EPA 200.7, SW846 6010B	ICP
Nickel	EPA 200.8, SW846 6020	ICPMS
Potassium	EPA 200.7, SW846 6010B	ICP
Scandium	EPA 200.7, SW846 6010B	ICP
Selenium	SM 3114C	Hydride AA
Selenium	EPA 200.7, SW846 6010B	ICP
Selenium	EPA 200.8, SW846 6020	ICPMS
Silica	EPA 200.7	ICP
Silver	EPA 200.7, SW846 6010B	ICP
Silver	EPA 200.8, SW846 6020	ICPMS
Sodium	EPA 200.7, SW846 6010B	ICP
Strontium	EPA 200.7, SW846 6010B	ICP
Thallium	EPA 200.7, SW846 6010B	ICP
Thallium	EPA 200.8, SW846 6020	ICPMS
Tin	EPA 200.7, SW846 6010B	ICP
Titanium	EPA 200.7, SW846 6010B	ICP
Uranium	EPA 200.8	ICPMS
Vanadium	EPA 200.7, SW846 6010B	ICP
Vanadium	EPA 200.8, SW846 6020	ICPMS
Zinc	EPA 200.7, SW846 6010B	ICP
Zinc	EPA 200.8, SW846 6020	ICPMS
Acidity	SM 2310 B	Automated Titration
Alkalinity	SM 2320 B	Automated Titration
Ammonia	EPA 350.1	Automated Colorimetry
Bromide	EPA 300.0	Ion Chromatography
Chemical Oxygen Demand	EPA 410.4	Colorimetry
Chloride	EPA 300.0	Ion Chromatography
Color	SM 2120 B	Colorimetry
Conductivity	EPA 120.1	Wheatstone Bridge
Corrosivity	SM 2330 B	Langelier Index

ANALYTE	**METHOD**	**TECHNIQUE**
Cyanide, Total	EPA 335.4, SW 846 9012B	Automated Colorimetry
Cyanide, Free	SW-846 EPA 9213	Ion Specific Electrode
Cyanide, WAD	SM 4500 CN I	Automated Colorimetry
Cyanide, Available	OIA 1677	Amperometry
Fluoride	EPA 300.0	Ion Chromatography
Hardness	SM 2340B, Ca as $CaCO_3$ by 200.7	ICP Sum
Nitrate	EPA 300.0	Ion Chromatography
Nitrate + Nitrite	EPA 353.2	Automated Colorimetry
Nitrate + Nitrite	EPA 300.0	Ion Chromatography
Nitrite	EPA 300.0	Ion Chromatography
Nitrite	EPA 353.2	Automated Colorimetry
Odor	SM 2150B	Sniff Panel
ortho-Phosphate	SM 4500 P E, 300.0	Colorimetry, IC
pH (aqueous)	SM 4500-H^+ B	Electrometric
pH (soil)	EPA 9045C, EPA 9045D	Electrometric
Paste pH	ASA Monograph 9	Electrometric
Phosphate, Total	SM 4500 P E	Persulfate Digestion
Residue, Filterable (TDS)	SM 2540 C	Gravimetric
Residue, Non Filterable (TSS)	SM 2540 D	Gravimetric
Settleable Solids	SM 2540 F	Volumetric
Specific Conductance	EPA 120.1, SM 2510 B	Wheatstone Bridge
Sulfate	EPA 300.0	Ion Chromatography
Sulfide	SM 4500 S^{-2} F	Titrimetric
Surfactants (MBAS)	SM 5540 C	Colorimetry
Total Solids	SM 2540 B	Gravimetric
Total Kjeldahl Nitrogen	EPA 351.2, SM 4500 NH_3D	Colorimetry
Total Organic Carbon	SM 5310 B	Combustion
Total Volatile Solids	EPA 160.4	Gravimetric
Turbidity	EPA 180.1	Nephelometric
TCLP (Toxicity Characteristic Leaching)	SW846 1311	Extraction
SPLP (Synthetic Precipitation Leaching)	SW846 1312	Extraction
STLC (Soluble Threshold Limit Concentration)		Extraction
MWMP (Meteoric Water Mobility)	ASTM E2242-02	Extraction
CA-WET (California Waste Extraction Test)		Extraction
CEC (Cation Exchange Capacity)	SW846 9081, 9080	
Textural Analysis (Particle Size)	ASA “Methods of Soil Analysis” Number 9, Part 1	
Specific Gravity		Displacement
TOM/TOC	USDA, HB60(24)	
ANP (Acid Neutralization Potential)		Titration

ANALYTE	**METHOD**	**TECHNIQUE**
ABA (Acid Base Account)	ASTM E1915-05	LECO
Total Sulfur + Sulfur Forms	ASTM E1915-05	LECO
Total Carbon	ASTM E1915-05	LECO
Arsenic Speciation	K.S. Subramanian et al.	GFAA
Iron Speciation	HACH-8146	Colorimetry
Gradation		Sieving
Loss on Ignition	Soil & Plant Analysis Council	Gravimetric
Percent Silica	ASTM 2795	Colorimetry
Tot Suspended Particulates	40CFR 50, App B amend 12/6/82	Gravimetric
Flash Point	SW-846 1010, ASTM D93-80	Closed Cup

7.2 References

Methods for Chemical Analysis of Water and Wastes, revised March 1983, EPA-600/4-79-020.

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

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

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW 846), Third Edition, Update III, December 1996.

Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992

Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995

Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1999

ASTM Book of Standards, part 31

Soil Testing and Plant Analysis, 3rd Edition, Soil Sciences Society of America, 1990

American Society of Agronomy, "Methods of Soil Analysis" Number 9, Parts 1 and 2

U.S. Department of Agriculture, Handbook #60

U.S. Department of the Interior, Bureau of Reclamation, Procedure for Determining Moisture, Ash, and Organic Content of Soil, USBR 5430-89

Manual for the Certification of Laboratories Analyzing Drinking Water, Fifth Edition

U.S. Environmental Protection Agency SOW ILMO5.4 for Inorganic Analysis, Multi-Media, Multi-Concentration for CLP

8.0 NEW WORK

The Business Development group discusses new work with clients before the work is received. If the work being requested involves tests not usually performed by SVL, the project is discussed with Department Supervisors to determine if the work can be accepted. Quotes and projects are logged so that there is no confusion about what is expected by the client. If work is received that does not adhere to the guidelines put forth in the quote or project, the client will be contacted for clarification. Occasionally SVL receives a work order with no prior notification that requests unusual tests, or tests to be conducted in a time frame not suitable for the work requested. When this occurs, the SCO reviews the job with Client Services and/or Department Supervisors to determine if the work can or should be accepted. Routine work from established clients normally is not reviewed with the clients before jobs are set up, unless there is a problem with sample integrity or information on the COC.

SVL reviews and makes available in LIMS, the parameters associated with a client's project (work order memos can be attached when special instructions are involved). A schedule can be derived for the work that has been received; this allows the staff to plan workloads and to track jobs. A Laboratory/Technical Director or Client Services member shall review all work orders. Adjustments to work schedules and staff deployment are made based upon the workload. Department Supervisors keep equipment and supplies on hand for routine work and for many non-routine tests as well.

8.1 Sample Acceptance Policy

8.1.1 Samples received at SVL will be accepted for testing if the following criteria are met at the time of sample receipt:

A proper SVL or client COC will accompany the sample shipment and must be completed in full (unless a project number is specified and is on file with SVL), including but not limited to; the client's name, address, phone/fax numbers, contact person, unique sample identification of individual samples, sample locations (if applicable), date and time of collection, collector's name, preservative type, sample matrix, filtered or unfiltered, number of bottles, analytes and/or tests to be performed, method of analysis, and any comments concerning sample specifics or QC requirements.

The use of correct sample containers (with proper preservation) for the sample matrices collected and ensuring that sufficient sample volume is provided for the tests requested (including extra volumes for QC requirements).

Accurate labeling of sample bottles using coded, water resistant labels and permanent ink, with said labels being cross referenced with information contained in the COC.

Adherence to holding time requirements as required by test or method requested.

8.1.2 In the event that a sample is received in non-compliance with this policy, the sample in question will be segregated and the client notified by telephone or email. The client may direct SVL to continue on with analysis of the non-conforming sample(s). Non-conformity will be noted on the Sample Receipt/Chain of Custody and within the Final Report**; ref, SOP SVL 2001.**

8.1.3 New clients will be informed of this policy through Client Services or Sample Receiving. They will be provided with a copy of the QM (hard copy or electronically) or a hand out on sample acceptance (located in SVL's waiting room or in Sample Receiving).

Current clients will receive a copy of the sample acceptance policy if they bring in samples that do not meet SVL's requirements.

9.0 CALIBRATION

9.1 Thermometers

Calibrating thermometers is described in SOP SVL 1004.

An outside company calibrates SVL's NIST-certified thermometers.

SVL calibrates in-house liquid-in-glass thermometers against a NIST-certified thermometer. Digital thermometers are calibrated against a NIST-certified thermometer. The thermometers are then labeled with a correction factor.

9.2 Balances

Servicing and calibrating balances is described in SOP SVL 1025.

An outside company services and calibrates SVL's balances.

SVL checks the calibration of a balance before each day of use with at least two weights traceable to a NIST traceable standard. For analytical balances, the measured weight must agree with the certified weight within 0.1%. Balances that fail the criterion are checked with Class-1 weights. If they fail again, they are removed from service.

9.3 Balance Weights

Calibrating balance weights is described in SOP SVL 1025.

An outside company calibrates SVL's set of Class-1 weights, with Reference Standards Traceable to NIST.

SVL uses Class-1 weights to certify the Class-4 weights used for the daily calibration of balances.

9.4 Micropipets

The calibration of micropipets is described in SOP SVL 1026.

SVL checks the calibration of variable-volume micropipets each day of use. Fixed-volume micropipets are checked quarterly. The mean of three measured volumes must agree with the expected value within 3%. Micropipets that fail this criterion are repaired or removed from service.

9.5 Repipettors

The calibration of repipettors is described in SOP SVL 1026.

SVL checks the calibration of repipettors quarterly. The measured volume must agree with the expected value within 3%. Repipettors that fail this criterion are repaired or removed from service.

9.6 Refrigerators

SVL records the temperature of sample, standard, and reagent storage refrigerators each weekday. The process is described in SOP SVL 2004. The temperature must meet the **4°C ± 2ºC as described in SOP SVL 2001-ILMO5.4 for CLP samples and 0-6°C for non CLP samples.** If a temperature is outside this criterion, the temperature is recorded again after one hour. If the temperature is still outside the acceptance range, samples, standards, and reagents are transferred to alternate refrigerators or coolers.

9.7 Ovens

SVL records the temperature of ovens for drying solids each weekday. The required temperature is stated in the applicable SOPs.

9.8 Inductively Coupled Plasma Mass Spectrometer (ICP-MS)

SVL calibrates its ICP-MS in accordance with EPA methods 200.8**, 6020, and CLP SOW ILMO5.4. In accordance with the CLP SOW, a tune standard analysis is performed prior to calibration.** Five calibration standards and a calibration blank are analyzed at the beginning of a sequence. The software creates a linear calibration curve that must have a correlation coefficient of at least 0.995. An Initial Calibration Verification (ICV) from a secondary source follows to verify the calibration. An Initial Calibration Blank (ICB) indicates the system is clean. A Reporting Limit Check Standard (RLCS) indicates that the results derived at the reporting limit can be recovered within our acceptance criteria. Analysis of a Continuing Calibration Verification (CCV) and a Continuing Calibration Blank (CCB) follow after every ten samples and at the end of the analytical sequence. The acceptance criteria are defined in SOP SVL 4111.

9.9 Inductively Coupled Plasma Spectrometer (ICP)

SVL calibrates ICPs in accordance with EPA methods 200.7 and 6010B. A single calibration standard and a calibration blank are analyzed at the beginning of a sequence. A standard at the reporting limit is analyzed to verify that the instrument will detect a response at that level. An ICV from a secondary source follows to verify the calibration. An ICB indicates the system is clean. An RLCS (in this case called a CRI) indicates that the results derived at the reporting limit can be recovered within our acceptance criteria. Analysis of a CCV and a CCB follow

after every ten samples and at the end of the analytical sequence. The acceptance criteria are defined in SOP SVL 4102.

9.10 Graphite Furnace Atomic Absorption Spectrometer (GFAA)

SVL calibrates it's GFAA in accordance with EPA method 231.2 for gold and K.S. Subramanian et al. for arsenic speciation. Three calibration standards and a calibration blank are analyzed at the beginning of a sequence. Perkin-Elmer instruments create a linear calibration curve that must have a correlation coefficient of at least 0.995. An ICV from a secondary source follows to verify the calibration. An ICB indicates the system is clean. An RLCS indicates that the results derived at the reporting limit can be recovered within our acceptance criteria. Analysis of a CCV and a CCB follow after every ten samples and at the end of the analytical sequence. The acceptance criteria are defined in SOP SVL 4115.

9.11 Mercury Analyzer (CVAA)

SVL calibrates its CVAA in accordance with EPA methods 245.1, 7470A, and 7471A. Six calibration standards and a calibration blank are analyzed at the beginning of a sequence. The instrument creates a linear calibration curve that must have a correlation coefficient of at least 0.995. An ICV from a secondary source follows to verify the calibration. An Initial Calibration Blank (ICB) indicates the system is clean. An RLCS indicates that the results derived at the reporting limit can be recovered within our acceptance criteria. Analysis of a CCV and a CCB follow after every ten samples and at the end of the analytical sequence. The acceptance criteria are defined in SOP SVL 4010.

9.12 Flame Atomic Absorption Spectrometer (FLAA)

SVL calibrates FLAAs in accordance with analytical method requirements.

9.13 Ion Chromatograph (IC)

SVL calibrates ICs in accordance with EPA method 300.0. Five calibration standards and a calibration blank are analyzed. The instrument creates a linear or quadratic calibration curve that must have a correlation coefficient of at least 0.995 An ICV from a secondary source follows to verify the calibration. An ICB indicates the system is clean. An RLCS indicates that the results derived at the reporting limit can be recovered within our acceptance criteria. A CCV and a CCB

follow after every ten samples and at the end of the analytical sequence. The acceptance criteria are defined in SOP SVL 4122.

9.14 Flow-Injection Auto Analyzer (FIA)

SVL calibrates FIAs in accordance with EPA methods 335.4 (Total Cyanide), 350.1 (Ammonia), **351.2 TKN**, 353.2 (Nitrate and Nitrite), 9012B (Total Cyanide), and Standard Methods 4500-CN-I (WAD Cyanide), and method OI 1677 (Amperometric Cyanide). A minimum of five calibration standards and a calibration blank are analyzed at the beginning of each analytical sequence. The instrument software creates a linear or quadratic calibration curve that must have a correlation coefficient of at least 0.995. A Laboratory Control Sample (LCS) and an ICV from a secondary source verifies the calibration curve. An ICB indicates the system is clean. An RLCS indicates that the results derived at the reporting limit can be recovered within our acceptance criteria. Analysis of a CCV and a CCB follow after every ten samples and at the end of the analytical sequence. The acceptance criteria are defined in SOPs SVL 4012, **SVL 4045**, SVL 4099, SVL 4048, SVL 4075, and SVL 4101.

9.15 Total Organic Carbon Analyzer (TOC)

SVL calibrates TOC analyzers in accordance with SM 5310 B. Three calibration standards for total carbon and three calibration standards for inorganic carbon are analyzed to prepare a calibration curve that must have a correlation coefficient of at least 0.995. An RLCS indicates that the results derived at the reporting limit can be recovered within our acceptance criteria. A CCV is analyzed at the beginning of each analytical sequence, after every ten samples and at the end of the analytical sequence. The acceptance criteria are defined in SOP SVL 4116.

9.16 UV/Visible Spectrophotometers (UV/VIS)

SVL calibrates its UV/Visible spectrophotometer in accordance with the applicable published methods. A minimum of three calibration standards and a calibration blank are analyzed at the beginning of each analytical sequence. The calibration curve must have a correlation coefficient of at least 0.995.

9.17 pH and Ion Selective Electrode Meters (ISE)

SVL calibrates pH and ISE meters in accordance with the applicable published methods. For TKN, SVL uses an Excel spreadsheet to create a calibration curve of potential (mV) versus log of concentration.

9.18 Class A Glassware

Class A glassware is verified, assigned a unique identifier and logged in upon receipt as described in SOP SVL 1026.

10.0 SAMPLING, SAMPLE RECEIVING, AND STORAGE

10.1 Sampling

SVL does not conduct sampling. Sampling procedures and contamination in the field are beyond SVL's control. SVL recommends the following procedures to its clients.

Sample preservation is critical for sample integrity. Chemical and biological reactions may occur that begin to change some chemical species upon sample collection. Unfortunately, for most samples, immediate analysis is neither economically feasible nor logistically possible. Although no chemical preservative exists that is valid for every parameter, SVL strongly recommends the preservation methods, container type, sample size and estimated maximum holding times for collection of water and wastewater samples summarized in Table 1. Solid samples are best preserved by cooling the sample to a range between **4º C ± 2°C for CLP samples and between 0°C and 6°C for non CLP samples.**

Table 1

Analysis	Volume Required (mL)	Container	Preservative	Holding Time
Color	50	P,G	Cool to ≤ 6 °C	48 Hours
Conductance	100	P,G	Cool to ≤ 6°C	28 Days
Hardness	100	P,G	HNO_3 to pH<2	6 Months
Odor	300	G only	Cool to ≤ 6°C	24 Hours
pH	25	P,G	None Required	* ASAP
Temperature	1000	P,G	None Required	* ASAP
Turbidity	100	P,G	Cool to ≤ 6 °C	48 Hours

Analysis	Volume Required (mL)	Container	Preservative	Holding Time
Filterable Residue (TDS)	100	P,G	Cool to ≤ 6 °C	7 Days
Non-Filterable Residue (TSS)	100	P,G	Cool to ≤ 6 °C	7 Days
Total Residue	100	P,G	Cool to ≤ 6 °C	7 Days
Volatile Residue	100	P,G	Cool to ≤ 6 °C	7 Days
Settleable Matter	1000	P,G	Cool to ≤ 6 °C	48 Hours
Dissolved Metals	200	P,G	Filter on site; HNO_3 to pH<2	6 Months
Total Metals	100	P,G	HNO_3 to pH<2	6 Months
Chromium (VI)	200	P,G	Cool to ≤ 6 °C	24 Hours
Mercury, Dissolved	100	P,G	Filter; HNO_3 to pH<2	28 Days
Mercury, Total	100	P,G	HNO_3 to pH<2	28 Days **26 Days (CLP)****
Acidity	100	P,G	Cool to ≤ 6 °C	14 Days
Alkalinity	100	P,G	Cool to ≤ 6 °C	14 Days
Bromide	100	P,G	None Required	28 Days
Chloride	50	P,G	None Required	28 Days
Cyanide	500	P,G	Cool to ≤ 6 °C; NaOH to pH>12	14 Days **12 Days (CLP)****
Fluoride	300	P	None Required	28 Days
Ammonia	400	P,G	Cool to ≤ 6 °C H_2SO_4 to pH<2	28 Days
Total Kjeldahl Nitrogen	500	P,G	Cool to ≤ 6 °C H_2SO_4 to pH<2	28 Days
Nitrate plus Nitrite	100	P,G	Cool to ≤ 6 °C H_2SO_4 to pH<2	28 Days
Nitrate	100	P,G	Cool to ≤ 6 °C	48 Hours
Nitrite	50	P,G	Cool to ≤ 6 °C	48 Hours
Ortho-Phosphate Dissolved	50	P,G	Filter on site; Cool to ≤ 6 °C	48 Hours
Total Phosphate	50	P,G	Cool to ≤ 6 °C; H_2SO_4 to pH<2	28 Days
Total Dissolved Phosphate	50	P,G	Filter on site; Cool to ≤ 6 °C; H_2SO_4 to pH<2	28 Days
Silica	50	P only	Cool to ≤ 6 °C	28 Days
Sulfate	50	P,G	Cool to ≤ 6 °C	28 Days
Sulfide	500	P,G	Cool to ≤ 6 °C add 2 mL zinc acetate plus NaOH to pH>9	7 Days
COD	50	P,G	Cool to ≤ 6 °C H_2SO_4 to pH<2	28 Days

Analysis	Volume Required (mL)	Container	Preservative	Holding Time
Total Organic Carbon	25	**40 mL amber vials**	Cool to ≤ 6 °C H_2SO_4 to pH<2	28 Days
Phenolics	500	G only	Cool to ≤ 6 °C H_2SO_4 to pH<2	28 Days
MBAS	400	P,G	Cool to ≤ 6 °C	48 Hours

* pH and temperature should be measured in the field whenever possible. They are subject to rapid change. Measurements of pH and temperature made in the laboratory will almost always be out of holding time.

