LEACHED ORE RINSE TEST REPORT
GUNNISON COPPER PROJECT

COCHISE COUNTY, ARIZONA

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1 Analytical Laboratory Reports

1.0 INTRODUCTION

This report describes the results of the rinse tests performed on leached ore from the Gunnison copper deposit in Cochise County, Arizona. The rinse tests were performed on leached ore samples by Mineral Advisory Group Research & Development (MAG R&D) and overseen by Leach, Inc. (Leach) for Excelsior Mining Corporation (Excelsior). Two configurations were used to perform the leach tests: 1) crushed ore in column tests, and 2) isolated fracture surfaces in core tray tests. Clear Creek Associates, PLC (Clear Creek) was retained by Excelsior to analyze the data and prepare this report in support of the closure plan and the geochemical modeling for Excelsior's Aquifer Protection Permit (APP) application with the Arizona Department of Environmental Quality (ADEQ) and its Underground Injection Control (UIC) permit application with the United States Environmental Protection Agency (EPA). Clear Creek also provided input on the analytical suites and provided analytical laboratory oversight for the core tray rinse tests.

Excelsior Mining Corp (Excelsior) is proposing to develop the Gunnison Copper Project utilizing in-situ recovery (ISR) methods to produce copper from the ore body. The leached ore body will require closure after mining activities cease. The proposed closure strategy for reducing acidity (increasing pH) and reducing solute concentrations in the leached ore body consists of three steps:

1) an initial rinsing period with groundwater (rinse water) to remove the majority of the pregnant leach solution (PLS) in contact with the leached ore via advection.
2) a rest period with no injection of fresh rinse solution. Incorporating a rest period into the closure strategy is more efficient than continual rinsing because dispersion and other processes may decrease the rate at which PLS is removed and the longer contact time between the solution and the fracture surfaces results in greater increase in pH by silicate dissolution. Raising the pH results in most solutes precipitating as secondary minerals or adsorbing to mineral surfaces.
3) a final rinse to reduce the concentrations of solutes that still exceed their respective AWQSs after the rest period.

The rinse-rest-rinse strategy assumed that the post-production ore body would be rinsed with potable groundwater prior to the rest period to reduce the PLS concentration in the groundwater to 5%. Excelsior used a geochemical model to evaluate the effectiveness of a rinse-rest-rinse closure strategy for removal of PLS from the subsurface after the cessation of mining (Appendix H-2). The geochemical model simulations assumed that the rest period would begin when the fluid chemistry reached a mixture of 5% PLS and 95% groundwater following the initial rinsing period.

Laboratory rinse tests were performed to support the geochemical modeling of the rinse-rest-rinse approach to site closure. The rinse analysis presented here develops a relationship between solute concentration in extracted rinse water and the amount of rinse water applied (expressed in pore volumes [PVs]). Based on the rinse analysis, the amount of rinsing required to reduce the PLS in the ore body to 50%, 10%, and 5% were estimated.

The concentrations of free acid and selected dissolved inorganic constituents were used to develop the relationship between extracted solute concentration and the applied rinse water volume.

2.0 TEST METHODOLOGY

Laboratory tests were performed on core samples to simulate future ISR at the Gunnison Project. Copper was extracted from oxide minerals lining the fractures of the ore body by leaching with sulfuric acid. The leached core samples containing PLS[1] were then rinsed with clean water[2] and the chemistry of the rinsate samples was analyzed. Two different types of rinse tests were performed: 1) core crushed to less than one inch and leached was rinsed with clean water under submerged conditions in column tests (December 2012 through February 2013) and 2) leached fracture surfaces were rinsed by flowing clean water over the core fractures in core tray tests (June through July 2015). Two rinsing protocols were used;

1) rinse-only tests where the leached ore was continually flushed with clean water (core-tray tests), and
2) rinse-rest-rinse tests where the leached ore was flushed with a specified amount of clean water, allowed to rest for a specified period of time, and flushed again with a specified amount of clean water (both column and core-tray tests); this procedure was repeated for the duration of the tests.

2.1 Column Tests

Four columns[3] with leached ore were rinsed with clean water to evaluate the removal of PLS via the rinse-rest-rinse protocol. Column feed samples for the initial leach tests were selected from the available PQ core samples (85 millimeter diameter) to represent the different formations containing copper in the project area. Ore was crushed to less than 1 inch. Approximately 80 pounds (36 kilograms) were loaded into 6-inch inner diameter columns (15.24 centimeters). The bed height of the crushed ore was approximately 120 centimeters. The column test parameters are presented in Table 1 and the rinsing protocols are presented in Table 2. The pore volumes (PVs) ranged from 8.0 to 8.7 liters (l). The leached ore samples were used for the rinse tests; the PLS was not drained from the columns prior to the application of the rinse water.

Rinse water (tap water from MAG R&D's laboratory, Table 3) was pumped from a tank and applied to the top of the columns (Figure 1). A siphon break in the discharge tube was used to maintain saturation. The solution was applied at approximately 10 liters per day (lpd), or slightly more than one PV per day. The rinsate[4] was collected in a tank on the discharge side of the

[1] Pregnant leach solution is defined as leach solution loaded with copper.
[2] Clean water (rinse water) in this report is defined as tap water from MAG R&D or groundwater from the John Camp mine site.
[3] Three other columns were subjected to at least some rinsing but not addressed in this report. Columns CL-08 and CL-13 were rinsed an insufficient amount for the analyses of the initial rinse (< three PVs). Column CL-10 rinsate sample volumes were too large to evaluate the initial rinse behavior (~1.8 PV).
[4] The rinsate is defined as any effluent from the column or core tray tests from the start of rinse water application to the column or core tray inlet. The initial rinsate will contain mainly PLS but that PLS fraction will decrease as more rinse water is applied.

column and pH and oxidation-reduction potential (ORP) of the daily composite samples were measured. Splits of the composite samples were sent to SGS Metcon (SGS) in Tucson, Arizona, for a 30-element Inductively-Coupled Plasma (ICP) scan.

2.2 Core Tray Tests

The core tray consisted of carefully mounted selected core samples with the natural fracture faces lined facing upwards in a bed of epoxy (Figure 2). The sides of the cores were coated with epoxy so the leach and rinse solutions only contacted the fracture surfaces. The core trays were nine feet long, constructed from sheets of Plexiglas, and sealed water tight. Inlet and outlet connections were installed on either end of the core tray for solution application and collection. The void volume (i.e. PV) between the fracture surfaces and the top of the core trays ranged from 2.4 to 2.9 liters. The leached ore samples were used in the rinse tests; the PLS was not drained from the core trays prior to the application of the rinse water. Core tray rinse test parameters are presented in Table 4.

The core trays were rinsed with either tap water from MAG R&D's laboratory or well water from Johnson Camp mine (JC water) (Table 3). The two rinsing protocols used were different than for the column tests:

- Core tray CT-08 was continually flushed with rinse water at a rate of approximately 0.4 PV per day