**** CLP SOW ILMO5.4 holding times are measured from Validated Time of Sample Receipt (VTSR).**

SVL has formed alliances with other laboratories for the analysis of organic parameters. The recommended containers and preservatives are

Analysis	Amount Required	Container	Preservative	Holding Time Until Extraction	Holding Time After Extraction Until Analysis
Mercury, Low Level***					
524.2 (Volatile Organic Compounds)	3x40mL vials	G,T	Cool to ≤ 6 °C; HCl to pH<2	14 days	NA
608 (Pesticides and/or PCBs)	3 L	amber G,T	Cool to ≤ 6 °C	7 days	40 days
624 (Volatile Organic Compounds)	3x40mL vials	G,T	Cool to ≤ 6 °C; HCl to pH<2	14 days	NA
625 (Semi-volatile Organic Compounds)	3 L	amber G,T	Cool to ≤ 6 °C	7 days	40 days
1664 Hexane Extractable Materials	2L	G only	Cool to ≤ 6 °C H_2SO_4 or HCl to pH<2	28 days	NA
8081A (Pesticides)	8 oz (soil) 1L (aqueous)	amber G,T	Cool to ≤ 6 °C	14 days 7 days	40 days
8082 (PCBs)	8 oz (soil) 1 L (aqueous)	G,T	Cool to ≤ 6 °C	14 days 7 days	40 days
8260B (Volatile Organic Compounds)	4 oz (soil) 3x40mL (aq)	G,T	Cool to ≤ 6 °C; HCl to pH<2	14 days	NA
8270C (Semi-volatile Organic Compounds)	8 oz (soil) 1 L (aqueous)	amber G,T	Cool to ≤ 6 °C	14 days	40 days
8015 (TPH-Gasoline)	4 oz (soil) 3x40 mL (aq)	amber G,T	Cool to ≤ 6 °C; HCl to pH<2	14 days	35 days

Analysis	Amount Required	Container	Preservative	Holding Time Until Extraction	Holding Time After Extraction Until Analysis
Mercury, Low Level***					
8015AZ ****	8 oz (soil)	G,T	Cool to ≤ 6 °C	48 hours	14 days for extraction and analysis
8260BAZ****	4 oz (soil)	G,T	Cool to ≤ 6 °C	48 hours	NA
8015 (TPH-Diesel Motor Oil)	1 L (aq) 8 oz (soil)	amber G,T	Cool to ≤ 6 °C: HCl to pH<2	14 days	40 days

*** Call for sampling and hold time requirements.
**** TPH 8015AZ and 8260AZ (soils) have a 48 hour hold time before extraction.

10.1 Sampling Cont'd

Field blanks allow for identification of systematic and random sample contamination that may result from the sampling equipment, storage containers, sampling agents, or chemicals added to preserve samples. Field blanks consist of a sample container of distilled or deionized water with the appropriate chemical preservative. Preservation, filtration, storage, handling, and analysis are performed as if the field blanks were samples. To achieve accurate and meaningful data, field blank containers should be filled with analyte-free water and the appropriate preservative at the sampling site.

Sources of sample contamination include unclean sample containers and filters; impure solvents and reagents; and use of cleaning products inappropriate for the proposed analysis. Hair, tobacco smoke, and dust also are appreciable sources of contamination, so sampling should be conducted in as careful a manner as possible.

Before filtering samples for dissolved parameters, the filter paper should be rinsed with de-ionized or distilled water and with a small portion of sample. The filtration apparatus should also be rinsed with de-ionized or distilled water between samples. Handle filter paper only on the edge, using appropriate forceps (plastic for trace metals analysis).

Use the proper sample container for the parameter specified. Samples for trace metals analysis must not come into contact with any metallic surface; samples for organic analysis must not come into contact with any plastic surface.

Sampling personnel should complete a COC form that documents sample identification, sampling date and time, matrix type, number of

sample containers, type of preservation, whether samples have been filtered, and the parameters to be analyzed.

10.2 Sample Receiving and Storage

SOPs SVL 2001, SVL 2003, and SVL 2004 describe sample receiving, job creation, and sample storage, respectively.

SVL takes a temperature reading from the sample shipping containers (coolers) upon receipt and opening. Each sample is checked for visible damage and the presence of an intact custody seal (if required). SVL gives each group of samples a unique job number (e.g., "W8L0202"). This job number remains with the samples throughout the analytical process. Each sample is assigned a unique, sequential identification number. Samples are labeled with a bar code (containing both the sample and job numbers) before storing the sample under the proper preservation requirements.

Samples that require refrigeration are stored in walk-in coolers (which are kept between 0ºC and 6°C), except during times of sample preparation or analysis. Samples that do not require refrigeration are stored in an ambient temperature storage room. The laboratory does not refrigerate soil samples that were received without refrigeration. Samples are retained by SVL for a minimum of 30 days (or longer if required by the client) after a data report has been issued to the client. At the end of the specified period, samples are returned to the client or discarded in an appropriate manner (see SOPs SVL 1001 and 1008).

Sample custodians, technicians and analysts use the custody log feature of the LIMS to track sample movement during receipt, preparation, analysis and disposal. SVL personnel are responsible for logging the samples into their custody. They then assume accountability for the sample(s). When use of the sample is complete, personnel must scan samples back into the appropriate home location or another employee may assume custody by scanning/logging the sample into their custody via the LIMS.

10.3 Sub-sampling

Sub-sampling is described in SOP SVL 2018.

10.4 Sample Disposal and Hazardous Waste

Procedures for sample disposal are described in SOP SVL 1001. Disposal procedures follow federal and state regulatory requirements. SVL's hazardous waste program is described in SOP SVL 1008.

11.0 EQUIPMENT AND INSTRUMENTS

SVL uses the following instruments to generate analytical data and to calibrate other instruments.

11.1 SVL performs instrument maintenance as recommended by the manufacturer. SVL maintains service contracts with vendors for its major analytical instrumentation. Maintenance logbooks are kept to provide a record of major and minor repairs; as well as, preventative maintenance.

11.2 The analysts and supervisors will determine if a repair has created a need to update instrument MDLs, linear ranges, calibrations etc.

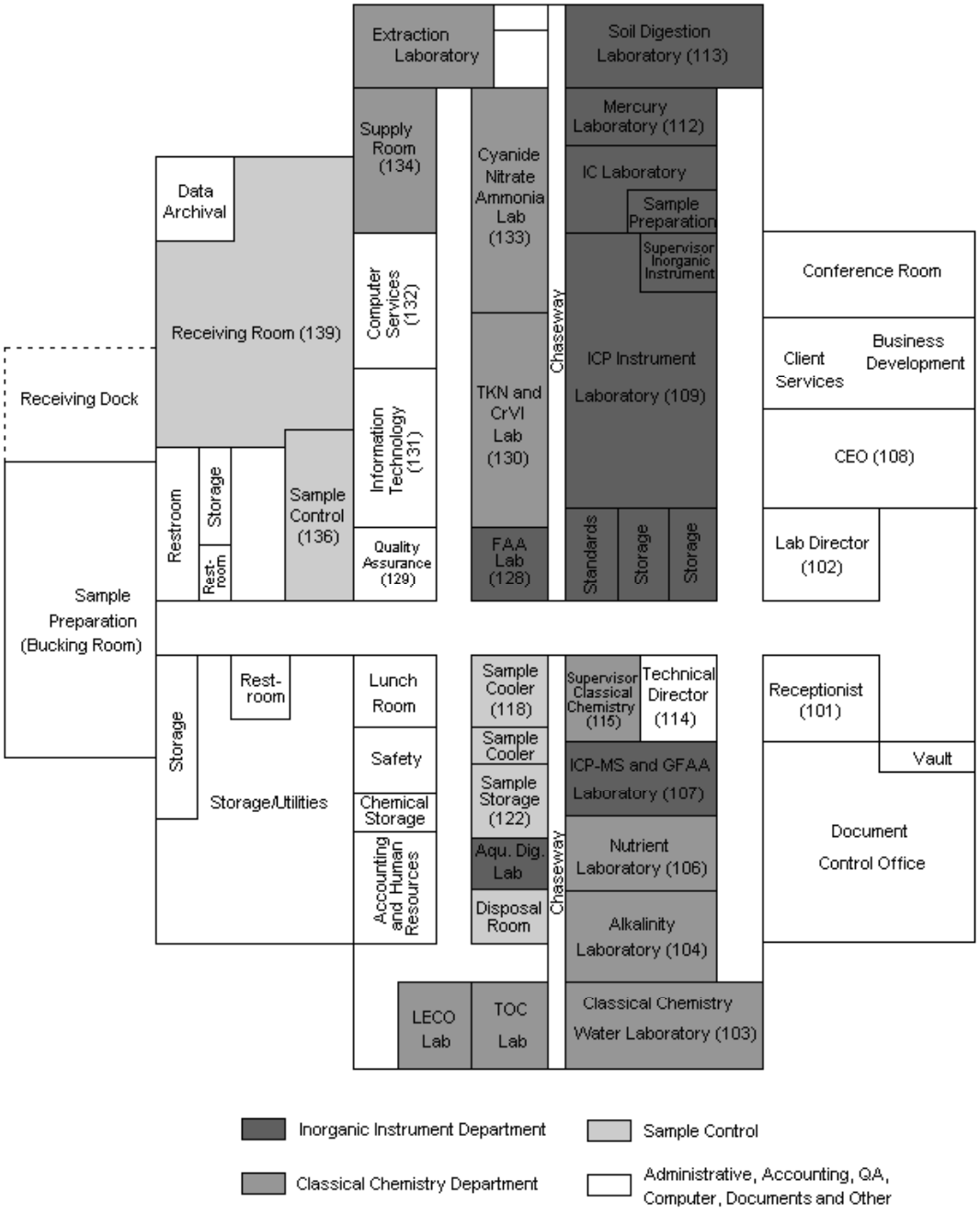
11.3 In the event that SVL's ICP-MS instrument becomes non-operational, SVL's Technical Director shall contact CLP-SMO for instructions on how to proceed. This situation, should it occur, may require forwarding samples requiring ICP-MS to an alternate CLP contract laboratory.

INSTRUMENT	MANUFACTURER	MODEL	SERIAL NUMBER
Spectrometer (ICP-MS)	Perkin-Elmer	ELAN 5000	W0660402
Spectrometer (ICP) Optima 1	Perkin-Elmer	Optima 4300	077N0061602
Spectrometer (ICP) Optima 5	Perkin-Elmer	Optima 5300	077N5011902
Spectrometer (ICP) Optima 6	Perkin-Elmer	Optima 5300	077N6062101
Spectrometer (ICP) Optima 7	Perkin-Elmer	Optima 5300	077C8011601
Spectrometer (ICP) Optima 8	**Perkin-Elmer**	**Optima 7300**	**077C9031902**
Atomic Absorption Spectrometer with Graphite Furnace	Perkin-Elmer	Analyst 600	601S3090501
Atomic Absorption Spectrometer with Vapor Generation Assembly	Varian	AA 55B	EL03048142
Mercury Analyzer with Autosampler	CETAC	M-6000A	029907MAS
Mercury Analyzer with Autosampler	CETAC	M-7500	110801QTA
11 DIgestor Blocks	Environmental Express	Hot Block	
Ion Chromatograph	Dionex	ICS90	4090417
INSTRUMENT	**MANUFACTURER**	**MODEL**	**SERIAL NUMBER**

Ion Chromatograph	Dionex	ICS900	08041118
Ion Chromatograph	Dionex	DX-100	921517
Ion Chromatograph	Dionex	4000i	14421
Automated Flow Analyzer	Alpkem	FS3000	843-1604-758
Automated Flow Analyzer	**Astoria Pacific**	**2-A**	**200220**
Flow Analyzer Autosampler	**Astoria Pacific**	**111**	**070903A130**
2 Micro Distillation Units	Lachat	ID 001	A2000-828 and 081100001017
3 MIDI Distillation Units	BSL		
2 Ammonia Distillation Units	Andrews Glass		
Ammonia/N analyzer	Astoria Pacific	A2	200104
Automated Flow Analyzer	Alpkem	Alpkem TKN	As. # INS0036HW
Block Digestor	Westco Scientific	Easy Digest 40/20	As. # INS0030HW
Auto Titrator with Autosampler	Metrohm	Titrino 809 Titrando	
Auto Titrator with Autosampler	Metrohm	Titrino 809 Titrando	18090010-07108
UV/Visible Spectrophotometer	Genesys	10	205G261004
UV/Visible Spectrophotometer	Spectronic	501	0283085
Turbidimeter	Hach	2100	95041453
COD Reactor	VELP Scientifica	ECO 25	101448
COD Reactor	Hach	COD	971100016584
pH/Ion Meter	Corning	450	001246
pH/Ion Meter	Corning	150	2173
pH Meter	Accumet	AB15	AB92314557
pH Meter	Beckman		224148
pH Meter	Beckman	11 pH Meter	0224055
pH Meter	Thermo	Orion 2 Star	B06039
pH Meter	Thermo	Orion 320	019525
Dissecting Microscope	Nikon	104	
Polarizing Microscope	Nikon	106	
Centrifuge	Beckman	GS-6 Centrifuge	
Flashpoint detector	Precision Scientific	74537	108A-2
Conductance Meter	Fisher	AB30	AB 92315548
Conductance Meter	**Orion**	**115**	**002176**
Elemental Analyzer	LECO	SC632	3208
Carbon/Nitrogen Analyzer (TOC)	Shimadzu	TOC-VCSH-N	37401162
Semi-Micro Balance	Mettler	AE-240	K89952
Semi-Micro Balance	Mettler	AE-240	G43270
Filter Balance	Mettler	AJ100	N09817
Analytical Balance	Mettler	PJ 360	F89531
Analytical Balance	Mettler	PJ 360	G49684
Analytical Balance	**Mettler**	**PB30**	**A04506**
Analytical Balance	**Mettler**	**PJ360**	**F39533**
Analytical Balance	Mettler	BB 240	L96134
Analytical Balance	**Ohaus**	**EOF110**	**F2221120252601**
INSTRUMENT	**MANUFACTURER**	**MODEL**	**SERIAL NUMBER**
Analytical Balance	Ohaus	AR2140 Adventurer	H2131203121033P

Analytical Balance	Ohaus	AR1530 Adventurer	1203200181P
Analytical Balance	Ohaus	N1D110 Navigator	1122352966
Analytical Balance	Ohaus	AS 513	8028301193
Analytical Balance	**Leco**	**050**	**329**
IR Thermometer	Raytek	Raynger	93660090
IR Thermometer	**Control Company**	**15-077-57**	**90724477**
Thermometer	HBI	68ºC to 86ºC	4B1321
Thermometer	Ertco	-20ºC to 110ºC	5283
Thermometer	**HB**	**-10º C to 225ºC**	**K61438**

12.0 FACILITIES



12.1 SVL is an analytical laboratory specializing in the performance of tests and methods used in the characterization of environmental and mining samples. Since 1972, SVL has analyzed water, soil, sediment, sludge, oil, paint, rock, animal tissue, vegetation, air filters, and various other sample types. SVL occupies a modern 25,000 square foot laboratory facility architecturally designed and specifically organized to ensure efficient operation and meet the needs of a large capacity analytical laboratory. Building access, security and safety features have been carefully considered. Access through the outside laboratory entrance and to internal areas is limited to laboratory staff and other essential personnel. Visitors are escorted during their stay at SVL.

13.0 STANDARD OPERATING PROCEDURES

SVL performs work in accordance with the requirements of its SOPs. SVL's SOPs are listed below and describe all aspects of its work performance including Safety and Quality Assurance (1000 Series), Sample and Document Management (2000 Series) and Inorganic Analysis (4000 Series).

SOP NUMBER	DESCRIPTION
SVL 1001	SAMPLE DISPOSAL
SVL 1002	WRITING AND REVISING STANDARD OPERATING PROCEDURES
SVL 1004	CALIBRATING THERMOMETERS
SVL 1005	INTERNAL QUALITY ASSURANCE AUDITS
SVL 1007	SOIL STERILIZATION
SVL 1008	DISPOSAL OF HAZARDOUS WASTE
SVL 1010	TRAINING
SVL 1011	PERFORMING AN MDL STUDY
SVL 1015	PROCUREMENT, RECEIVING, AND SUBCONTRACTING
SVL 1017	RECORDS RETENTION AND PROTECTION
SVL 1019	CORRECTIVE ACTION
SVL 1020	CALIBRATION FOR ANALYTICAL METHODS
SVL 1021	MANUAL INTEGRATION
SVL 1023	SOFTWARE VERIFICATION
SVL 1025	CALIBRATING BALANCES
SVL 1026	CALIBRATING MICROPIPETS, REPIPETTORS, AND GLASSWARE
SVL 1027	CLIENT SERVICES
SVL 1028	CALCULATIONS FOR ANALYTICAL METHODS
SVL 1029	PERFORMANCE TESTING SAMPLES
SVL 1030	INITIAL, PERIODIC AND AFTER-MAINTENANCE CHECKS

SOP NUMBER	DESCRIPTION
SVL 1031	COMPUTER AND INFORMATION SECURITY POLICY
SVL 1032	CHEMICAL REAGENTS, PREPARED STANDARDS, AND QC SOLUTIONS
SVL 1033	ACCEPTANCE LIMITS AND TRENDING
SVL 2001	SAMPLE RECEIVING
SVL 2003	SVL JOB CREATION
SVL 2004	SAMPLE STORAGE AND SECURITY
SVL 2006	DATA CORRECTIONS
SVL 2007	CASE FILE ASSEMBLY
SVL 2007-ILMO5.4	CASE FILE ASSEMBLY ILOM5.4
SVL 2009	DATA REVIEW
SVL 2013	DATA PACKAGE PRODUCTION
SVL 2015	LEVEL 3 – CLP DATA PACKAGE
SVL 2017	LOGBOOK CONTROL
SVL 2018	PREPARATION AND SUBSAMPLING OF EARTH, ROCK, AND TISSUE SAMPLES
SVL 2019	REANALYSIS PROCEDURES
SVL 2020	**COMPUTER-RESIDENT SAMPLE DATA CONTROL**
SVL 2021	**DATA BACKUP AND RESTORE**
SVL 4010	DETERMINATION OF MERCURY (CVAA)
SVL 4010-ILMO5.4	DETERMINATION OF MERCURY (CVAA) BY ILMO5.4
SVL 4012	TOTAL CYANIDE BY MIDI DISTILLATION FOLLOWED BY AUTOMATED COLORIMETRY
SVL 4012-ILMO5.4	TOTAL CYANIDE BY MIDI DISTILLATION FOLLOWED BY ILMO5.4
SVL 4013	GLASSWARE WASHING FOR CLASSICAL CHEMISTRY AND TRACE METALS
SVL 4021	FILTER DIGESTION
SVL 4022	PERCENT SOLIDS/PERCENT MOISTURE
SVL 4024	COLOR
SVL 4025	CONDUCTIVITY
SVL 4026	TURBIDITY (METHOD 180.1)
SVL 4028	PH
SVL 4029	SPECIFIC GRAVITY
SVL 4031	ACIDITY
SVL 4032	SULFIDES BY TITRATION
SVL 4034	TOTAL DISSOLVED SOLIDS AND SUSPENDED SOLIDS
SVL 4035	TOTAL AND VOLATILE SOLIDS
SVL 4037	METHYLENE BLUE ACTIVE SUBSTANCES
SVL 4040	TOTAL PHOSPHORUS (AQUEOUS SAMPLES)
SVL 4042	ORTHO-PHOSPHATE (AS P)

SOP NUMBER	**DESCRIPTION**
SVL 4043	CHEMICAL OXYGEN DEMAND
SVL 4044	TOTAL ORGANIC MATTER
SVL 4045	TOTAL KJELDAHL NITROGEN
SVL 4048	NITRATE/NITRITE AS N: AUTOMATED CADMIUM RE REDUCTION
SVL 4049	CATION EXCHANGE CAPACITY BY METHOD 9081
SVL 4056	FREE CYANIDE BY METHOD 4500-CN F
SVL 4060	LOSS ON IGNITION (SVL METHOD)
SVL 4061	DETERMINATION OF ACID GENERATING POTENTIAL (AGP), ACID NEUTRALIZATION POTENTIAL (ANP), AND ACID BASE ACCOUNTING (ABA)
SVL 4065	METEORIC WATER MOBILITY EXTRACTION
SVL 4068	SYNTHETIC PRECIPITATION LEACHING PROCEDURE (SPLP)
SVL 4070	TOTAL SUSPENDED PARTICULATES
SVL 4075	WAD CYANIDE BY MIDI DISTILLATION FOLLOWED BY SEMI-AUTOMATED COLORIMETRY
SVL 4078	SAMPLE DIGESTION FOR TOTAL METALS IN AQUEOUS SAMPLES FOR ICP-MS (EPA METHOD 3020A)
SVL 4079	SAMPLE DIGESTION FOR TOTAL METALS IN AQUEOUS SAMPLES FOR ICP (3010A)
SVL 4080	SAMPLE DIGESTION FOR TOTAL RECOVERABLE METALS IN AQUEOUS SAMPLES FOR ICP (3005A)
SVL 4082	ARSENIC SPECIATION (ASIII AND ASV)
SVL 4084	DETERMINATION OF ALKALINITY AND pH USING THE AUTOTITRATOR
SVL 4093	CASSETTE FILTER DIGESTION
SVL 4094	SAMPLE DIGESTION FOR METALS IN SOILS (EPA METHOD 3050B)
SVL 4095	FLASHPOINT PENSKY-MARTENS CLOSED TESTER
SVL 4096	pH DETERMINATION FOR SOILS AND PASTE
SVL 4097	TOTAL SULFUR, TOTAL CARBON
SVL 4099	AMMONIA BY SEMI-AUTOMATED COLORIMETRY
SVL 4101	ANALYSIS OF AVAILABLE CYANIDE BY FLOW INJECTION AND AMPEROMETRY (METHOD 1677)
SVL 4102	ANALYSIS OF METALS BY METHODS 6010B AND 200.7 USING THE PERKIN-ELM OPTIMA ICP
SVL 4102-ILMO5.4	ANALYSIS OF METALS BY ILMO5.4 USING THE PERKIN-ELM OPTIMA ICP
SVL 4105	SELENIUM BY HYDRIDE
SVL 4106	SAMPLE DIGESTION FOR TOTAL RECOVERABLE METALS IN AQUEOUS SAMPLES BY ICP (200.2)
SVL 4107	SAMPLE DIGESTION FOR TOTAL METALS IN AQUEOUS SAMPLES BY ICP AND GFAA (40CFR136 APPENDIX C 9.3)
SVL 4108	SAMPLE PREPARATION FOR ANALYSIS OF DIRECT ANALYSIS, DRINKING WATER,DISSOLVED AND POTENTIALLY DISSOLVED METALS IN AQUAEOUS SAMPLES
SVL 4111	ANALYSIS OF METALS BY ICPMS (METHOD 200.8)
SVL 4111-ILMO5.4	ANALYSIS OF METALS BY ICPMS (METHOD 200.8) BY ILMO5.4

SVL 4112	ANALYSIS OF METALS BY ICPMS (METHOD 6020)
SOP NUMBER	**DESCRIPTION**
SVL 4114	TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)
SVL 4116	TOTAL ORGANIC CARBON
SVL 4118	CALIFORNIA WASTE EXTRACTION TEST (CA-WET)
SVL 4119	PREPARATION OF QC SOLUTIONS FOR METALS ANALYSIS
SVL 4120	TOTAL NITROGEN
SVL 4121	DETERMINATION OF THRESHOLD ODOR NUMBER (TON) SM 2150B
SVL 4122	INORGANIC ANIONS BY CHROMATOGRAPHY USING THE DIONEX DX 100 , ICS-90 AND ICS-900
SVL 4123	ASTM D-2795 AND D-3682-78 SOLID SILICA
SVL 4124	OPERATION OF PERKIN/ELMER GFAA: ANALYSIS OF GOLD BY GRAPHITE FURNACE
SVL 4125	SM 3500 Cr B and D; HEXAVALENT CHROMIUM

13.1 Deviations

Occasionally, a deviation from an SOP is required to generate an accurate result for a given test or client. This may occur when a client specifically requires a modification, or when the sample matrix interferes with the analysis. The Laboratory Director or a Department Supervisor may authorize a deviation. The analyst documents details of the deviation from the SOP on the instrument raw data printout or the job bench sheet with a notation in the work order memo in Element.

14.0 QUALITY CONTROL

14.1 Quality Control Parameters

SVL uses a number of quality control parameters to validate calibration, and to measure contamination, accuracy, and precision. Each SVL SOP defines the parameters required for the method being used.

14.1.1 Blanks

Method Blank Is an aliquot of analyte-free water that is put through all the steps of a specific method along with the samples. It is sometimes called a Laboratory Reagent Blank.

Calibration Blank The zero-concentration standard analyzed as part of a calibration curve.

Field Blank Randomly selected sample container that is filled with analyte-free water and the appropriate chemical preservative in the field.

Trip Blank Is a specific type of field blank. A trip blank is not opened in the field. It is a check on sample contamination from the time the container is sealed at the lab or supplier. It is used to verify the container's integrity during sample transport and the container's time on site (it should always be with sampling group).

The acceptance criterion for a blank may be set by the published method, by client Data Quality Objectives (DQOs), or by historical statistics. In the absence of these directives, the acceptance criterion may default to less than the reporting limit.

14.1.2 Matrix Spike

Is an aliquot of sample to which a known amount of analyte has been added prior to sample preparation or digestion. It is a measure of the effect of the sample matrix on the analytical method. It is sometimes called the "Laboratory Fortified Matrix".

The recovery is calculated by:

% Recovery = 100 x (MS – S) / SA

Where the MS = Spiked Sample Result
S = Sample Result
SA = Spike Added

Acceptance criteria for the matrix spike recovery may be determined by the published method, by client DQOs, or set between 70-80 to 120-130%. For those methods without guidelines the QA Manager will set default limits for the acceptance range. Individual SOPs will have the recovery range acceptance requirements. There are no requirements if the concentration of the analyte in the original sample is greater than five times the concentration of the spike.

14.1.3 Analytical Spike or Post-Digestion Spike

Is an aliquot of sample to which a known amount of analyte has been added after sample preparation. It is a measure of the effect of the matrix on a digestate or extract.

14.1.4 Laboratory Control Sample (LCS)

Is a solution or material of known concentration that is added to an analyte free matrix and then analyzed to evaluate the recovery and accuracy of a method. It is sometimes called a Laboratory Fortified Blank.

Acceptance criteria for the LCS recovery may be determined by the published method, by the manufacturer of the standard, by client DQOs or the QA Manager will set default limits.

14.1.5 Sample Duplicate

A second similar aliquot of a sample treated exactly the same through preparation and analysis. The Relative Percent Difference (RPD) between the values of the duplicates is a measure of the precision of the analytical method.

$$RPD = 100 \times | S - D | / [(S + D)/2]$$

The acceptance criterion for the RPD is usually set at 20%, if the concentration in the sample is greater than five times the reporting limit. There is no acceptance criterion if the sample concentration is less than five times the reporting limit.

14.1.6 Matrix Spike Duplicate (MSD)

A second similar aliquot that is spiked, it is treated exactly the same as the first matrix spike (MS) through preparation and analysis. The RPD between the recovery values is a measure of the precision of the analytical method.

$$RPD = 100 \times | MSD - MS | / [(MSD + MS) / 2]$$

14.1.7 Interference Check Sample (ICS)

A sample with known concentrations of elements used to determine if the inter-element correction factors are valid.

14.1.8 Initial Calibration Verification (ICV)

A standard made from a second source from the calibration standards. It is analyzed immediately after the calibration to determine the validity of the calibration standards.

14.1.9 Continuing Calibration Verification (CCV)

A calibration standard (primary or secondary source) analyzed after every ten samples, and at the end of an analytical sequence to verify that the calibration is still valid.

14.1.10 Reporting Limit Check Sample (RLCS)

A check standard that is constructed out of either a primary or secondary source made up at same concentration as the reporting limit. An acceptance range of +/- 30% for single analyte methods and +/- 50% for multi-analyte methods was made the default. RLCS results are batched as a Standard Reference Material (SRM) which can be pulled into Element for control charting purposes.

14.1.11 Initial Calibration Blank (ICB)

A matrix matched deionized water sample ran to prove the system is clean with no carry-over.

14.1.12 Continuing Calibration Blank (CCB)

A matrix matched deionized water sample ran to prove the system is clean with no carry-over.

14.1.13 Serial Dilution

Dilute a sample by a minimum of five fold (1+4). Agreement within 10% between the concentration for the undiluted sample and five times the concentration for the diluted sample indicates the absence of interferences.

14.2 Control Charts

SVL utilizes Element, to provide its personnel with the up to the minute ability to trend inputted QC results. It is recommended that analysts and technicians regularly consult trending charts to provide themselves with real time information. By trending an analysis, the analyst or technician can look at a current or past snapshot of QC recoveries and possibly determine when prep procedures or QC samples were done incorrectly or used contaminated or expired components. Trending can also be used to show when an instrument's components begin to degrade or fail.

The process is defined in SOP SVL 1033. RLCSs, prep blanks, LCSs, duplicates and matrix spikes are tracked. A standard X bar control chart is used to plot results. Upper and lower warning limits of ±2s (where s equals standard deviation) and upper and lower control limits of ±3s are calculated with no fewer than 20 measurements in a 6 month period. Method defaults are used when not enough points are generated during a 6 month period.

14.3 Acceptance Limits

Acceptance limits for quality control parameter recoveries may be set by published analytical methods, DQOs or be default limits set by the QA Manager. Individual SOPs will provide the accepted recoveries for each method. Acceptance limits are also outlined in SOP SVL 1033.

14.4 General Frequency of Quality Control Checks

For those methods that do not have published QC requirements, SVL will use the following QC and frequency if applicable per batch of 20 samples:

Initial Calibration Verification once per calibration.

Initial Calibration Blank once per calibration.

Reporting Limit Check Standards at a frequency of 1 per analytical run.

Method or Instrument Blanks at a frequency of 5%.

Laboratory Fortified Blank or LCS at a frequency of 5%.

Duplicates at a frequency of 10%.

Matrix Fortified Samples at a frequency of 10%.

Continuing Calibration Verification every ten samples.

Continuing Calibration Blank every ten samples.

14.5 Uncertainty of Measurement

SVL uses control charting as a means of determining when selected parameters are out of control. Warning and unacceptable control limits are defined at 2 and 3 sigma, respectively. See 14.2 and SOP SVL 1033.

Almost all approved methods used at SVL contain a section related to precision and bias. Random uncertainties that are systemic cannot be determined statistically and can only be estimated by a trained analyst. Uncertainty represents a bias associated with analytical measurements. The presence and magnitude of bias can be determined by assessment of SVL's control sample results.

SVL reports out data to 3 significant numbers, with the number of decimal places determined by the sensitivity of the method.

15.0 CORRECTIVE ACTION

The SVL Corrective Action Program is defined in SOP SVL 1019.

When a QC parameter fails acceptance criteria during the course of analysis, the analyst or supervisor resolves the problem before reporting data. The Supervisor may arrange for service or repair of instrumentation, if needed.

Any employee may initiate a Corrective Action Report (CAR) to support the quality system. Typical reasons are the need for an SOP revision, overdue MDL study, overdue training, incorrect data reduction or review, improper instrument calibration, or use of an incorrect analytical method.

If there is a non-acceptable result in a Performance Test Sample, the QAM documents the failure as a CAR and works with the analysts and supervisors to discover the root cause. If there are findings from an internal or external audit, the QAM issues a CAR to appropriate staff members so they can prepare a corrective action plan.

15.1 Preventative Action

A "preventative action" is a pro-active process for dealing with a problem before it happens. It is taken to eliminate the cause of an undesirable situation in order to prevent its occurrence rather than a reaction to the identification of a problem or nonconformity. These actions are taken to reduce the probability that a potential problem will occur. They may also include contingencies to reduce the seriousness should a future problem occur. Subjects for "preventative action" may be implemented to address a weakness in the quality system that is not yet causing nonconformities and can be initiated internally or externally

(client complaints). The focus for preventative actions should be to avoid creating nonconformities, but may also lead to improved laboratory efficiencies.

SVL uses the CAR template to document ideas, plans or actions whether developed internally or externally. These reports are audited at a future date to ensure that the changes sought have been implemented and are effective.

16.0 COMPLAINTS

The Client Services Department strives to resolve all complaints from clients regarding analytical reports or service. Client Services contacts the appropriate Director, or Department Supervisor to investigate and resolve issues. Actions may include reanalysis of samples, explanations surrounding technical issues or lab procedures.

16.1 Reanalysis, whether requested by a client or SVL personnel must have justification. The reasoning behind the justification requirement is to provide a baseline level under which the reanalysis can be compared and to provide a means of tracking quality within the lab. Reanalysis performed in order to "result hunt" is not conducted by SVL, but re-analysis performed to confirm a possible error on the part of SVL or by any of the sample custodians listed on the chain of custody is valid. SVL will report out both values for a re-analysis if the sample results are scientifically indistinguishable and the client requests the new result or another report, such data will be accompanied by a case narrative or data qualifier. SVL will issue a corrected report with only the re-analysis values if it can be determined that an error has occurred on the part of SVL (when this occurs a CAR must be generated). Re-analysis requested on a method that has multiple analytes shall result in the sample being re-analyzed for all of the analytes originally requested (the other analytes may not be re-reported if it is shown that they are scientifically indistinguishable from one another). Work Order memos will be established when a client requests a reanalysis and may be updated throughout the reanalysis. Case narratives will be written up to explain any discrepancies between the original test and any re-analysis conducted. Samples that are re-analyzed in-house will have the reason for the request clearly identified on the re-analysis request form. Whether internal or external, the re-analysis request form must be filled out completely to assist with historical data re-construction and to assist in writing up case narratives or CARs. See SOP SVL 2019.

17.0 TRAINING

SVL conducts annual training in legal and ethical responsibilities for all staff members. SVL provides training sessions that are developed in order to provide staff members with tools in an ever changing environment. New employees will be given various types of training as soon as possible after their hire date.

SVL Management and Supervisors train staff members in laboratory safety. At a minimum this consists of an annual review of the Chemical Hygiene Plan. It also includes seminars on important safety issues throughout the year.

Staff members also receive training in the quality system and QM. At a minimum this consists of an annual review of the QM.

Department Supervisors ensure that staff is adequately trained to perform the analyses assigned to them. The process is defined in SOP SVL 1010. Training includes, as appropriate, quality control requirements, instrument operation, instrument maintenance, software operation, reading the published method, reading the applicable SVL SOPs, successful analysis of a performance evaluation sample, and completion of the Initial Demonstration of Capability (IDOC). When an IDOC is not defined by the analytical method, the QAM will create default criteria outlined in the training summary forms and included in the personnel files.. Upon completion of training, a Demonstration of Capabilities Certificate is placed within their personal file.

SVL Management defines the required elements for training for analytical methods. A Supervisor or a fully trained analyst provides training, when possible. If no fully trained analyst exists, an analyst may learn a new analysis by reading the appropriate method and instrument manual, then performing an IDOC.

During the training period, an analyst may produce data for clients under the supervision of a fully trained analyst. The Department Supervisor or a fully trained analyst must review and sign all trainee work produced.

17.1 To document continued proficiency, an analyst must perform one of the following tasks annually:

17.1.1 Successfully analyze a blind performance sample.

17.1.2 Complete another IDOC.

17.1.3 Successfully analyze a blank and four separately prepared LCSs.

17.2 Analysts and technicians who do not successfully complete a DOC within a year must complete an IDOC before being re-certified for a method.

18.0 ETHICS AND CONFIDENTIALITY

18.1 SVL is committed to providing its clients with accurate and defensible data and meeting all client requirements for data quality and integrity. To achieve our commitment, and as a condition for employment with SVL, all employees agree to follow SVL's policy regarding ethics and data integrity characterized but not limited to the items listed below.

18.1.1 All reported data, including dates and times, shall represent actual values obtained and are not modified or manipulated in any manner for which allowances have not been made for in the referenced method.

18.1.2 There will be no misrepresentation of another analyst's identity.

18.1.3 Altering the contents of logbooks and/or data sheets to misrepresent data is prohibited.

18.1.4 Altering any operating procedures or QC to make data "fit" is prohibited.

18.1.5 Failing to comply with SOPs without proper documentation and approval from the Laboratory Director and/or QAM is prohibited.

18.1.6 Any attempt to misrepresent data or events as they actually occur in the course of data production, review or reporting is prohibited.

18.1.7 Deleting files, whether electronic or hard copy of raw data that was used in a reported value is prohibited.

18.1.8 Engaging or being a party to any practice that ultimately misrepresents data or narratives in any way is prohibited.

18.2 SVL has established a zero-tolerance policy for improper, unethical, or illegal activities. Improper actions are defined as unapproved deviations from contract-specific or method-specific analytical practices. They may be intentional or unintentional. Unethical or illegal actions are defined as the deliberate falsification of analytical or quality assurance results where failed method or contractual requirements are made to appear acceptable. Some examples of improper, unethical, or illegal practices are listed below:

18.2.1 Improper use of manual integrations to meet calibration or method quality control criteria.

18.2.2 Intentional misrepresentation of the date or time of analysis.

18.2.3 Falsification of results to meet method requirements.

18.2.4 Reporting results without analysis.

18.2.5 Selective exclusion of data to meet quality control criteria (dropping calibration points).

18.2.6 Unwarranted manipulation of computer software.

18.2.7 Improper alteration of analytical conditions (changing voltages or run times).

18.2.8 Misrepresentation of quality control samples (not preparing them as samples).

18.2.9 Intentionally reporting results from one sample for those of another.

18.2.10 Reporting calibration or quality control data not linked to the reported samples.

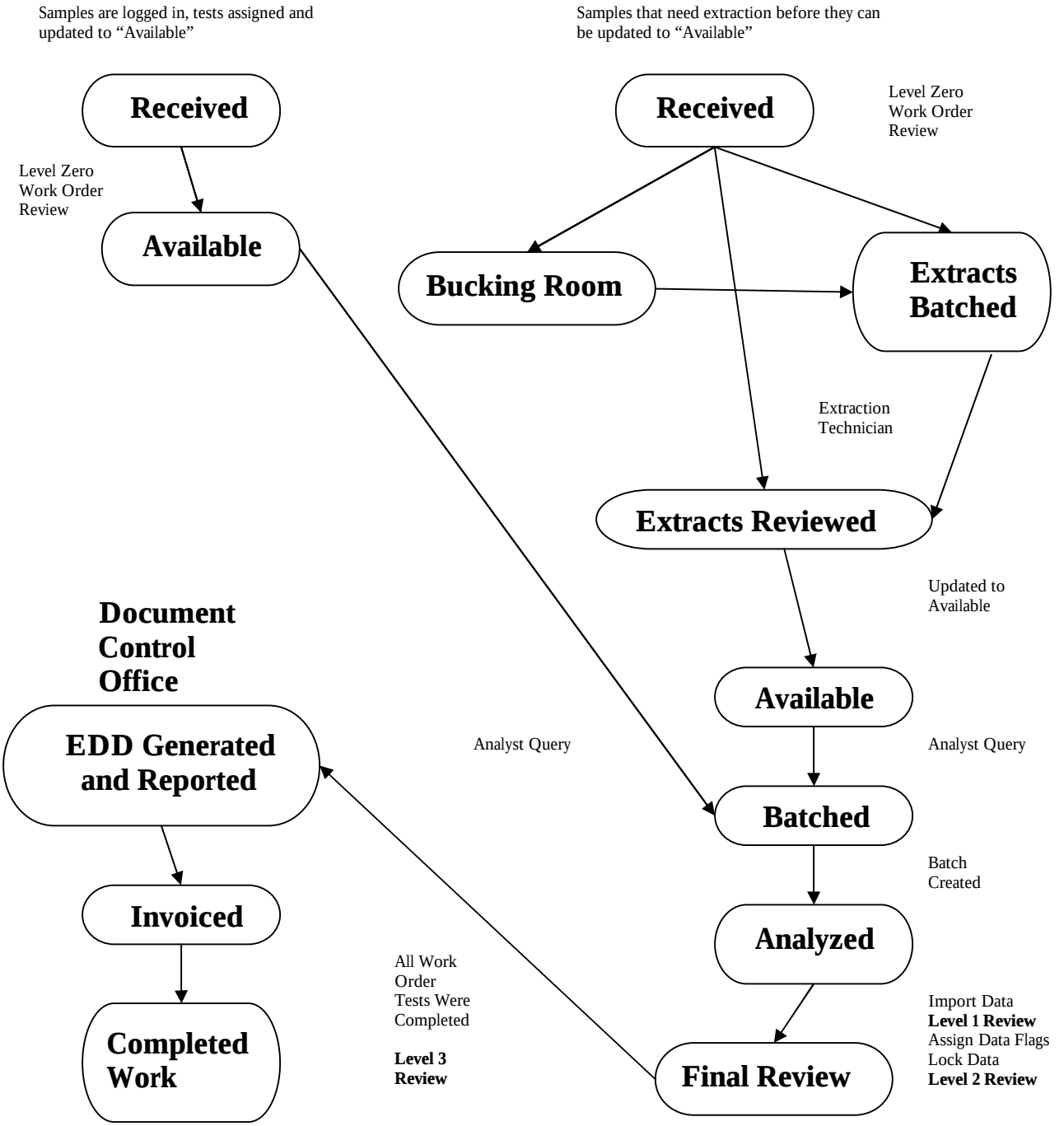
19.0 DATA REVIEW

SVL uses a three-tier system for data review via the LIMS system. The first level is conducted by the analyst, the second level by a peer or supervisor, the third by a signatory, DCO, Technical Director or the Laboratory Director. Reviews take place upon the review of raw data or within the LIMS system (which uses a system of locks to assure data is secure from accidental corruption). The process is governed by SOP SVL 2009.

In the case that erroneous data does leave the lab, the Laboratory Director or Client Services will contact the affected clients as soon as all of the facts are available. SVL will work with the clients in seeking a new or alternative strategy to meet the client's needs.

19.1 Data Review Flow Chart

Work Order Status **Analysis Status**


Samples are logged in, tests assigned and updated to "Available"
Samples that need extraction before they can be updated to "Available"
Received
Level Zero Work Order Review
Available
Received
Level Zero Work Order Review
Bucking Room
Extracts Batched
Extraction Technician
Extracts Reviewed
Updated to Available
Available
Document Control Office
EDD Generated and Reported
Analyst Query
Analyst Query
Batched
Batch Created
Invoiced
Analyzed
All Work Order Tests Were Completed
Level 3 Review
Import Data
Level 1 Review
Assign Data Flags
Lock Data
Level 2 Review
Completed Work
Final Review

20.0 REPORTING

SVL has a single standard report format for nearly all results (SVL_Sample) generated by Element. This includes a case narrative, sample report and QC report.

Reports are also available in a number of routine and custom hardcopy formats. Electronic Data Deliverables (EDD) can be provided in ASCII, spreadsheet, and database formats, including EQWin, GIS/Key, and EnviroData Solutions. If a client has a specific format, we are usually able to provide data that will merge with their preferred format.

Data that will be used to create EPA CLP-like deliverable packages may be done in Element or can be loaded into a third party data review and reporting system MARRS that will generate the forms required to complete a data package. SVL has the capability of providing a hardcopy and EDD format. EDDs are available in standard EPA CLP formats, as well as popular spreadsheet and database files.

21.0 AUDITS

21.1 Performance Testing Program

SVL participates in two WS, two SOIL, and two WP Performance Testing (PT) Studies each year. SVL uses the second WP Study to meet the DMRQA requirements of our clients. The PT samples are logged in as single-blinds and ran as if they were normal samples in all aspects.

21.2 Internal System Audits

The QAM conducts a minimum of one internal system audit per year. The audit provides an overview of the implementation of procedures and policies set forth in the laboratory's Quality Manual and SOPs; ref, SOP SVL 1005. System audits (that may be limited in scope) may be undertaken at any time in response to external audits, CARs, or at the request of the Laboratory Director.

The QAM prepares an internal audit plan based on information garnered from previous audits both internal and external, CARs, method changes, new instrumentation and requests or complaints from clients. The internal audit plan may define participating auditors, any applicable documents, the audit schedule, and scope of laboratory activities to be

audited. The QAM may use written checklists and/or quizzes to assess the analyst's knowledge of the QM, methods and current SVL SOPs.

The QAM will interview the analyst(s) and conduct reviews of records, logbooks, and data packages.

At the close of the audit, a post-audit meeting is held to discuss the audit findings. The auditor or Laboratory Director can close a finding during this discussion if the laboratory staff can satisfactorily demonstrate that the finding is inappropriate or easily remedied.

The QAM will deliver the report to the President, Laboratory Director and Technical Director. After review the report will be released to all of the parties involved. The report will contain at a minimum the following parameters: Date and location of the audit, personnel involved in the audit, laboratory operations audited, any minor or major findings that require corrective action (major findings require the issuance of a CAR) and the auditor's summation.

21.3 Data Audits

The QAM performs a data audit of several data packages each year. Data audits can also be triggered by audits, CARs or requests from the Laboratory Director. The purpose behind the data audits is to alert the QAM to any errors, chronic problems or trends that may be developing.

22.0 MANAGEMENT REVIEW

The Management of SVL conducts a review of the adequacy of the quality system and QM annually. The reviews takes into account reports from supervisory personnel, recent internal audits, external audits, the results of PT samples, changes to the volume or type of work undertaken, feedback from clients, and CARs. Conclusions reached are then incorporated into any revisions to the QM and in improvements in laboratory operations.

23.0 SUBCONTRACTING AND PURCHASING

Prior to subcontracting work to another laboratory, the Laboratory Director or Client Services ensures that the subcontracted laboratory is NELAP accredited, or is certified by the appropriate state, for the tests being subcontracted. Management also verifies that the laboratory has an active Quality Assurance Program (QAP) that meets SVL's and the client's DQOs. This may be accomplished by obtaining a copy of the subcontracting laboratory's QAP, or

equivalent document. The Laboratory Director or Client Services advises the client that the work is being subcontracted.

SVL ensures that purchase orders contain the required technical and quality specifications prior to release. If a catalog specifies technical and quality criteria (like the grade or purity), reference to a catalog number is deemed satisfactory.

SVL tests reagents and standards prior to analyzing samples and reporting data. New reagents will be used in Method Blank and LCS preparations; if the QC requirements are met then those reagents are deemed to be acceptable. Standards will be diluted so as to fit into the current linear range of the instrument; they will be accompanied by a Method Blank and LCS to ensure that the standard is of sufficient quality and passes the grade and purity criteria as put forth by the manufacturer (SOP SVL 1015).

24.0 TRANSFER OF ANALYTICAL REPORTS, RECORDS and SAMPLES

In the event that SVL Analytical, Inc. (SVL) goes out of business or there occurs a transfer of ownership, the following plans will apply.

All current clients and past clients going back 5 years, longer if bound by contract, will be contacted by registered mail, return receipt requested, at their current or last known address, and made aware of the permanent closure or transfer of ownership of SVL.

Clients will be requested to respond in writing by return mail, fax or email within 10 business days with the instructions as to the final disposition (in the case of closure) or as to how they wish to proceed with the new ownership concerning their reports, records and/or samples, including work that is in progress.

Options for the client may include complete transfer of all reports, records and samples to their business location, or, complete destruction of all documents and samples. SVL does not take ownership of client samples at any time or under any circumstances, and title to all reports, records and samples resides with the client. SVL will not be responsible for disposal of hazardous materials.

Methods of reports and records transfer may be by hard copy purge file, hard copy reports only, or by electronic data deliverables (EDD) for all date accessible and stored in SVL's database. No customized EDDs will be available.

Should a client decide to stay with the new ownership, any business relationship between the two parties will constitute a new relationship independent of any involvement by SVL. The maintenance of reports and records, and the completion of the work in progress (but not completed by SVL) shall be under the sole control of the new owner. SVL will be relinquished from any and all responsibilities concerning the business relationship between the parties.

25.0 GLOSSARY

Acceptance Criteria: Specified limits placed upon characteristics of an item, process, or service defined in required documents.

Accuracy: The degree of agreement of a measured value with the true or expected value of the quantity of concern.

Aliquot: A portion of a sample.

Analytical Spike: An aliquot of sample to which a known amount of analyte has been added after sample preparation. It is a measure of the effect of the matrix of a digest or extract. It is sometimes known as a post-digestion spike.

Batch: Environmental samples that are prepared and/or analyzed together with the same process and personnel, using the same reagents. For SVL's purposes not to exceed more than 20 samples.

Bias: A systematic error inherent in a method or caused by some idiosyncrasy of the measurement system. Temperature effects, extraction efficiencies, contamination, mechanical losses, and calibration errors create bias. Bias may be either positive or negative.

Blank: An artificial sample designed to monitor the introduction of contamination into the process. For aqueous samples, reagent water is used as a blank matrix.

Calibration Blank: See Section 14.0 Quality Control.

Contract Laboratory Program (CLP): EPA program defined by a Statement of Work (SOW). SVL is currently operating under ILMO5.4, all definitions relating to the program can be found in the SOW.

Method Blank: See Section 14.0 Quality Control.

Field Blank: See Section 14.0 Quality Control.

Trip Blank: See Section 14.0 Quality Control.

Blind Sample: A sample submitted for analysis whose concentration is unknown to the analyst.

Calibration: Comparison of an instrument response with a standard or a certified instrument. Commonly it is performed with a set of known standards plotted versus a response.

Completeness: The percentage of measurements that meet quality control acceptance criteria for requested determinations. Percentage completeness is defined by client DQOs.

Continuing Calibration Verification (CCV): See Section 14.0 Quality Control.

Continuing Calibration Blank (CCB): See Section 14.0 Quality Control.

Control Chart: A graphical plot of test results with respect to time or sequence of measurement, together with limits within which they are expected to lie when the system is in a state of statistical control.

Custody Log: A system for tracking samples from the time they enter the lab until a final report is generated.

Dissolved Analytes: An aqueous sample that has been passed through a 45 µm filter. The filtered portion is then run for dissolved analysis.

Double Blind Sample: A sample known by the submitter but submitted to an analyst in such a way that its identification as a check sample is unknown.

Duplicate Sample: See Section 14.0 Quality Control.

Homogeneity: The degree to which a property or substance is evenly distributed throughout a material.

Initial Calibration Verification (ICV): See Section 14.0 Quality Control.

Instrument Detection Limit (IDL): The smallest concentration detectable on a specific instrument. It is statistically determined by analysis of at least seven replicates of a blank that has not been digested.

Interference Check Sample (ICS): A sample with known concentrations of elements used to determine if the inter-element correction factors of the ICP are accurate.

Internal Standard: Pure analyte(s) added to a sample, extract, or standard solution in known amount(s) and used to measure the relative responses of other method analytes that are components of the same sample or solution. The internal standard must be an analyte that is not in the sample.

Initial Calibration Blank (ICB): See Section 14.0 Quality Control.

Instrument Performance Check (IPC) Solution: A solution of method analytes, used to evaluate the performance of the instrument system with respect to a defined set of method criteria. The CCV or LCS may fit this criteria.

Laboratory Control Sample (LCS): See Section 14.0 Quality Control.

Laboratory Fortified Blank (LFB): Another term for a laboratory control sample.

Laboratory Fortified Matrix (LFM): Another term for a matrix spike.

Laboratory Reagent Blank (LRB): Another term for a method blank.

Limit(s) of Detection (LOD): A laboratory's estimate of the minimum amount of an analyte in a given matrix that an analytical process can reliably detect in their facility.

Limit(s) of Quantitation (LOQ): The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence.

Linear Calibration Range (LCR): The concentration range over which the instrument response to analyte is linear.

Linear Dynamic Range (LDR): The concentration range over which the instrument response to analyte is linear.

Material Safety Data Sheet: Written information provided by vendors concerning a chemical's toxicity, health hazards, physical properties, fire and reactivity data including storage, spill and handling precautions.

Matrix: The substrate of a test sample.

Matrix Spike (MS): See Section 14.0 Quality Control.

Matrix Spike Duplicate (MSD: See Section 14.0 Quality Control.

Mean: The sum of all observations divided by the number of observations.

Method: A body of procedures and techniques for performing an activity (e.g., sampling, chemical analysis, quantification), systematically presented in the order they are to be performed.

Method of Standard Addition: Is commonly used to determine the concentration of an analyte that is a complex matrix. The matrix may contain other components that interfere with the analytical signal causing inaccuracy in the determined concentration. Known concentrations are added to a volume of sample to develop a curve based upon the interferences from that sample, so that a reliable concentration can be derived for the sample.

Method Detection Limit (MDL): The smallest concentration detectable on an instrument with 99% certainty by a specific method. It is statistically determined by analysis of seven replicates of a low-level standard, prepared in the same way as a sample.

Performance Test (PT) Sample: A sample, the composition of which is unknown to the laboratory and is provided to test whether the laboratory can produce analytical results within the specified acceptance criteria.

Precision: The degree of agreement of independent measurements under specified conditions.

Quality Assurance: A system of activities used to ensure defined standards of quality.

Quality Control: A system for verifying and maintaining the desired level of accuracy and precision of an analytical method.

Quality Control Sample (QCS): A solution of method analytes of known concentrations which is used to fortify an aliquot of LRB or sample matrix. The QCS is prepared from a secondary source. The ICV fits this criteria.

Relative Standard Deviation (%RSD): The Standard Deviation divided by the Mean and multiplied by 100.

Reporting Limit (RL): The smallest concentration usually reported for an analyte. It is usually at least three times the Method Detection Limit.

Reporting Limit Check Standard (RLCS): See Section 14.0 Quality Control.

Serial Dilution: See Section 14.0 Quality Control.

Standard Operating Procedure (SOP): A written procedure that defines a laboratory operation or analytical method.

Sub-sample: A portion taken from a sample.

Standard Deviation: Is the positive square root of the variance. A measure of the average spread around the mean.

Total Metals: Follow the digestive method outlined in 40 CFR 136 Appendix C Section 9.3. Results are reported as "total metals".

Total Recoverable Metals: Follow the digestive method outlined in 40 CFR 136 Appendix C Section 9.4. Results are reported as "total metals". This is SVL's default total metals method unless both total and total recoverable metals are requested.

Traceability: The ability to trace the history, application, or location of an entity (e.g., standard, reagent, sample). SVL tracks the entities from the moment it enters the premises until the time it is disposed of.

Tuning Solution: A solution which is used to correct instrument performance prior to calibration and sample analysis.

Variance: The value approached by the average of the sum of the squares of deviations of individual measurements from the mean. Mathematically, it may be expressed as:

$$\frac{\sum (X_i - m)^2}{n} \rightarrow \sigma^2 \text{ as } n \rightarrow \infty$$

Ordinarily, only its estimate s^2 can be known.

$$s^2 = \frac{\sum (x_1 - \bar{x})^2}{n - 1}$$

25.0 CERTIFICATIONS

SVL maintains certification for analysis of drinking water in the following states:

Arizona

California
Colorado
Idaho
Nevada
Washington
Wyoming

SVL maintains certification for analysis of environmental samples in the following states:

Arizona
California
Nevada
Washington

NELAC Certification Awarded – Primary Accreditation Florida

25.1 Copies of the Scopes of Accreditation can be located at www.svl.net .

WAYNE R. SORENSEN

PROFESSIONAL EXPERIENCE:

SVL Analytical, Inc. - Kellogg, ID 1991- Present
President / CEO - Administers company policies and formulates business strategies.

SVL Analytical, Inc. – Kellogg, ID 1987-1991
Laboratory Director: Responsible for all analytical and operational activities of the laboratory; supervised personne

SVL Analytical, Inc. – Kellogg, ID 1973-1987
Analytical Chemist: Analyzed soils and water for metals by flame atomic absorption and graphite furnace (7000 methods), for mercury by cold vapor atomic absorption (methods 7470 and 7471); for cyanide (method 9012), fluoride (method 340.2), phosphate (method 365.2), pH (method 150.1), turbidity (method 180.1), and conductivit (120.1); analyzed soils and house dusts for lead, arsenic, cadmium; analyzed hi-vol filters for metals by flame atomic absorption; performed baseline study analyses for permitting mine sites; conducted analysis for Remedial Investigation and Feasibility Study for Bunker Hill Superfund Site..

The Bunker Hill Company - Kellogg, ID October 1969-April 1973
Supervised a large integrated mine, mill and smelter analytical laboratory and trained personnel.

Kennecott Copper, Ray Mines Division March 1968-October 1969
Chief Chemist: Supervised an assay lab, trained assayers for new analytical methods and conducted applied research.

Kennecott Copper, Western Mining Division Research Center May 1965-March 1968
Analytical Chemist: Analytical methods development and applied metallurgical research on copper.

EDUCATION:

Utah State University - Logan, UT 1958-1962
B.S. Chemistry (minor: mathematics, physics)

Salt Lake Trade Tech - Salt Lake City, UT 1965
Basic Industrial Statistics

John R. Kern

PROFESSIONAL EXPERIENCE:

SVL Analytical, Inc. - Kellogg, ID October 2007 - present

Laboratory Director: Manage and direct the activities of the laboratory; establish ethical norms; evaluates personnel performance; conduct QA/QC reviews of incoming work and completed reports; work with the QA Manager to evaluate compliance with SOPs and methods.

P3 Scientific - Oakdale, MN September 2005 - April 2007

Laboratory Manager – Chemistry: Management and operation of a laboratory at a cGMP/GLP compliant CRO providing analytical (organic and inorganic analysis) and microbial services to the chemical industry.

Arena Pharmaceuticals, - Inc. San Diego, CA January 2003 - August 2005

Associate Director, Analytical Chemistry – Pharmaceutical Development: Direct the analytical chemistry laboratory within the pharmaceutical development unit at a start-up biotech/pharmaceutical company.

LC Resources - McMinnville, OR 1991 - 2003

Laboratory Director: Started and built up a contract research laboratory specializing in HPLC and LC/MS/MS services for the pharmaceutical and chemical industries. Oversaw the growth of the lab from 2 to 20 employees, with annual sales of over 3 million. Directly responsible for the day-to-day operation of the lab including project management, experimental design, preparation of proposals, client interface, contracts, budget, oversight of QA and QC departments, SOP and protocol preparation. This position involved extensive interaction with major pharmaceutical companies in negotiating contracts, planned studies, allocating resources, report preparation, and discussing technical issues. Experience was also gained in the direction of projects involving analysis of a wide variety of pharmaceutical products from OTC to complex proteins, and drugs in biological matrices.

Syntex USA, Inc. – Palo Alto, CA 1984 - 1991

Senior Chemist: Development of analytical methods for the analysis of active pharmaceutical ingredients (AIP) and determining release specifications. Prepared analytical sections for IND and NDA applications. Supervised laboratory staff and project team membership.

EDUCATION:

Montana State University - 1982

M.S. Chemistry

Eastern Michigan University - 1978

B.S. Biochemistry

Professional Memberships:

American Chemical Society since 1980
American Association of Pharmaceutical Scientist since 1998

Professional Honors:

Syntex Research Fellow, University of Illinois, 1984
Research on chiral separations under the direction of Dr. William Pirkle

Publications:

See attached

KIRBY L. GRAY

PROFESSIONAL EXPERIENCE:

SVL Analytical, Inc. - Kellogg, ID Dec. 2004-present
Technical Director - Conducts QA/QC reviews of commercial and EPA (ILMO5.4) incoming work and completed reports: supervises laboratory activities related thereto: primary contact with EPA (SMO); verifies SDGs, and responsible for MARRS (electronic data deliverable system) in coordination with DCO prior to reporting.

SVL Analytical, Inc. - Kellogg, ID March 1987-2004
Inorganic Instrumental Chemistry Department Supervisor -- Responsible for sample analysis by ICP, GFAA, FLAA, IC and CVAA.

Radersburg Mining Co. - Toston, MT September 1986-March 1987
Chemist: -- Responsible for fire assay, FLAA, and sample preparation.

IDHW, State of Idaho - Kellogg, ID August1986
Environmental Technician: --Operated X-ray fluorescence meter and collected soil samples.

Sunshine Mining Co. - Kellogg, ID May 1984-May 1986
Chemist -- Responsible for fire assay, FLAA, and classical chemistry.

The Bunker Hill Co. - Kellogg, ID May 1972-May 1982
Material Recovery Supervisor -- Responsible for operation and maintenance of water treatment plant, sulfuric acid plant, baghouse, cadmium refinery, and electric reverbatory furnace at a lead smelter.

EDUCATION:

University of Idaho - Moscow, ID Sept 1968-May 1972
B.S. Geological Engineering

North Idaho College-Coeur d'Alene, ID Sept 1966-June 1968
Engineering major

MICHAEL S. DESMARAIS

PROFESSIONAL EXPERIENCE:

SVL Analytical, Inc. - Kellogg, ID Oct. 2006 - Present
Quality Assurance Manager -- Coordinates and develops quality assurance and training programs for the laboratory, maintains laboratory accreditations, writes standard operating procedures, reviews data, conducts audits, performs root cause analysis.

SVL Analytical, Inc. - Kellogg, ID June 2004 – Oct. 2006
Chemist Inorganic Instrument Department – Responsible for analysis of samples for trace metals by EPA methods 200.7 and 6010B. Interprets and reports data.

SVL Analytical, Inc. - Kellogg, ID April 2004 – June 2004
Chemist Organic Chemistry Department – Responsible for analysis of samples for pesticides and PCBs by EPA methods 608, 8081A, and 8082. Interprets and reports data.

U.S. Army Engineer District-Alaska – Umiat, AK May 2003 - Sept. 2003
Alaska Dept. Environmental Conservation approved field chemist. Established field laboratory, developed and implemented QA/QC under USACE and ADEC requirements. Surveyed, sampled and tested soils and waters under a Total Environmental Restoration Contract (TERC).

North Creek Analytical Oct. 1997 - Dec. 2002
Senior Metals Chemist and Health/Safety Officer - Developed, revised and implemented safety and HAZMAT procedures. Developed and documented standard operating procedures. Maintained analytical instrumentation and analyzed samples for trace metals (ICP, AA and GFAA) and BTEX/GRO.

EDUCATION:

Eastern Washington University – Cheney, WA 1996-1997
Graduate coursework in Hydrology and Fisheries.

Washington State University – Pullman, WA August 1993-June 1995
B.S. in Physical Science (emphasis in Chemistry, Geology, and Environmental Science).

Yakima Valley Community College 1991
A.A.

PUBLICATIONS:

Desmarais, M.S. and Hills J.W., "A Simple Thermal Pump for In-the-Field Supercritical Fluid Extraction", Analytica Letters, 28 (14), 2575-2583 (1995)

Dunham, D.C., Desmarais, M.S., Breid T., and Hills, J.W. "Carbon Dioxide Supercritical Fluid Extraction with On-line Fluorescence Detection, Analytical Letters, 28 (14), 2561-2574 (1995)

Daniel K. Gingrich II

PROFESSIONAL EXPERIENCE:

SVL Analytical, Inc. - Kellogg, ID March 2010 - Present

Classical Chemistry Department Supervisor -- Supervises the staff and operation of SVL's TDS, Nutrient TKN, cyanide, NOX/NH4, Leco, and extraction labs. Ensures that EPA and Standard Method methods are correctly used, including EPA SOW ILMO5.4. Approves lab data prior to entry into Element (LIMS) and submission to DCO for reporting.

SVL Analytical, Inc. - Kellogg, ID July 2008 – February 2010

Classical Chemistry Analyst – Performs analysis and interpretation of the following methods: SM 4500 PE, SM 4500 S^{-2} F, SM 5540 C, SM 5310 B, EPA 350.1, EPA 353.2 , EPA 410.4 and total cyanide by EPA SOW ILMO5.4. Interprets data and up loads to Element (LIMS).

University of Idaho - Moscow, ID Aug. 2006 – May 2008

Research — Worked performing DNA analysis. Purified proteins in order to raise antibodies. Conducted presentations in department meetings.

Coeur d'Alene Cellars – Coeur d'Alene, ID Oct. 2005 – June 2006

Tested wine for pH , total and titratable acidity, sulfur dioxide and ethanol concentration.

EDUCATION:

University Of Idaho – Moscow, ID 2008

B.S. Microbiology

North Idaho College – Coeur d'Alene, ID 2006

A.A. Biology

DANNY J. SEVY

PROFESSIONAL EXPERIENCE:

SVL Analytical, Inc. - Kellogg, ID Dec 2004-present
Instrument Department Supervisor – Supervises staff and operation of SVL's ICP-AES, ICP-MS, CVAA, GFAA FLAA, and IC labs and their respective sample preparation labs. Ensures that EPA and Standard Method methods are correctly used, including EPA SOW ILMO5.4. Approves lab data in Element (LIMS) prior to submission to DCO for reporting.

SVL Analytical, Inc. - Kellogg, ID 1996-2004
Inorganic Instrument Operator -- Performs metals analysis by ICP and IC.

SVL Analytical, Inc. - Kellogg, ID 1994-1996
Classical Chemistry Analyst -- Performed classical Wet Chemistry analyses on water and soil sample, including the preparation and analysis of cyanide and nitrate/nitrate (as N) tests for soil and water samples.

SVL Analytical, Inc. - Kellogg, ID 1988-1994
Instrument Operator -- Analyzed samples using Cold Vapor Atomic Absorption and Ion Chromatography

SVL Analytical, Inc. - Kellogg, ID 1987-1988
Laboratory Technician -- Performed inorganic sample preparation and operated CVAA and GFAA instruments.

EDUCATION:

Perkin Elmer April 2008
Inorganic Workshop Series

Perkin Elmer July 2004
ICP-MS with Elan Software & Elan DRC Accessory Training Course

Perkin Elmer November 2001
Optima Instrument Series with ICP WinLab Software

OI Corporation January 2001
Operation of FS-3000 Auto-analyzer

North Idaho College - Coeur d' Alene, ID 1989-1990
Chemistry and Mathematics courses

CRYSTAL SEVY

PROFESSIONAL EXPERIENCE:

SVL Analytical, Inc. - Kellogg, ID 2006-Present

Sample Receiving Department Supervisor— Supervises SVL's sample receiving staff and is Sample Custodian for samples received under EPA SOW ILMO5.4. Responsible for setting up Work Orders within Element (LIMS), case narratives and point of contact with clients and their representatives. Works closely with SVL's Client Services and Technical Director to ensure that projects are setup and priced correctly.

SVL Analytical, Inc. - Kellogg, ID 1996-2006

Sample Receiver—Verifies sample temperature, integrity and security on receipt; creates laboratory jobs; ensures proper sample storage prior to analysis supervises sample disposal; ships sample containers to clients.

MELBA BENCICH

PROFESSIONAL EXPERIENCE:

SVL Analytical, Inc. - Kellogg, ID, February 1988 - Present
Document Control Manager – Supervises data reporting using Element (LIMS) for commercial clients and SDG reporting for EPA's CLP SOW ILMO5.4.

Shoshone Insurance – Kellogg. ID, 1984 – 1988
Duties included accounting, customer service relations and updating manuals

Travel People – Coeur d' Alene, ID, 1982 – 1984
Travel Consultant

Farmer's Insurance – Kellogg, ID 1982-1984
Duties included accounting, customer service relations and updating manuals

The Bunker Hill Company – Kellogg, ID, 1974 – 1981
Data Control Analyst

EDUCATION:

North Idaho College – Coeur d' Alene, ID, 1967 – 1968

General studies

International Correspondence School, 1980

Mathematics

APPENDIX C

SVL ANALYTICAL, INC. ANALYTICAL REPORTS

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
BMO-2008-9M	W0D0220-01	Ground Water	06-Apr-10 10:07	CS	13-Apr-2010
BMO-2008-10GU	W0D0220-02	Ground Water	07-Apr-10 10:55	CS	13-Apr-2010
BF-01	W0D0220-03	Ground Water	07-Apr-10 13:12	CS	13-Apr-2010
TM-2a	W0D0220-04	Ground Water	07-Apr-10 14:50	CS	13-Apr-2010
BMO-2008-10GL	W0D0220-05	Ground Water	08-Apr-10 12:45	CS	13-Apr-2010
BMO-2008-3B	W0D0220-06	Ground Water	08-Apr-10 14:00	CS	13-Apr-2010
GL-3	W0D0220-07	Ground Water	09-Apr-10 09:35	CS	13-Apr-2010
BMO-2008-11G	W0D0220-08	Ground Water	09-Apr-10 11:15	CS	13-Apr-2010
TM-19a	W0D0220-09	Ground Water	09-Apr-10 13:25	CS	13-Apr-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

05/14/10mab: Report reissued. Client requested report to state Dissolved SO4.

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **BMO-2008-9M**
SVL Sample ID: **W0D0220-01 (Ground Water)**

Sampled: 06-Apr-10 10:07
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	60.1	mg/L	1.50	0.38	5	W016194	EML	04/15/10 14:22	D2

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **BMO-2008-10GU**
SVL Sample ID: **W0D0220-02 (Ground Water)**

Sampled: 07-Apr-10 10:55
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	1510	mg/L	30.0	7.50	100	W016194	EML	04/15/10 14:33	D2

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **BF-01**
SVL Sample ID: **W0D0220-03 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 07-Apr-10 13:12
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	1450	mg/L	15.0	3.75	50	W016194	EML	04/15/10 14:44	D2

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **TM-2a**
SVL Sample ID: **W0D0220-04 (Ground Water)**

Sampled: 07-Apr-10 14:50
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	25.6	mg/L	0.30	0.08		W016194	EML	04/16/10 11:38	

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **BMO-2008-10GL**
SVL Sample ID: **W0D0220-05 (Ground Water)**

Sampled: 08-Apr-10 12:45
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	1260	mg/L	15.0	3.75	50	W016194	EML	04/15/10 15:06	D2

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **BMO-2008-3B**
SVL Sample ID: **W0D0220-06 (Ground Water)**

Sampled: 08-Apr-10 14:00
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	162	mg/L	7.50	1.88	25	W016194	EML	04/15/10 15:17	D2

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **GL-3**
SVL Sample ID: **W0D0220-07 (Ground Water)**

Sampled: 09-Apr-10 09:35
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	48.1	mg/L	1.50	0.38	5	W016194	EML	04/16/10 11:07	D2

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **BMO-2008-11G**
SVL Sample ID: **W0D0220-08 (Ground Water)**

Sampled: 09-Apr-10 11:15
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	13.0	mg/L	0.30	0.08		W016194	EML	04/16/10 13:10	

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Client Sample ID: **TM-19a**
SVL Sample ID: **W0D0220-09 (Ground Water)**

Sampled: 09-Apr-10 13:25
Received: 13-Apr-10
Sampled By: CS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	66.5	mg/L	1.50	0.38	5	W016194	EML	04/16/10 13:20	D2

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0220**
Reported: 14-May-10 16:46

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography								
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W016194	15-Apr-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	9.97	10.0	99.7	90 - 110	W016194	15-Apr-10	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	25.6	25.6	0.0	20	W016194	16-Apr-10	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	mg/L	35.9	25.6	10.0	104	80 - 120	W016194	16-Apr-10	

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
BF-4	W0D0394-01	Ground Water	13-Apr-10 12:00	CLS	20-Apr-2010
BF-3	W0D0394-02	Ground Water	13-Apr-10 13:00	CLS	20-Apr-2010
BF-4A	W0D0394-03	Ground Water	13-Apr-10 17:00	CLS	20-Apr-2010
BMO-2008-13M	W0D0394-04	Ground Water	13-Apr-10 18:33	CLS	20-Apr-2010
TM-3	W0D0394-05	Ground Water	14-Apr-10 06:50	CLS	20-Apr-2010
TM-16	W0D0394-06	Ground Water	14-Apr-10 07:55	CLS	20-Apr-2010
TM-6	W0D0394-07	Ground Water	14-Apr-10 08:50	CLS	20-Apr-2010
BMO-2008-13B	W0D0394-08	Ground Water	14-Apr-10 13:35	CLS	20-Apr-2010
BMO-2008-6M	W0D0394-09	Ground Water	15-Apr-10 07:20	CLS	20-Apr-2010
BMO-2008-6B	W0D0394-10	Ground Water	15-Apr-10 08:20	CLS	20-Apr-2010
BMO-2008-1G	W0D0394-11	Ground Water	15-Apr-10 11:00	CLS	20-Apr-2010
BMO-2008-7M	W0D0394-12	Ground Water	15-Apr-10 13:35	CLS	20-Apr-2010
BMO-2008-5B	W0D0394-13	Ground Water	15-Apr-10 14:20	CLS	20-Apr-2010
BMO-2008-8M	W0D0394-14	Ground Water	16-Apr-10 09:10	CLS	20-Apr-2010
BMO-2008-8B	W0D0394-15	Ground Water	16-Apr-10 10:05	CLS	20-Apr-2010
BMO-2008-4B	W0D0394-16	Ground Water	16-Apr-10 11:50	CLS	20-Apr-2010
BMO-2008-5M	W0D0394-17	Ground Water	16-Apr-10 13:40	CLS	20-Apr-2010
BF-10	W0D0394-18	Ground Water	16-Apr-10 14:30	CLS	20-Apr-2010
TM-42	W0D0394-19	Ground Water	19-Apr-10 08:30	CLS	20-Apr-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

05/14/10mab: Report reissued. Client requested the report to state Dissolved SO4

06/07/10mab: Report reissued. Client requested reanalysis for Dissolved Sulfate for sample -06; reanalysis reported.
Conductivity was analyzed for sample -06 per client request.

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BF-4**
SVL Sample ID: **W0D0394-01 (Ground Water)**

Sampled: 13-Apr-10 12:00
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W017215	EML	04/22/10 17:48	

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

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BF-3**
SVL Sample ID: **W0D0394-02 (Ground Water)**

Sampled: 13-Apr-10 13:00
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W017215	EML	04/22/10 18:16	

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

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BF-4A**
SVL Sample ID: **W0D0394-03 (Ground Water)**

Sampled: 13-Apr-10 17:00
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W017215	EML	04/22/10 18:25	

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-13M**
SVL Sample ID: **W0D0394-04 (Ground Water)**

Sampled: 13-Apr-10 18:33
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	398	mg/L	3.00	0.75	10	W017215	EML	04/22/10 18:35	D2

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **TM-3**
SVL Sample ID: **W0D0394-05 (Ground Water)**

Sampled: 14-Apr-10 06:50
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	103	mg/L	1.50	0.38	5	W017215	EML	04/22/10 18:44	D2

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

John Kern
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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **TM-16**
SVL Sample ID: **W0D0394-06 (Ground Water)**

Sampled: 14-Apr-10 07:55
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Classical Chemistry Parameters										
EPA 120.1	**Specific conductance**	1310	µmhos/cm	1.00			W023172	AGF	06/03/10 15:55	H3
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	484	mg/L	7.50	1.88	25	W017215	EML	06/03/10 13:35	D2

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **TM-6**
SVL Sample ID: **W0D0394-07 (Ground Water)**

Sampled: 14-Apr-10 08:50
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	29.0	mg/L	1.50	0.38	5	W017215	EML	04/22/10 19:03	D2

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-13B**
SVL Sample ID: **W0D0394-08 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 14-Apr-10 13:35
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	974	mg/L	15.0	3.75	50	W017215	EML	04/23/10 16:21	D2

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-6M**
SVL Sample ID: **W0D0394-09 (Ground Water)**

Sampled: 15-Apr-10 07:20
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	208	mg/L	3.00	0.75	10	W017215	EML	04/23/10 16:32	D2

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

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-6B**
SVL Sample ID: **W0D0394-10 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 15-Apr-10 08:20
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	37.0	mg/L	0.30	0.08		W017215	EML	04/23/10 16:44	

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-1G**
SVL Sample ID: **W0D0394-11 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 15-Apr-10 11:00
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	95.2	mg/L	1.50	0.38	5	W017215	EML	04/23/10 16:55	D2

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-7M**
SVL Sample ID: **W0D0394-12 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 15-Apr-10 13:35
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	26.0	mg/L	0.30	0.08		W017215	EML	04/23/10 17:07	

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-5B**
SVL Sample ID: **W0D0394-13 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 15-Apr-10 14:20
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	194	mg/L	1.50	0.38	5	W017215	EML	04/23/10 17:19	D2

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-8M**
SVL Sample ID: **W0D0394-14 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 16-Apr-10 09:10
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	97.0	mg/L	1.50	0.38	5	W017215	EML	04/23/10 17:30	D2

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-8B**
SVL Sample ID: **W0D0394-15 (Ground Water)**

Sampled: 16-Apr-10 10:05
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	1470	mg/L	15.0	3.75	50	W017215	EML	04/23/10 17:42	D2

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

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-4B**
SVL Sample ID: **W0D0394-16 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 16-Apr-10 11:50
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	9.73	mg/L	0.30	0.08		W017215	EML	04/23/10 17:54	

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

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BMO-2008-5M**
SVL Sample ID: **W0D0394-17 (Ground Water)**

Sampled: 16-Apr-10 13:40
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	125	mg/L	1.50	0.38	5	W017215	EML	04/24/10 19:31	D2

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

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **BF-10**
SVL Sample ID: **W0D0394-18 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 16-Apr-10 14:30
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	124	mg/L	1.50	0.38	5	W017215	EML	04/24/10 19:43	D2

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

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Client Sample ID: **TM-42**
SVL Sample ID: **W0D0394-19 (Ground Water)**

Sampled: 19-Apr-10 08:30
Received: 20-Apr-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	444	mg/L	3.00	0.75	10	W017215	EML	04/23/10 19:03	D2

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

John Kern
Laboratory Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0394**
Reported: 07-Jun-10 12:24

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Classical Chemistry Parameters								
EPA 120.1	Specific conductance	µmhos/cm	<1.00		1.00	W023172	03-Jun-10	
Dissolved Anions by Ion Chromatography								
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W017215	22-Apr-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Classical Chemistry Parameters									
EPA 120.1	Specific conductance	µmhos/cm	389	413	94.2	85 - 115	W023172	03-Jun-10	
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	9.46	10.0	94.6	90 - 110	W017215	22-Apr-10	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters									
EPA 120.1	Specific conductance	µmhos/cm	2500	2520	0.7	20	W023172	03-Jun-10	
EPA 120.1	Specific conductance	µmhos/cm	632	635	0.5	20	W023172	03-Jun-10	
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	<0.30	<0.30	UDL	20	W017215	22-Apr-10	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	mg/L	12.9	<0.30	10.0	129	80 - 120	W017215	22-Apr-10	M1
EPA 300.0	Sulfate as SO4	mg/L	19.3	9.73	10.0	95.6	80 - 120	W017215	23-Apr-10	

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Freeport McMoran - Copper Queen Branch	**Project Name: Copper Queen Branch Sulfate Mitigation Order**
36 West Highway 92	Work Order: **W0D0394**
Bisbee, AZ 85603	Reported: 07-Jun-10 12:24

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
H3	Sample was received and analyzed past holding time.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
BIMA	W0D0455-01	Ground Water	19-Apr-10 11:20	BD	22-Apr-2010
NOTEMAN	W0D0455-02	Ground Water	19-Apr-10 12:20	BD	22-Apr-2010
DODSON	W0D0455-03	Ground Water	19-Apr-10 14:45	BD	22-Apr-2010
DUP041910	W0D0455-04	Ground Water	19-Apr-10 15:00	BD	22-Apr-2010
OSBORN	W0D0455-05	Ground Water	19-Apr-10 17:00	BD	22-Apr-2010
COB MW-1	W0D0455-06	Ground Water	20-Apr-10 11:15	BD	22-Apr-2010
BANKS 986	W0D0455-07	Ground Water	20-Apr-10 14:25	BD	22-Apr-2010
KEEFER	W0D0455-08	Ground Water	20-Apr-10 16:15	BD	22-Apr-2010
PANAGAKOS	W0D0455-09	Ground Water	20-Apr-10 17:20	BD	22-Apr-2010
NESS	W0D0455-10	Ground Water	20-Apr-10 10:15	BD	22-Apr-2010
SWAN	W0D0455-11	Ground Water	21-Apr-10 11:20	BD	22-Apr-2010
ANDERSON	W0D0455-12	Ground Water	21-Apr-10 13:17	BD	22-Apr-2010
RAY	W0D0455-13	Ground Water	20-Apr-10 14:44	TT	22-Apr-2010
FULTZ	W0D0455-14	Ground Water	20-Apr-10 17:21	TT	22-Apr-2010
EAST	W0D0455-15	Ground Water	21-Apr-10 08:53	TT	22-Apr-2010
SCHWARTZ	W0D0455-16	Ground Water	21-Apr-10 11:44	TT	22-Apr-2010
NWC-04	W0D0455-17	Ground Water	21-Apr-10 12:20	TT	22-Apr-2010
NWC-03	W0D0455-18	Ground Water	21-Apr-10 12:58	TT	22-Apr-2010
NWC-06	W0D0455-19	Ground Water	21-Apr-10 13:25	TT	22-Apr-2010
NWC-02	W0D0455-20	Ground Water	21-Apr-10 13:45	TT	22-Apr-2010
DUP042110	W0D0455-21	Ground Water	21-Apr-10 00:00	TT	22-Apr-2010
EQB042110	W0D0455-22	Ground Water	21-Apr-10 00:00	TT	22-Apr-2010
FB042110	W0D0455-23	Ground Water	21-Apr-10 00:00	TT	22-Apr-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

05/13/10mab: Report reissued. Client reqested the report to state Dissolved SO4.

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **BIMA**
SVL Sample ID: **W0D0455-01 (Ground Water)**

Sampled: 19-Apr-10 11:20
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	256	mg/L	3.00	0.75	10	W018045	FEH	04/26/10 22:51	D2

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

Kirby Gray
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **NOTEMAN**
SVL Sample ID: **W0D0455-02 (Ground Water)**

Sampled: 19-Apr-10 12:20
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	307	mg/L	3.00	0.75	10	W018045	FEH	04/26/10 23:02	D2

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **DODSON**
SVL Sample ID: **W0D0455-03 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 19-Apr-10 14:45
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	48.8	mg/L	1.50	0.38	5	W018045	FEH	04/26/10 23:37	D2

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

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Freeport McMoran - Copper Queen Branch
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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **DUP041910**
SVL Sample ID: **W0D0455-04 (Ground Water)**

Sampled: 19-Apr-10 15:00
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	48.6	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 00:11	D1

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

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36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **OSBORN**
SVL Sample ID: **W0D0455-05 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 19-Apr-10 17:00
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	19.3	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 00:23	D1

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **COB MW-1**
SVL Sample ID: **W0D0455-06 (Ground Water)**

Sampled: 20-Apr-10 11:15
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	783	mg/L	7.50	1.88	25	W018045	FEH	04/27/10 10:31	D2

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **BANKS 986**
SVL Sample ID: **W0D0455-07 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 20-Apr-10 14:25
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	53.9	mg/L	3.00	0.75	10	W018045	FEH	04/27/10 00:46	D2

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

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Freeport McMoran - Copper Queen Branch
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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **KEEFER**
SVL Sample ID: **W0D0455-08 (Ground Water)**

Sampled: 20-Apr-10 16:15
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	8.77	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 00:57	D1

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **PANAGAKOS**
SVL Sample ID: **W0D0455-09 (Ground Water)**

Sampled: 20-Apr-10 17:20
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	608	mg/L	7.50	1.88	25	W018045	FEH	04/27/10 13:12	D2

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **NESS**
SVL Sample ID: **W0D0455-10 (Ground Water)**

Sampled: 20-Apr-10 10:15
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	42.1	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 01:21	D1

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

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Freeport McMoran - Copper Queen Branch
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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **SWAN**
SVL Sample ID: **W0D0455-11 (Ground Water)**

Sampled: 21-Apr-10 11:20
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	20.9	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 10:42	D1

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **ANDERSON**
SVL Sample ID: **W0D0455-12 (Ground Water)**

Sampled: 21-Apr-10 13:17
Received: 22-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	627	mg/L	7.50	1.88	25	W018045	FEH	04/27/10 10:54	D2

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **RAY**
SVL Sample ID: **W0D0455-13 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 20-Apr-10 14:44
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	134	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 11:05	D2

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **FULTZ**
SVL Sample ID: **W0D0455-14 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 20-Apr-10 17:21
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	68.3	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 11:17	D2

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

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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **EAST**
SVL Sample ID: **W0D0455-15 (Ground Water)**

Sampled: 21-Apr-10 08:53
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	14.4	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 11:28	D1

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

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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **SCHWARTZ**
SVL Sample ID: **W0D0455-16 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 21-Apr-10 11:44
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	129	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 11:40	D2

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

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Freeport McMoran - Copper Queen Branch
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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **NWC-04**
SVL Sample ID: **W0D0455-17 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 21-Apr-10 12:20
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	218	mg/L	3.00	0.75	10	W018045	FEH	04/27/10 11:51	D2

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

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Freeport McMoran - Copper Queen Branch
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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **NWC-03**
SVL Sample ID: **W0D0455-18 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 21-Apr-10 12:58
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	433	mg/L	7.50	1.88	25	W018045	FEH	04/27/10 12:03	D2

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **NWC-06**
SVL Sample ID: **W0D0455-19 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 21-Apr-10 13:25
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	8.49	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 13:24	D1

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

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Freeport McMoran - Copper Queen Branch
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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **NWC-02**
SVL Sample ID: **W0D0455-20 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 21-Apr-10 13:45
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	7.26	mg/L	1.50	0.38	5	W018045	FEH	04/27/10 12:49	D1

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

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Freeport McMoran - Copper Queen Branch
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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **DUP042110**
SVL Sample ID: **W0D0455-21 (Ground Water)**

Sampled: 21-Apr-10 00:00
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	13.9	mg/L	0.30	0.08		W018044	EML	04/27/10 12:06	

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

Kirby Gray

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Freeport McMoran - Copper Queen Branch
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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **EQB042110**
SVL Sample ID: **W0D0455-22 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 21-Apr-10 00:00
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W018044	EML	04/27/10 12:38	

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Client Sample ID: **FB042110**
SVL Sample ID: **W0D0455-23 (Ground Water)**

Sampled: 21-Apr-10 00:00
Received: 22-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W018044	EML	04/27/10 12:49	

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0455**
Reported: 14-May-10 16:26

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography								
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W018044	26-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W018045	26-Apr-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	9.98	10.0	99.8	90 - 110	W018044	26-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	10.2	10.0	102	90 - 110	W018045	26-Apr-10	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	<0.30	<0.30	UDL	20	W018044	28-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	49.1	48.8	0.7	20	W018045	26-Apr-10	D2

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	mg/L	59.5	48.8	10.0	107	80 - 120	W018045	27-Apr-10	D2
EPA 300.0	Sulfate as SO4	mg/L	15.5	7.26	10.0	82.5	80 - 120	W018045	27-Apr-10	D1
EPA 300.0	Sulfate as SO4	mg/L	10.5	<0.30	10.0	105	80 - 120	W018044	28-Apr-10	

Notes and Definitions

D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of target analyte.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
RAMIREZ	W0D0531-01	Water	21-Apr-10 16:18	TT	27-Apr-2010
ROGERS E	W0D0531-02	Water	21-Apr-10 17:38	TT	27-Apr-2010
MOORE	W0D0531-03	Water	22-Apr-10 08:24	TT	27-Apr-2010
ZANDER	W0D0531-04	Water	22-Apr-10 09:44	TT	27-Apr-2010
COOPER	W0D0531-05	Water	22-Apr-10 13:12	TT	27-Apr-2010
BURKE	W0D0531-06	Water	22-Apr-10 13:49	TT	27-Apr-2010
COOPER C	W0D0531-07	Water	22-Apr-10 14:54	TT	27-Apr-2010
PALMER	W0D0531-08	Water	22-Apr-10 15:29	TT	27-Apr-2010
PARRA	W0D0531-09	Water	22-Apr-10 16:43	TT	27-Apr-2010
AWC-05	W0D0531-10	Water	23-Apr-10 09:05	TT	27-Apr-2010
AWC-03	W0D0531-11	Water	23-Apr-10 09:49	TT	27-Apr-2010
AWC-02	W0D0531-12	Water	23-Apr-10 10:12	TT	27-Apr-2010
AWC-04	W0D0531-13	Water	23-Apr-10 10:30	TT	27-Apr-2010
FRANCO	W0D0531-14	Water	23-Apr-10 11:39	TT	27-Apr-2010
COLLINS	W0D0531-15	Water	23-Apr-10 12:28	TT	27-Apr-2010
HOWARD	W0D0531-16	Water	21-Apr-10 16:45	TT	27-Apr-2010
MCCONNELL 265	W0D0531-17	Water	22-Apr-10 08:38	TT	27-Apr-2010
GARNER 635	W0D0531-18	Water	22-Apr-10 11:15	TT	27-Apr-2010
POOL	W0D0531-19	Water	22-Apr-10 14:05	TT	27-Apr-2010
WEISKOPF	W0D0531-20	Water	22-Apr-10 15:10	TT	27-Apr-2010
ROGERS 596	W0D0531-21	Water	22-Apr-10 17:25	TT	27-Apr-2010
TVI 236	W0D0531-22	Water	23-Apr-10 09:52	TT	27-Apr-2010
TVI 875	W0D0531-23	Water	23-Apr-10 09:15	TT	27-Apr-2010
CHAMBERS	W0D0531-24	Water	23-Apr-10 12:40	TT	27-Apr-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

05/06/10mab: Report reissued. The original anlaysis for sample -20 was incorrect due to a 50X dilution that was not applied. The sample was reanalyzed and the reanalysis results are shown.

05/14/10mab: Report reissued. Client requested report to state Dissolved SO4.

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **RAMIREZ**
SVL Sample ID: **W0D0531-01 (Water)**

Sampled: 21-Apr-10 16:18
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	9.04	mg/L	0.30	0.08		W018221	EML	04/29/10 20:46	

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

Kirby Gray

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Technical Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **ROGERS E**
SVL Sample ID: **W0D0531-02 (Water)**

Sample Report Page 1 of 1

Sampled: 21-Apr-10 17:38
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	6.04	mg/L	0.30	0.08		W018221	EML	04/29/10 20:57	

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **MOORE**
SVL Sample ID: **W0D0531-03 (Water)**

Sampled: 22-Apr-10 08:24
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	7.40	mg/L	0.30	0.08		W018221	EML	04/29/10 21:08	

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Freeport McMoran - Copper Queen Branch
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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **ZANDER**
SVL Sample ID: **W0D0531-04 (Water)**

Sampled: 22-Apr-10 09:44
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	6.70	mg/L	0.30	0.08		W018221	EML	04/29/10 21:18	

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **COOPER**
SVL Sample ID: **W0D0531-05 (Water)**

Sampled: 22-Apr-10 13:12
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	34.5	mg/L	0.30	0.08		W018221	EML	04/29/10 21:29	

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Kirby Gray

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **BURKE**
SVL Sample ID: **W0D0531-06 (Water)**

Sampled: 22-Apr-10 13:49
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	24.8	mg/L	0.30	0.08		W018221	EML	04/30/10 15:30	

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **COOPER C**
SVL Sample ID: **W0D0531-07 (Water)**

Sampled: 22-Apr-10 14:54
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	884	mg/L	15.0	3.75	50	W018221	EML	04/30/10 15:41	D2

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **PALMER**
SVL Sample ID: **W0D0531-08 (Water)**

Sampled: 22-Apr-10 15:29
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	16.7	mg/L	0.30	0.08		W018221	EML	04/30/10 15:51	

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **PARRA**
SVL Sample ID: **W0D0531-09 (Water)**

Sample Report Page 1 of 1

Sampled: 22-Apr-10 16:43
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	417	mg/L	7.50	1.88	25	W018221	EML	05/03/10 07:29	D2

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **AWC-05**
SVL Sample ID: **W0D0531-10 (Water)**

Sampled: 23-Apr-10 09:05
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	17.6	mg/L	0.30	0.08		W018221	EML	04/30/10 16:13	

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **AWC-03**
SVL Sample ID: **W0D0531-11 (Water)**

Sample Report Page 1 of 1

Sampled: 23-Apr-10 09:49
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	44.4	mg/L	0.30	0.08		W018221	EML	04/30/10 16:24	

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **AWC-02**
SVL Sample ID: **W0D0531-12 (Water)**

Sample Report Page 1 of 1

Sampled: 23-Apr-10 10:12
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	18.3	mg/L	0.30	0.08		W018221	EML	04/30/10 16:45	

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **AWC-04**
SVL Sample ID: **W0D0531-13 (Water)**

Sample Report Page 1 of 1

Sampled: 23-Apr-10 10:30
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	27.4	mg/L	0.30	0.08		W018221	EML	04/30/10 16:56	

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **FRANCO**
SVL Sample ID: **W0D0531-14 (Water)**

Sample Report Page 1 of 1

Sampled: 23-Apr-10 11:39
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	699	mg/L	15.0	3.75	50	W018221	EML	04/30/10 17:28	D2

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **COLLINS**
SVL Sample ID: **W0D0531-15 (Water)**

Sample Report Page 1 of 1

Sampled: 23-Apr-10 12:28
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	561	mg/L	7.50	1.88	25	W018221	EML	04/30/10 17:39	D2

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

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Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **HOWARD**
SVL Sample ID: **W0D0531-16 (Water)**

Sampled: 21-Apr-10 16:45
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	710	mg/L	15.0	3.75	50	W018221	EML	04/30/10 17:49	D2

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

Kirby Gray
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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **MCCONNELL 265**
SVL Sample ID: **W0D0531-17 (Water)**

Sampled: 22-Apr-10 08:38
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	811	mg/L	15.0	3.75	50	W018221	EML	04/30/10 18:00	D2

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **GARNER 635**
SVL Sample ID: **W0D0531-18 (Water)**

Sampled: 22-Apr-10 11:15
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	36.9	mg/L	0.30	0.08		W018221	EML	04/30/10 18:11	

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **POOL**
SVL Sample ID: **W0D0531-19 (Water)**

Sampled: 22-Apr-10 14:05
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	130	mg/L	1.50	0.38	5	W018221	EML	04/30/10 18:21	D2

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **WEISKOPF**
SVL Sample ID: **W0D0531-20 (Water)**

Sample Report Page 1 of 1

Sampled: 22-Apr-10 15:10
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	572	mg/L	7.50	1.88	25	W018221	FEH	05/05/10 16:41	D2

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **ROGERS 596**
SVL Sample ID: **W0D0531-21 (Water)**

Sampled: 22-Apr-10 17:25
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	710	mg/L	15.0	3.75	50	W018222	FEH	04/30/10 14:21	D2

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

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36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **TVI 236**
SVL Sample ID: **W0D0531-22 (Water)**

Sample Report Page 1 of 1

Sampled: 23-Apr-10 09:52
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	30.9	mg/L	1.50	0.38	5	W018222	FEH	04/30/10 14:32	D2

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

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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **TVI 875**
SVL Sample ID: **W0D0531-23 (Water)**

Sample Report Page 1 of 1

Sampled: 23-Apr-10 09:15
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	294	mg/L	7.50	1.88	25	W018222	FEH	04/30/10 14:43	D2

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

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Freeport McMoran - Copper Queen Branch
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Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Client Sample ID: **CHAMBERS**
SVL Sample ID: **W0D0531-24 (Water)**

Sampled: 23-Apr-10 12:40
Received: 27-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	8.34	mg/L	0.30	0.08		W018222	FEH	05/03/10 07:19	

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0531**
Reported: 14-May-10 16:43

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography								
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W018221	29-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W018222	30-Apr-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	10.5	10.0	105	90 - 110	W018221	29-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	10.5	10.0	105	90 - 110	W018222	30-Apr-10	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	9.00	9.04	0.5	20	W018221	30-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	<0.30	<0.30	UDL	20	W018222	30-Apr-10	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	mg/L	29.7	18.3	10.0	114	80 - 120	W018221	03-May-10	
EPA 300.0	Sulfate as SO4	mg/L	19.0	9.04	10.0	99.7	80 - 120	W018221	30-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	10.9	<0.30	10.0	107	80 - 120	W018222	30-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	10.8	<0.30	10.0	107	80 - 120	W018222	30-Apr-10	

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
COB WL	W0D0553-01	Ground Water	26-Apr-10 09:17	BD	28-Apr-2010
COB MW-2	W0D0553-02	Ground Water	26-Apr-10 10:05	BD	28-Apr-2010
COB MW-3	W0D0553-03	Ground Water	26-Apr-10 10:38	BD	28-Apr-2010
DURAZO	W0D0553-04	Ground Water	26-Apr-10 12:03	BD	28-Apr-2010
RUIZ	W0D0553-05	Ground Water	26-Apr-10 13:52	BD	28-Apr-2010
FB042610	W0D0553-06	Ground Water	26-Apr-10 16:08	BD	28-Apr-2010
EQB042610	W0D0553-07	Ground Water	26-Apr-10 16:10	BD	28-Apr-2010
DUP042610	W0D0553-08	Ground Water	26-Apr-10 00:00	BD	28-Apr-2010
PIONKE	W0D0553-09	Ground Water	26-Apr-10 15:38	TT	28-Apr-2010
WEED	W0D0553-10	Ground Water	26-Apr-10 16:20	TT	28-Apr-2010
TM-15 MILLER	W0D0553-11	Ground Water	27-Apr-10 09:38	BD	28-Apr-2010
FB042710	W0D0553-12	Ground Water	27-Apr-10 10:50	BD	28-Apr-2010
EQB042710	W0D0553-13	Ground Water	27-Apr-10 11:48	BD	28-Apr-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

Case Narrative

05/14/10mab: Report reissued. Client requested the report to state Dissolved SO4.

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **COB WL**
SVL Sample ID: **W0D0553-01 (Ground Water)**

Sampled: 26-Apr-10 09:17
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	97.7	mg/L	3.00	0.75	10	W018222	FEH	04/30/10 15:27	D2

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

Kirby Gray
Technical Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **COB MW-2**
SVL Sample ID: **W0D0553-02 (Ground Water)**

Sampled: 26-Apr-10 10:05
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	34.8	mg/L	0.30	0.08		W018222	FEH	05/03/10 07:30	

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

Kirby Gray
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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **COB MW-3**
SVL Sample ID: **W0D0553-03 (Ground Water)**

Sampled: 26-Apr-10 10:38
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	77.6	mg/L	1.50	0.38	5	W018222	FEH	05/03/10 17:03	D2

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

Kirby Gray
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36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **DURAZO**
SVL Sample ID: **W0D0553-04 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 26-Apr-10 12:03
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	388	mg/L	7.50	1.88	25	W018222	FEH	04/30/10 16:01	D2

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

Kirby Gray
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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **RUIZ**
SVL Sample ID: **W0D0553-05 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 26-Apr-10 13:52
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	240	mg/L	7.50	1.88	25	W018222	FEH	04/30/10 16:12	D2

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

Kirby Gray

Kirby Gray
Technical Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **FB042610**
SVL Sample ID: **W0D0553-06 (Ground Water)**

Sampled: 26-Apr-10 16:08
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W018222	FEH	04/30/10 16:23	

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

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **EQB042610**
SVL Sample ID: **W0D0553-07 (Ground Water)**

Sampled: 26-Apr-10 16:10
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W018222	FEH	04/30/10 16:56	

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

Kirby Gray
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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **DUP042610**
SVL Sample ID: **W0D0553-08 (Ground Water)**

Sampled: 26-Apr-10 00:00
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	97.9	mg/L	3.00	0.75	10	W018222	FEH	04/30/10 17:30	D2

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

Kirby Gray
Technical Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **PIONKE**
SVL Sample ID: **W0D0553-09 (Ground Water)**

Sampled: 26-Apr-10 15:38
Received: 28-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	438	mg/L	15.0	3.75	50	W018222	FEH	04/30/10 17:41	D2

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

Kirby Gray
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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **WEED**
SVL Sample ID: **W0D0553-10 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 26-Apr-10 16:20
Received: 28-Apr-10
Sampled By: TT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	13.4	mg/L	0.30	0.08		W018222	FEH	04/30/10 17:52	

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

Kirby Gray

Kirby Gray
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36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **TM-15 MILLER**
SVL Sample ID: **W0D0553-11 (Ground Water)**

Sampled: 27-Apr-10 09:38
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	14.9	mg/L	0.30	0.08		W018222	FEH	04/30/10 18:03	

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

Kirby Gray
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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **FB042710**
SVL Sample ID: **W0D0553-12 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 27-Apr-10 10:50
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W018222	FEH	04/30/10 18:14	

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

Kirby Gray
Technical Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Client Sample ID: **EQB042710**
SVL Sample ID: **W0D0553-13 (Ground Water)**

Sampled: 27-Apr-10 11:48
Received: 28-Apr-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	< 0.30	mg/L	0.30	0.08		W018222	FEH	04/30/10 18:25	

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

Kirby Gray
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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0D0553**
Reported: 14-May-10 16:53

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography								
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W018222	30-Apr-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	10.5	10.0	105	90 - 110	W018222	30-Apr-10	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	<0.30	<0.30	UDL	20	W018222	30-Apr-10	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	mg/L	10.9	<0.30	10.0	107	80 - 120	W018222	30-Apr-10	
EPA 300.0	Sulfate as SO4	mg/L	10.8	<0.30	10.0	107	80 - 120	W018222	30-Apr-10	

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0E0474**
Reported: 27-May-10 15:56

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
METZLER	W0E0474-01	Ground Water	18-May-10 10:25	BD	20-May-2010
NWC-04	W0E0474-02	Ground Water	18-May-10 11:36	BD	20-May-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0E0474**
Reported: 27-May-10 15:56

Client Sample ID: **METZLER**
SVL Sample ID: **W0E0474-01 (Ground Water)**

Sample Report Page 1 of 1

Sampled: 18-May-10 10:25
Received: 20-May-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	330	mg/L	3.00	0.75	10	W021376	EML	05/25/10 02:47	D2

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

Larry Drew
Technical Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0E0474**
Reported: 27-May-10 15:56

Client Sample ID: **NWC-04**
SVL Sample ID: **W0E0474-02 (Ground Water)**

Sampled: 18-May-10 11:36
Received: 20-May-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	210	mg/L	1.50	0.38	5	W021376	EML	05/24/10 21:07	D2

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

Larry Drew
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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0E0474**
Reported: 27-May-10 15:56

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography								
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W021376	24-May-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	10.5	10.0	105	90 - 110	W021376	24-May-10	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	69.1	69.6	0.7	20	W021376	24-May-10	D2

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	mg/L	79.5	70.5	10.0	90.4	80 - 120	W021376	25-May-10	D2
EPA 300.0	Sulfate as SO4	mg/L	86.0	69.6	10.0	R > 4S	80 - 120	W021376	27-May-10	D2,M3

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0E0616**
Reported: 03-Jun-10 13:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
TM-7	W0E0616-01	Ground Water	25-May-10 13:14	CLS	27-May-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0E0616**
Reported: 03-Jun-10 13:51

Client Sample ID: **TM-7**
SVL Sample ID: **W0E0616-01 (Ground Water)**

Sampled: 25-May-10 13:14
Received: 27-May-10
Sampled By: CLS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	42.6	mg/L	0.30	0.08		W023046	EML	06/01/10 18:53	

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

Larry Drew
Technical Director

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Freeport McMoran - Copper Queen Branch
36 West Highway 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0E0616**
Reported: 03-Jun-10 13:51

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography								
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W023046	01-Jun-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	10.3	10.0	103	90 - 110	W023046	01-Jun-10	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	1.23	1.30	5.3	20	W023046	01-Jun-10	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	mg/L	10.6	1.30	10.0	92.9	80 - 120	W023046	01-Jun-10	

Notes and Definitions

LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoRan - Bisbee
36 West Hwy 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0F0270**
Reported: 16-Jun-10 09:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
NWC-04	W0F0270-01	Ground Water	08-Jun-10 10:28	BD	10-Jun-2010

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoRan - Bisbee
36 West Hwy 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0F0270**
Reported: 16-Jun-10 09:02

Client Sample ID: **NWC-04**
SVL Sample ID: **W0F0270-01 (Ground Water)**

Sampled: 08-Jun-10 10:28
Received: 10-Jun-10
Sampled By: BD

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	**Sulfate as SO4**	212	mg/L	1.50	0.38	5	W024337	EML	06/15/10 02:09	D2

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

John Kern
Laboratory Director

One Government Gulch - PO Box 929 Kellogg ID 83837-0929 (208) 784-1258 Fax (208) 783-0891

Freeport McMoRan - Bisbee
36 West Hwy 92
Bisbee, AZ 85603

Project Name: Copper Queen Branch Sulfate Mitigation Order
Work Order: **W0F0270**
Reported: 16-Jun-10 09:02

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography								
EPA 300.0	Sulfate as SO4	mg/L	<0.30	0.08	0.30	W024337	14-Jun-10	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	9.83	10.0	98.3	90 - 110	W024337	14-Jun-10	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography									
EPA 300.0	Sulfate as SO4	mg/L	1.09	1.08	1.0	20	W024337	14-Jun-10	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Dissolved Anions by Ion Chromatography										
EPA 300.0	Sulfate as SO4	mg/L	10.6	1.08	10.0	95.5	80 - 120	W024337	14-Jun-10	

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

APPENDIX D

GROUNDWATER SAMPLING FORMS

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	Anderson	Weather:	Cloudy 70's
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	236'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	147.57
Casing Volume (gals):	136.83
3 Casing Volumes (gals):	396

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
12:25							
12:35	10	8	80	6.92	19.8	1386	
12:45	20	8	160	7.15	19.7	1399	
12:55	30	8	240	7.23	20.4	1411	
13:05	40	8	320	7.37	20.5	1438	
13:15	50	8	400	7.40	20.7	1439	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Anderson	13:17	PE	250mL	1		✓	

Additional Comments: Spigot is connected ~~to well #~~ BO to storage tank. Sample collected from storage tank.

CLEAR CREEK ASSOCIATES

Joe Cory

ARIZONA WATER COMPANY

PUMPING LEVEL

4-20-10

Division: BISBEE

☒ APRIL

Year: 2010

☐ OCTOBER

WELL # AND NAME	STATIC WATER LEVEL (FT.) (PUMP OFF)	APPROX. LENGTH OF TIME PUMP "OFF" PRIOR TO RECORDING STATIC WATER LEVEL	DYNAMIC WATER LEVEL (FT.) (PUMP ON)	PUMP DISCHARGE (GPM)	APPROX. LENGTH OF TIME PUMP "ON" PRIOR TO RECORDING DYNAMIC WATER LEVEL	DATE	STATIC PRESSURE	DYNAMIC DISCHARGE PRESSURE
#2 - Naco DWR #55-616586	119	3 Hrs.	165	98	1 Hr.	4-20-10		
#3 - Naco Power DWR #55-616585	116	2 Hrs.	176	690	2½ Hrs.	4-20-10		
#4 - Naco Power Plant DWR #55-616584	109	2 Hrs.	124	750	2½ Hrs.	4-20-10		
#5 - Naco DWR #55-590620	278	2 Hrs.	346	520	1 Hr	4-20-10		

AFH

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	AWC-02	Weather:	rainy, cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	330'
Casing Diameter (in):	
Static Water Level (ft bmp):	119' (4-20-10)
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1007	—	98	—	7.56	19.7	526	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
AWC-02	1012						

Additional Comments: * well has been running for 68 minutes prior to arrival.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	AWC-03	Weather:	Cloudy, Cold, rain
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	269'
Casing Diameter (in):	
Static Water Level (ft bmp):	116' (4-20-10)
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
		690					
0940	—	~~Hose~~	—	7.57	19.7	468	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
AWC-03	0949						

Additional Comments: * pump ran for 30 minutes prior to arrival.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	AWC-04	Weather:	rain, cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	250'
Casing Diameter (in):	
Static Water Level (ft bmp):	109' (4-20-10)
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1025	—	750	—	7.14	19.2	625	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
AWC-04	1030						

Additional Comments: * well has been pumping for 30 minutes prior to arrival.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	AWC-05	Weather:	cloudy, cold, rain
ADWR No:		Sampler:	

WELL DATA

Well Depth (ft bls):	600'
Casing Diameter (in):	
Static Water Level (ft bmp):	278' (4-20-10)
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0859	—	520	—	7.62	18.9	443	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
AWC-05	0905						

Additional Comments: * pump has been running for 75 minutes prior to arrival.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-20-10
Well ID:	Banks986	Weather:	Sunny Warm
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	435
Casing Diameter (in):	6"
Static Water Level (ft bmp):	NA
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
13:35							
13:40	5	7	35	7.44	23.5	1051	
13:50	15	7	105	7.65	22.8	1034	
14:00	25	7	175	7.67	23.1	1016	
14:10	35	7	245	7.63	22.4	1023	
14:20	45	7	315	7.71	22.8	1013	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Banks 986	14:25	PE	250mL	1		Ø	

Additional Comments: Pumped until stable.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-20-10
Well ID:	Banks 987	Weather:	SUNNY (Warm
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	219.35
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLO

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-7-10
Well ID:	BF-01	Weather:	Sunny 45°
ADWR No:		Sampler:	Christopher L. Sherman

WELL DATA

Well Depth (ft bls):	400
Casing Diameter (in):	4"
Static Water Level (ft bmp):	348.70
Casing Volume (gals):	33.3
3 Casing Volumes (gals):	100

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0815							
0818				5.89	20.3	2620	
0819	Broke Suction						
1310				5.83	20.4	1853	365.71

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BF-01	1312	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Waited 4 hrs and 50 min recommended SWL @ 365.71

Started pump monitored one min and sampled

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4/19/10
Well ID:	BIMA	Weather:	Cloudy
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	465
Casing Diameter (in):	4
Static Water Level (ft bmp):	382.25
Casing Volume (gals):	54
3 Casing Volumes (gals):	162.

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
11:00							
11:03	3	12	36	6.60	19.9	1523	
11:07	7	12	84	6.66	20.7	1528	
11:14	14	12	168	6.66	21.7	1538	
11:17	17	12	204	6.70	21.9	1533	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BIMA	11:20	PE	250mL	1		Ø	

Additional Comments: Had to try 2 sounders to get reading
1st sounder would not go past 325'

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-15-10
Well ID:	BMO-2008-16	Weather:	Sunny 63°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	310
Casing Diameter (in):	5"
Static Water Level (ft bmp):	65.05
Casing Volume (gals):	250
3 Casing Volumes (gals):	750

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0920							
0930	10	8.3	83	6.75	21.2	787	
0945	25	8.3	207	7.03	21.6	710	
1005	45	8.3	373	7.08	21.9	690	
1039	70	8.3	581	7.02	22.1	708	
1050	90	8.3	747	7.00	223	711	
1100	100	8.3	830	7.04	22.2	714	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-16	1100	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-8-10
Well ID:	BMO-2008-3B	Weather:	Sunny 73°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	260
Casing Diameter (in):	5"
Static Water Level (ft bmp):	140.07
Casing Volume (gals):	121.6
3 Casing Volumes (gals):	364.8

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1340							
1345	5	27	135	6.44	21.1	565	
1350	10	27	270	6.44	21.6	579	
1355	15	27	405	6.46	20.9	582	
1400	20	27	540	6.47	21.3	585	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-3B	1400	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-16-10
Well ID:	BMO-2008-4B	Weather:	Sunny 76°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	610
Casing Diameter (in):	5"
Static Water Level (ft bmp):	132.65
Casing Volume (gals):	486.8
3 Casing Volumes (gals):	1460.4

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1050							
1100	10	23	230	7.73	22.3	322	
1120	35	23	805	7.74	22.8	328	
1130	45	23	1035	7.72	23.2	325	
1150	65	23	1495	7.70	23.4	330	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-4B	1150	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

477.3

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-15-10
Well ID:	BMO-2008-5B	Weather:	Sunny — calm - 75°
ADWR No:		Sampler:	Christopher L Sherrard

WELL DATA

Well Depth (ft bls):	285'
Casing Diameter (in):	5"
Static Water Level (ft bmp):	145.80
Casing Volume (gals):	142
3 Casing Volumes (gals):	426

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
13.55							
1400	5	27	135	7.12	22.6	579	
1410	15	27	405	7.20	22.9	581	
1420	25	27	675	7.21	23.0	571	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-5B	1420	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

11 sec

139.2

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-16-10
Well ID:	BMO-2008-5M	Weather:	Sunny - 72°
ADWR No:		Sampler:	Christopher L Shuman

WELL DATA

Well Depth (ft bls):	450
Casing Diameter (in):	5"
Static Water Level (ft bmp):	147.34
Casing Volume (gals):	308.6
3 Casing Volumes (gals):	925.8

Casing Capacity	
Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1250							
1255	5	18	90	7.30	23.0	496	Duplicate BF-10
1310	20	18	360	7.19	22.9	510	
1330	45	18	810	7.25	22.6	510	
1340	55	18	990	7.28	22.6	509	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-5M	1340	plastic	250 ml	1	EPA 300.0	none	filtered
BF-10	1430				Duplicate		

Additional Comments: 16 Sec

302.66

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-15-10
Well ID:	BMO-2008-6B	Weather:	Sunny
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	265'
Casing Diameter (in):	5"
Static Water Level (ft bmp):	190.75
Casing Volume (gals):	66.6
3 Casing Volumes (gals):	200

Casing Capacity	
Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0735							
0740	5	5.1	25	7.34	20.3	342	Brown water
0750	15	5.1	75	7.44	19.6	368	Cleared up
0805	30	5.1	150	7.46	20.8	372	
0820	45	5.1	225	7.47	21.0	362	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-6B	0820	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-15-10
Well ID:	BMO-2008-6m	Weather:	Sunny 46°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	450
Casing Diameter (in):	5"
Static Water Level (ft bmp):	191.64
Casing Volume (gals):	263.5
3 Casing Volumes (gals):	790

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0640							
0650	10	21	210	7.29	20.1	621	
0700	20	21	420	7.32	20.0	623	
0710	30	21	630	7.34	20.2	618	
0720	40	21	840	7.34	20.2	619	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-6m	0720	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

14 sw
429.87

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-15-10
Well ID:	BMO-2008-7M	Weather:	Sunny, breezy ~ 72°
ADWR No:		Sampler:	Chastaple L Sharman

WELL DATA

Well Depth (ft bls):	620
Casing Diameter (in):	5"
Static Water Level (ft bmp):	240.13
Casing Volume (gals):	438.3
3 Casing Volumes (gals):	1315

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1225							
1230	5	21	105	7.80	22.6	391	
1250	25	21	525	7.50	22.9	411	
1310	45	21	945	7.48	23.2	409	
1335	65	21	1365	7.52	23.2	415	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-7M	1335	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-16-10
Well ID:	BMO-2008-8B	Weather:	Sunny - 71°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	480
Casing Diameter (in):	5"
Static Water Level (ft bmp):	298.46
Casing Volume (gals):	185.1
3 Casing Volumes (gals):	555.3

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0920							
0930	10	14.2	142	6.10	21.2	1664	Brown Color
0940	20	14.2	284	6.04	21.4	1675	Cleared up
0950	30	14.2	426	6.01	21.7	1681	
1000	40	14.2	568	6.06	21.4	1682	
1005	45	14.2	640				

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-8B	1005	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments: 21 sol 181.54

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-16-10
Well ID:	BMO-2008-8M	Weather:	Sunny 52°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	1210
Casing Diameter (in):	5"
Static Water Level (ft bmp):	299.42
Casing Volume (gals):	928.7
3 Casing Volumes (gals):	2,786.1

Casing Capacity	
Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0630							
0645	15	17.6	264	7.24	20.4	546	
0730	60	17.6	1056	7.24	23.7	533	
0800	90	17.6	1584	7.23	23.9	530	
0830	120	17.6	2112	7.25	24.2	536	
0900	150	17.6	2640	7.28	24.4	541	
0910	160	17.6	2816	7.29	24.5	544	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-8M	0910	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments: 1746
910.58

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-6-10
Well ID:	BMO-2008-9M	Weather:	Sunny, Breezy, 44°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	725
Casing Diameter (in):	5"
Static Water Level (ft bmp):	287.81
Casing Volume (gals):	496.9
3 Casing Volumes (gals):	1437

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0844							
0850	6	18.7	112.2	6.47	22.9	487	
0922	42	18.7	673.2	6.77	23.4	480	
0951	67	18.7	1252	6.74	23.7	482	
1005	81	18.7	1514	6.74	23.8	484	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-9M	1007	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-8-10
Well ID:	BMO-2008-106L	Weather:	Sunny breezy 53°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	810'
Casing Diameter (in):	5"
Static Water Level (ft bmp):	506.31
Casing Volume (gals):	309.7
3 Casing Volumes (gals):	929.1

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0830							
0843	13	4.6	59	6.09	24.3	1846	
0930	60	3.8	276	6.00	24.4	1788	
1000	90	3.8	390	6.02	24.3	1784	
1030	120	3.3	504	6.02	24.5	1751	
1100	150	3.3	603	6.01	24.7	1753	
1200	210	3.3	801	6.00	24.8	1699	
1230	240	2.7	900	6.01	25.5	1606	
1245	255	2.7	940	6.03	25.6	1575	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-106L	1245	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-7-10
Well ID:	BMO-2008-106U	Weather:	Sunny - 49°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	449
Casing Diameter (in):	5"
Static Water Level (ft bmp):	289.5
Casing Volume (gals):	162.6
3 Casing Volumes (gals):	487.8

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0845							
0855	10	5.5	55	5.90	19.0	3340	
0915	30	5.5	110	5.92	19.8	3330	
0945	60	5.5	330	5.91	20.0	3310	
0950	65	3.5	357				
1010	85	3.3	427				
1015	90	1.5	434	5.92	20.2	3290	
1051	126	1.5	488	5.96	20.4	3210	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-106U	1055	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-9-10
Well ID:	BMO-2008-116	Weather:	Sunny 62°
ADWR No:		Sampler:	Christopher L Shuman

WELL DATA

Well Depth (ft bls):	760
Casing Diameter (in):	5¼
Static Water Level (ft bmp):	573.56
Casing Volume (gals):	190.1
3 Casing Volumes (gals):	570.3

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1000							
1010	10	8	80	6.86	22.6	300	
1030	30	8	240	6.84	23.4	300	
1100	60	8	480	6.85	24.2	299	
1112	72	8	576	6.88	24.5	301	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-116	1115	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-14-10
Well ID:	BMO-2008-13B	Weather:	Sunny, breezy ~ 73°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	475
Casing Diameter (in):	5"
Static Water Level (ft bmp):	207.27
Casing Volume (gals):	273
3 Casing Volumes (gals):	819

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1250							
1300	10	20	200	6.32	21.8	1270	
1310	20	20	400	6.31	21.8	1337	
1320	30	20	600	6.32	20.8	1356	
1330	40	20	800	6.37	21.2	1340	
1335	45		900	6.38	21.2	1346	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-13B	1335	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-13-10
Well ID:	BMO-2008-13m	Weather:	Sunny 40°
ADWR No:		Sampler:	Christopher L Thomas

WELL DATA

Well Depth (ft bls):	1030
Casing Diameter (in):	5"
Static Water Level (ft bmp):	209.20
Casing Volume (gals):	837.2
3 Casing Volumes (gals):	2,511.6

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0630							
0700	30	5.7	171	8.31	20.1	1127	
0800	90	5.7	513	8.08	22.1	1115	
0900	150	4.6	789	8.31	23.0	1081	
1000	210	3.8	1017	7.81	23.3	1061	
1100	270	3.8	1245	7.49	23.2	1111	
1200	330	2.8	1413	7.08	23.8	1123	
1400	450	2.8	1749	8.13	23.6	1114	Replaced PH probe
1600	570	2.8	2085	8.10	23.8	1126	
1800	690	2.8	2421	8.08	23.4	1132	
1833	723	2.8	2513	8.06	23.2	1130	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BMO-2008-13m	1833	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	BURKE	Weather:	cloudy, windy, cold, rain
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	781'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity	
Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1343	—	—	—	7.49	16.4	452	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BURKE	1349						

Additional Comments: *sample taken from tank. No discharge point from well. No W/L because of history of sounder getting stuck in well.

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	Chambers	Weather:	Rainy
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	245'
Casing Diameter (in):	
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
12:20							
12:24	4	14	56	7.20	19.5	430.6	
12:28	8	14	112	7.42	20.5	429.8	
12:32	12	14	168	7.49	20.9	423.2	
12:36	16	14	224	7.47	20.9	427.5	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Chambers	12:40	PE	250mL	1		Ø	

Additional Comments: ~~No Access to~~ Wiring is running through hole in well head. There is no place to get a sounder in for a water level.

Took sample after stabilization

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-20-10
Well ID:	COB-MW-1	Weather:	Partly Cloudy 60's
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	420'
Casing Diameter (in):	8"
Static Water Level (ft bmp):	235.47
Casing Volume (gals):	482
3 Casing Volumes (gals):	1446

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
08:40							
09:10	30	10	300	7.00	20.6	1779	
09:40	60	10	600	6.85	21.1	1817	
10:10	90	10	900	6.85	21.3	1849	
10:40	120	10	1200	6.89	21.5	1844	
11:10	150	10	1500	6.92	21.8	1836	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COB MW-1	11:15	PE	250ML	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:		Date:	4-26-10
Well ID:	COB MW-2	Weather:	
ADWR No:		Sampler:	

WELL DATA

Well Depth (ft bls):	170'
Casing Diameter (in):	4"
Static Water Level (ft bmp):	125.47
Casing Volume (gals):	30
3 Casing Volumes (gals):	90

Casing Capacity	
Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08
Casing Volume = gallons/foot * water column (feet)	

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
09:48							
09:53	5	7	35	6.71	21.9	477.8	
09:56	8	7	56	7.17	21.1	478.1	
09:59	11	7	77	7.28	21.9	479.1	T=21.4
10:02	14	7	98	7.28	21.3	479.6	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COB MW-2	10:05	Poly	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-26-10
Well ID:	COB MW-3	Weather:	SUNNY, 70's
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	269
Casing Diameter (in):	4"
Static Water Level (ft bmp):	123.12
Casing Volume (gals):	94
3 Casing Volumes (gals):	285

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
10:21							
10:24	3	23	69	7.07	22.7	483.6	
10:28	7	23	161	7.24	22.0	487.9	
10:31	10	23	230	7.30	21.8	493.5	
10:34	13	23	299	7.35	22.0	497.9	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COB MW-3	10:38	Poly	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.6	Date:	4-26-10
Well ID:	COB. WL	Weather:	Sunny 60's
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	150'
Casing Diameter (in):	4"
Static Water Level (ft bmp):	66.13
Casing Volume (gals):	55
3 Casing Volumes (gals):	165

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
08:53							
08:55	2	7	14	6.69	20.9	1036	
09:00	7	7	49	7.02	20.9	1034	
09:05	12	7	84	7.07	21.0	1042	
09:10	17	7	119	7.34	21.8	1032	
09:15	23	7	161	7.36	21.9	1038	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COB WL	9:17	Poly	250mL	1		Ø	

Additional Comments:

Duplicate DUP042610

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	COLLINS	Weather:	Cloudy, Windy, Cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	320'
Casing Diameter (in):	4.5"
Static Water Level (ft bmp):	291.96'
Casing Volume (gals):	24
3 Casing Volumes (gals):	72

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1217							
1221	4	12	48	6.97	20.1	1486	
1223	6	12	72	6.98	20.3	1477	
1225	8	12	96	6.99	20.6	1472	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COLLINS	1228						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	COOPER	Weather:	cloudy, windy, cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	325'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1248							
1255	7	8	56	7.77	18.0	434	
1304	16	8	128	7.83	17.7	433	
1308	20	8	160	7.82	17.9	433	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COOPER	1312						

Additional Comments: * No access for WL reading

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	COOPER C	Weather:	rainy, Windy, cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	220'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	157.31'
Casing Volume (gals):	93
3 Casing Volumes (gals):	279

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1423							
1429	6	11	66	6.73	19.6	1933	
1439	16	11	176	6.74	19.6	1930	
1449	26	11	286	6.76	19.5	1921	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
COOPER C	1454						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	~~Dodson~~ 1.0	Date:	~~Cloudy~~ 4-19-10
Well ID:	Dodson	Weather:	Cloudy
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	200
Casing Diameter (in):	6"
Static Water Level (ft bmp):	89.53
Casing Volume (gals):	162
3 Casing Volumes (gals):	487

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
13:50							
14:00	10	10	~~50~~ 100	7.15	20.9	1207	
14:10	20	10	~~100~~ 200	7.28	20.4	1242	
14:20	30	10	300	7.45	20.2	1244	
14:30	40	10	406	7.43	20.2	1251	
14:40	50	10	500	7.46	19.9	1261	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Dodson	14:45	PE	250mL	1		Ø	DUP

Additional Comments:

Collected duplicate: ~~DUP~~ DUP041910

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4/14/10
Well ID:	Douglass 791	Weather:	Cloudy
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	36.40
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLO

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4/19/10
Well ID:	Douglass 792	Weather:	Cloudy
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	87.19
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLO

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-26-10
Well ID:	Duraza	Weather:	Sunny 80's
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	N/A
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
11:30							
11:40	10	7	70	7.35	24.5	1091	
11:48	18	7	126	7.28	23.1	1099	
11:54	24	7	168	7.22	23.1	1095	
12:00	30	7	210	7.22	23.1	1099	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Duraza	1203	Poly	250mL	1		Ø	

Additional Comments: No access to well head. Purging until stable.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	EAST	Weather:	sunny, cool, windy
ADWR No:		Sampler:	Travis Tayler

WELL DATA

Well Depth (ft bls):	125'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	58.88'
Casing Volume (gals):	98
3 Casing Volumes (gals):	294

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0820							
0828	8	11	88	7.18	20.3	602	
0834	14	11	154	7.37	20.4	614	
0841	21	11	231	7.42	20.5	616	
0847	27	11	297	7.42	20.5	616	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
EAST	0853						
DUP042110	0853						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:		Date:	4-20-10
Well ID:	Fleming	Weather:	SUNNY
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	315.26
Static Water Level (ft bmp):	
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLG

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	FRANCO	Weather:	windy, cloudy, cold, rain
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	200'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1108							
1116	8	12	96	7.42	16.1	1552	
1123	15	12	180	7.38	15.9	1556	
1128	20	12	240	7.40	15.9	1560	
1133	25	12	300	7.43	15.8	1559	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
FRANCO	1139						

Additional Comments: * obstruction in well, no W/L.
* 5 houses share well.

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-20-10
Well ID:	FULTZ	Weather:	Cloudy, warm
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	300'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	63.82'
Casing Volume (gals):	348
3 Casing Volumes (gals):	1044

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1532							
1538	6	10	60	7.22	23.0	1181	
1556	24	10	240	7.28	22.6	1141	
1616	44	10	440	7.25	21.5	1132	
1638	66	10	660	7.28	21.7	1150	
1701	89	10	890	7.28	21.3	1196	
1717	105	10	1050	7.32	21.2	1202	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
FULTZ	1721						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:		Date:	4-22-10
Well ID:	Garner 557	Weather:	Cloudy 50s
ADWR No:		Sampler:	BJS

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	193.49
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLO

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:		Date:	4-22-10
Well ID:	Garner 635	Weather:	Cloudy 50's
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	680
Casing Diameter (in):	5"
Static Water Level (ft bmp):	196.01
Casing Volume (gals):	493
3 Casing Volumes (gals):	1479

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
09:15							
09:35	20	13	260	7.31	20.9	467.1	
09:55	40	13	520	7.61	23.1	465.6	
10:15	60	13	780	7.73	23.1	464.2	
10:25	70	13	910	7.87	22.7	460.4	
10:55	100	13	1300	7.87	22.4	462.1	
11:10	115	13	1495	7.84	23.7	464.1	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Garner 635	11:15	PE	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-27-10
Well ID:	GGOOSE 547	Weather:	Sunny, Warm
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	800'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	239.17'
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: * unable to get pump running. Circuit breaker kept tripping on pump house box.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:		Date:	6/8/10
Well ID:	GG00 SE 547	Weather:	
ADWR No:		Sampler:	

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	239.67
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: Take SWL befor attempting pump repair

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-9-10
Well ID:	GL-3	Weather:	Sunny ~ 42°
ADWR No:		Sampler:	

WELL DATA

Well Depth (ft bls):	820'
Casing Diameter (in):	4"
Static Water Level (ft bmp):	655.35
Casing Volume (gals):	~~44.05~~ 107
3 Casing Volumes (gals):	321

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0800							
0810	10	8.1	81	6.34	24.6	532	
0820	20	8.1	162	6.30	23.8	539	
0830	30	1.8	216	6.28	24.7	520	
0900	60	1.8	270	6.26	24.9	542	
0915	75	1.8	297	6.19	25.3	555	
0930	90	1.8	324	6.17	25.6	556	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
GL-3	0935	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	GOAB RANCH	Weather:	cloudy, windy, cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	186.44'
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: * WL only

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	10	Date:	5-18-10
Well ID:	HOBAN	Weather:	Sunny 80's
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	316
Casing Diameter (in):	6"
Static Water Level (ft bmp):	165.71
Casing Volume (gals):	222
3 Casing Volumes (gals):	666

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: Could not sample well because there is no electric service currently

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	Howard	Weather:	Sunny 70's
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	200
Casing Diameter (in):	6"
Static Water Level (ft bmp):	152.30
Casing Volume (gals):	48 70
3 Casing Volumes (gals):	210

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
16:00							
16:10	10	5	50	7.04	21.7	1409	
16:20	20	5	100	7.15	21.0	1454	
16:30	30	5	150	7.27	20.5	1470	
16:40	40	5	200	7.16	20.8	1490	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Howard	16:45	PE	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	10	Date:	4/20/10
Well ID:	Keefer	Weather:	Sunny 80s
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	245
Casing Diameter (in):	6"
Static Water Level (ft bmp):	136.26
Casing Volume (gals):	160
3 Casing Volumes (gals):	480

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
15:22							
15:32	10	11	110	6.98	22.0	535.6	
16:02	40	11	440	7.42	21.6	545.9	
16:07	45	11	495	7.39	21.0	532.5	
16:12	50	11	550	7.44	20.5	540.9	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
~~EB~~ keefer	16:15	PE	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	McConnell 265	Weather:	Cool, Cloudy
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	216'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	158.68
Casing Volume (gals):	85
3 Casing Volumes (gals):	255

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
8:08							
8:16	8	10	80	6.88	19.6	1689	
8:18	10	10	100	6.91	20.0	1695	
8:23	15	10	150	6.94	19.9	1702	
8:28	20	10	200	6.94	20.1	1694	
8:33	25	10	250	6.95	20.1	1691	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
McConnell	08:38	PE	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	5-18-10
Well ID:	Metzler	Weather:	Sunny
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	351
Casing Diameter (in):	6
Static Water Level (ft bmp):	288.65
Casing Volume (gals):	93
3 Casing Volumes (gals):	279

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
09:20							
09:35	15	5	75	7.29	21.4	1025	
09:50	30	5	150	7.40	20.2	1021	
10:05	45	5	225	7.72	20.6	1036	
10:20	60	5	300	7.56	21.0	1053	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Metzler	10:25	Poly	500 mL	1	300.0	Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	MOORE	Weather:	Cloudy, cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	220'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0754							
0801	7	10	70	7.52	20.4	434	
0807	13	10	130	7.42	20.4	430	
0814	20	10	200	7.43	19.9	428	
0819	25	10	250	7.47	20.6	433	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
MOORE	0824						

Additional Comments: * No well access (well covered w/ dirt).

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	Ness	Weather:	Partly Cloudy
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	812
Casing Diameter (in):	5"
Static Water Level (ft bmp):	568.11
Casing Volume (gals):	249
3 Casing Volumes (gals):	747

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
09:15							
09:25	10	14	140	7.28	22.2	517.6	
09:40	25	14	350	7.71	23.1	512.7	
09:50	35	14	490	7.66	23.0	516.2	
10:00	45	14	630	7.65	23.4	516.5	
10:10	55	14	770	7.70	23.5	518.9	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NESS	~~10:15~~	PE	250mL	1		Ø	
	10:15						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4/19/10
Well ID:	Noteman	Weather:	Cloudy, some rain
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	400'
Casing Diameter (in):	5"
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	~225 see below

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
12:00							
12:05	5	13	65	6.67	21.6	1461	
12:10	10	13	130	6.81	22.4	1452	
12:19	20	13	260	6.81	22.4	1446.	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NOTEMAN	12:20	PE	250mL	1		Ø	

Additional Comments: Last available water level = 327.59.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	5-25-10
Well ID:	NSD -02	Weather:	SUNNY
ADWR No:		Sampler:	BD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	101.63
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: 120

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	5-25-10
Well ID:	NSD 03	Weather:	Sunny
ADWR No:		Sampler:	BD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	84.49
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLO

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.6	Date:	4-21-10
Well ID:	NWC-02	Weather:	Windy, cool, cloudy
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	312'
Casing Diameter (in):	
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1342	—	117	—	7.57	22.1	413	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-02	1345						

Additional Comments: Well has been running 30 minutes on & 15 minutes off all day.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	NWC-03	Weather:	cloudy, windy, cool
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	312'
Casing Diameter (in):	
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1246	40	57	2280	7.30	21.3	1207	
1251	45	57	2565	7.26	21.4	1193	
1258	52	57	2964	7.22	21.6	1178	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-03	1258						

Additional Comments: Well has been on for 30 minutes prior to arrival.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	NWC-03 CAP	Weather:	Cloudy, windy, cool
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	179'
Casing Diameter (in):	
Static Water Level (ft bmp):	131.86'
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: * WL only

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	NWC-04	Weather:	cloudy, windy, cool
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	795'
Casing Diameter (in):	
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1130							
1212	42	30	1260	7.26	22.7	891	
1216	46	30	1380	7.32	22.6	917	
1218	48	30	1440	7.34	22.8	913	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-04	1220						

Additional Comments: Pump was on 30 minutes prior to arrival.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	HAL 5-18-10
Well ID:	NWC-04	Weather:	Sunny
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
11:04	0	30	—	7.76	25.4	914.5	
11:09	5	30	150	7.64	25.2	903.2	
11:14	10	30	300	7.62	25.5	911.5	
11:19	15	30	450	7.72	25.5	906.4	
11:24	20	30	600	7.59	25.7	904.1	
11:34	30	30	900	7.68	25.8	901.3	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
	11:36						

Additional Comments: Pump has been on. No water level because sounder is broken in well

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:		Date:	6-8-10
Well ID:	NWC-04	Weather:	Sunny
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	795
Casing Diameter (in):	—
Static Water Level (ft bmp):	NA
Casing Volume (gals):	—
3 Casing Volumes (gals):	—

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
10:15				7.34	25.4	901.4	
10:18				7.29	25.0	900.1	
10:21				7.31	24.5	917.5	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-04	10:28	Poly	500mL	1	300.0	Ø	

Additional Comments: Well has been on for >30 min

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	NWC-06	Weather:	cloudy, windy, cool
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	410'
Casing Diameter (in):	
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1320	—	172	—	7.54	22.4	387	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
NWC-06	1325						

Additional Comments: *well has been running 30 minutes on 15 minutes off all day.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4/19/10
Well ID:	Osborn	Weather:	Cloudy
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	258'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	81.59
Casing Volume (gals):	260
3 Casing Volumes (gals):	780

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
15:30							
15:55	25	5	125	7.41	21.4	600.1	
16:20	50	5	250	7.52	21.4	599.2	
16:35	65	5	325	7.57	21.6	599.4	
16:50	80		400	7.60	21.5	601.9	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Osborn	17:00	PE	250 mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	PALMER	Weather:	rainy, cloudy, cold
ADWR No:		Sampler:	Travis Tayler

WELL DATA

Well Depth (ft bls):	220'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1525	—	—	—	7.97	13.6	520	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
PALMER	1529						

Additional Comments: * Sample taken from tank.
* no access to well.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-20-10
Well ID:	Panagakos	Weather:	Sunny
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	200'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	167.11
Casing Volume (gals):	49
3 Casing Volumes (gals):	147

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
16:45							
16:50	5	5	25	7.25	21.5	1484	
16:55	10	~~10~~ 5	50	7.17	21.1	1491	
17:05	20	5	100	7.19	21.3	1516	
17:15	30	5	150	7.25	21.0	1528	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Panagakos	15:20	PE	250mL	1		✓	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	PARRA	Weather:	Cloudy, windy, cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	355'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1609							
1615	6	8	48	6.92	19.7	1236	
1622	13	8	104	6.85	20.3	1215	
1629	20	8	160	6.89	20.1	1223	
1635	26	8	208	6.86	19.8	1213	
1639	30	8	240	6.91	20.3	1219	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
PARRA	1643						

Additional Comments: * unable to get WL because previous sounder tip stuck in well. Will purge til parameters are stable.

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-26-10
Well ID:	PIONKE	Weather:	cloudy, warm
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	300'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	151.32'
Casing Volume (gals):	219
3 Casing Volumes (gals):	657

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1450							
1503	13	17	221	7.27	21.9	1118	
1515	25	17	425	7.24	22.2	1141	
1525	35	17	595	7.25	22.1	1209	
1531	41	17	697	7.22	21.9	1224	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
PIONKE	1538						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	POOL	Weather:	50's Cloudy
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	313
Casing Diameter (in):	6"
Static Water Level (ft bmp):	205.48
Casing Volume (gals):	160
3 Casing Volumes (gals):	480

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
13:30 ~~13:00~~							
13:35	5	16	80	7.49	20.0	604.2	
13:40	10	16	160	7.67	20.0	601.9	
13:50	20	16	320	7.77	19.7	600.6	
13:55	25	16	400	7.78	19.5	602.3	
14:00	30	16	480	7.75	20.2	606.5	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
POOL	14:05	PE	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	RAMIREZ	Weather:	Cloudy, windy, cool
ADWR No:		Sampler:	Travis Tayler

WELL DATA

Well Depth (ft bls):	300'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	159.96'
Casing Volume (gals):	206
3 Casing Volumes (gals):	618

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1526							
1537	11	13	143	7.40	23.1	383	
1553	27	13	351	7.42	22.6	391	
1604	38	13	494	7.43	22.5	397	
1614	48	13	624	7.45	22.6	397	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
RAMIREZ	1618						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-20-10
Well ID:	RAY	Weather:	Cloudy, windy, warm
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	100'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	49.78'
Casing Volume (gals):	74
3 Casing Volumes (gals):	222

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1413							
1422	9	9	81	7.03	22.9	1503	
1429	16	9	144	7.13	21.9	1373	
1434	21	9	189	7.11	21.7	1352	
1439	26	9	234	7.14	21.5	1318	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
RAY	1444						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	Rogers 596	Weather:	Rainy 50's
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	290
Casing Diameter (in):	6"
Static Water Level (ft bmp):	135.62
Casing Volume (gals):	228
3 Casing Volumes (gals):	684

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
15:45							
16:00	15	7	105	7.35	18.7	1664	
16:20	35	7	245	7.26	19.6	1657	
16:40	55	7	385	7.23	19.3	1647	
17:00	75	7	525	7.19	19.4	1648	
17:20	95	7	665	7.21	18.2	1641	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Rogers 596	17:25	PE	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	ROGERS E	Weather:	cloudy, windy, cool
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	290'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	150.97'
Casing Volume (gals):	205
3 Casing Volumes (gals):	615

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1642							
1651	9	12	108	7.36	21.7	419	
1703	21	12	252	7.39	21.5	421	
1713	31	12	372	7.41	21.6	419	
1724	42	12	504	7.46	21.2	419	
1734	52	12	624	7.44	21.1	421	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
ROGERS E	1738						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-26-10
Well ID:	Ruiz	Weather:	Sunny Hot.
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	312
Casing Diameter (in):	6"
Static Water Level (ft bmp):	295.96
Casing Volume (gals):	25
3 Casing Volumes (gals):	75

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
13:30							
13:36	6	5	30	6.99	23.9	921.7	
13:39	9	5	45	7.07	23.0	921.9	
13:43	13	5	65	7.05	22.5	919.5	
13:48	18	5	90	7.01	22.5	920.1	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
RUIZ	13:52	poly	250mL	1		Ø	

Additional Comments: Unable to get accurate discharge because pump is also filling tank.

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	SCHWARTZ	Weather:	cloudy, windy, cool
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	305'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	124.65'
Casing Volume (gals):	266
3 Casing Volumes (gals):	798

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1012							
1022	10	9	90	7.36	21.5	635	
1039	27	9	243	7.43	21.4	635	
1101	49	9	441	7.45	21.4	636	
1121	69	9	621	7.48	21.0	638	
1141	89	9	801	7.50	20.9	638	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
SCHWARTZ	1144						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	9/20/10
Well ID:	Stephens	Weather:	Warm Sunny, 80's
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	51.29
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLO

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	10	Date:	4/19/10
Well ID:	SUNBELT	Weather:	Raining
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	380'
Casing Diameter (in):	
Static Water Level (ft bmp):	DRY
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLO

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	Swan	Weather:	Sunny, Windy, Warm
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	98'
Casing Diameter (in):	4"
Static Water Level (ft bmp):	38.06
Casing Volume (gals):	39
3 Casing Volumes (gals):	117

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
11:05							
11:09	4	11	44	6.97	22.3	529.3	
11:12	7	11	77	7.10	21.3	512.0	
11:15	10	11	110	7.24	21.1	508.1	
11:17	12	11	132	7.42	20.3	512.1	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
Swan	11:20	PE	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-6-10
Well ID:	TM-2a	Weather:	Sunny, breezy 65°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	925'
Casing Diameter (in):	4"
Static Water Level (ft bmp):	353.84
Casing Volume (gals):	371.2
3 Casing Volumes (gals):	1113.6

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1125							
1130	5	7.5	37	7.04	22.1	362	
1215	50	5.5	375	7.07	24.7	354	
1305	100	5.5	550	7.18	25.6	349	
1353	150	3.3	825	7.20	25.4	353	
1422							Broke suction
1430							Started pump 4-7-10
1450				6.96	24.6	363	613.16 - 4-7-10

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-2A	1450	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments: Broke Suction @ 1422
Sounded @ 0800 4-7-10 no water @ 525'
Sounded @ 4-7-10 @ 1430 @ water level @ 613.16
Sampled 4-7-10 @ 1450

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-14-10
Well ID:	TM-3	Weather:	Sunny 42"
ADWR No:		Sampler:	Christoph Ehrmann

WELL DATA

Well Depth (ft bls):	200'
Casing Diameter (in):	4"
Static Water Level (ft bmp):	130.36
Casing Volume (gals):	45.1
3 Casing Volumes (gals):	135.3

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0630							
0635	5	12	60	7.53	20.0	634	
0640	10	12	120	7.50	20.4	617	
0645	15	12	180	7.52	20.4	631	
0650	20	12	24	7.55	20.6	635	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-3	0650	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-14-10
Well ID:	TM-6	Weather:	Sunny 60°
ADWR No:		Sampler:	Christopher L. Sherman

WELL DATA

Well Depth (ft bls):	200'
Casing Diameter (in):	4"
Static Water Level (ft bmp):	159.02
Casing Volume (gals):	26.6
3 Casing Volumes (gals):	79.8

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0835				7.31			
0840	5	11.5	57	~~7.29~~	19.8	478	
0845	10	11.5	115	7.32	19.5	462	
0850	15	11.5	172	7.35	19.4	461	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-6	0850	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	5-25-10
Well ID:	TM-7	Weather:	Sunny, 77°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	350'
Casing Diameter (in):	4"
Static Water Level (ft bmp):	NA
Casing Volume (gals):	NA
3 Casing Volumes (gals):	NA

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1238							
1240	2	10	20	7.20	23.2	336	
1255	"	"	"	"	"	"	
1257	4	10	40	7.28	20.8	351	
1312	"	"	"	"	"	"	
1314	6	10	60	7.27	21.2	398	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-7	1314	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-27-10
Well ID:	TM-15 Miller	Weather:	Sunny 70s
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	325 **
Casing Diameter (in):	4"
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
09:05							
09:15	10	6	60	7.41	22.0	389.2	
09:25	20	6	120	7.76	22.8	384.6	
09:30	25	6	150	7.78	23.1	383.7	
09:35	30	6	180	7.71	23.0	383.6	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-15 miller	09:38	Poly	250mL	1		Ø	

Additional Comments: No WL because old sounder is in well

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-14-10
Well ID:	TM-16	Weather:	Sunny 45°
ADWR No:		Sampler:	Chr. Stagler & Sherman

WELL DATA

Well Depth (ft bls):	115
Casing Diameter (in):	4"
Static Water Level (ft bmp):	83.22
Casing Volume (gals):	20.6
3 Casing Volumes (gals):	61.8

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0740							
0745	5	21	105	6.86	19.9	984	
0750	10	21	210	6.90	20.0	982	
0755	15	21	315	6.90	19.7	987	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-16	0755	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-9-10
Well ID:	TM-19A	Weather:	Sunny, breezy - 74
ADWR No:		Sampler:	Chastaple & Sherman

WELL DATA

Well Depth (ft bls):	700
Casing Diameter (in):	4"
Static Water Level (ft bmp):	201.5
Casing Volume (gals):	323.9
3 Casing Volumes (gals):	971.7

Casing Capacity	
Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1245							
1250	5	33	165	6.45	21.8	412	
1300	15	33	495	6.43	22.6	430	
1310	25	33	825	6.46	22.9	436	
1320	35	33	1155	6.49	23.0	435	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-19A	1325	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

9 Sac'

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-19-10
Well ID:	TM-42	Weather:	Cloudy - 56°
ADWR No:		Sampler:	Christopher L Sherman

WELL DATA

Well Depth (ft bls):	250
Casing Diameter (in):	5"
Static Water Level (ft bmp):	213.51
Casing Volume (gals):	37
3 Casing Volumes (gals):	111

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0630							
0640	10	1	10	6.84	21.7	1003	
0700	30	1	30	6.90	21.5	980	
0730	60	1	60	6.83	21.1	1004	
0800	90	1	90	6.85	21.4	999	
0830	120	1	120	6.87	21.5	985	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TM-42	0830	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments:

36.19

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	TVI 236	Weather:	40's
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	222
Casing Diameter (in):	12"
Static Water Level (ft bmp):	122.70
Casing Volume (gals):	615
3 Casing Volumes (gals):	1850

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
09:32							
09:36	4	100	400	7.11	18.8	507.3	
09:40	8	100	800	7.40	19.6	506.4	
09:44	12	100	1200	7.48	20.0	505.0	
09:50	18	100	1800	7.46	20.0	564.6	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TVI 236	09:52	PE	250mL	1		∅	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	TVI 713	Weather:	Cool. Rainy/Snowy
ADWR No:		Sampler:	BSD

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	127.53
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments

Additional Comments: WLO

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-23-10
Well ID:	TVI 875	Weather:	Cold Snowy / Rainy
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	330
Casing Diameter (in):	8
Static Water Level (ft bmp):	N/A* 127.53
Casing Volume (gals):	529
3 Casing Volumes (gals):	1590

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
09:02							
09:04	2	500	1000	6.87	19.6	871.1	
09:06	4	500	2000	6.95	20.3	933.1	
09:07	5	500	2500	7.05	20.5	953.3	
09:12	10	500	5000	7.34	20.2	930.4	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
TVI 875	09:15	PE	250mL	1		C	

Additional Comments: *SWL = 127.53 at TVI 713

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:		Date:	4-26-10
Well ID:	WEED	Weather:	Cloudy, warm
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	320'
Casing Diameter (in):	
Static Water Level (ft bmp):	N/A
Casing Volume (gals):	N/A
3 Casing Volumes (gals):	N/A

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1553							
1558	5	17	85	7.70	22.5	365	
1611	18	17	306	7.74	22.2	364	
1615	22	17	374	7.69	22.1	366	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
WEED	1620						

Additional Comments:

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Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	Weiskopf	Weather:	Raining, 50's
ADWR No:		Sampler:	BJD

WELL DATA

Well Depth (ft bls):	200
Casing Diameter (in):	6"
Static Water Level (ft bmp):	145.72
Casing Volume (gals):	80
3 Casing Volumes (gals):	240

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
14:30							
14:40	10	7	70	7.40	17.7	1283	
14:45	15	7	105	7.39	18.6	1304	
14:50	20	7	140	7.34	19.5	1313	
15:00	30	7	210	7.30	19.3	1329	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
WEISKOPF	15:10	PE	250mL	1		Ø	

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-22-10
Well ID:	ZANDER	Weather:	cloudy, cold
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	280'
Casing Diameter (in):	6"
Static Water Level (ft bmp):	146.27'
Casing Volume (gals):	197
3 Casing Volumes (gals):	591

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
0854				7.46			
0902	8	13	104	~~20.2~~	20.2	416	
0914	20	13	260	7.49	20.4	416	
0928	34	13	442	7.53	20.1	415	
0940	46	13	598	7.55	20.0	416	

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
ZANDER	0944						

Additional Comments:

CLEAR CREEK ASSOCIATES

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-13-10
Well ID:	EQBL-tube	Weather:	Sunny
ADWR No:		Sampler:	Christopher L Sharma

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1200							

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BF-4	1200	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments: Equipment Blank - tubing and filter used on sewer wells

Filtered

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-13-10
Well ID:	FB-41310	Weather:	Sunny 70
ADWR No:		Sampler:	Christopher L Stevens

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1300							

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BF-3	1300	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments: Field Blank

Not Filtered

Groundwater Sampling Form

Project No:		Client:	Freeport Copper Queen Branch
Task No:		Date:	4-13-10
Well ID:	EQ BL - pump	Weather:	Sunny
ADWR No:		Sampler:	Christopher L Shuran

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity

Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments
1705							

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
BF-4A	1705	plastic	250 ml	1	EPA 300.0	none	filtered

Additional Comments: Equipment blank using pump for older wells

NOT Filtered

Groundwater Sampling Form

Project No:	055038	Client:	Freeport Copper Queen Branch
Task No:	1.0	Date:	4-21-10
Well ID:	EQB042110/FB042110	Weather:	Sunny, windy, cool
ADWR No:		Sampler:	Travis Taylor

WELL DATA

Well Depth (ft bls):	
Casing Diameter (in):	
Static Water Level (ft bmp):	
Casing Volume (gals):	
3 Casing Volumes (gals):	

Casing Capacity	
Nominal Size (inches)	Gallons per Linear Foot
2	0.16
4	0.65
5	1.02
6	1.47
8	2.61
10	4.08

Casing Volume = gallons/foot * water column (feet)

FIELD SAMPLING DATA

Time	Elapsed Time (min)	Discharge Rate (gpm)	Total Discharge (gallons)	pH (SU)	Temp (°C)	Specific Conductance (µS/cm)	Comments

SAMPLE INFORMATION

Sample ID	Time	Container Type	Volume	No. of Containers	Analysis Method	Preservative	Comments
EQB042110	0907						
FB042110	0901						

Additional Comments:

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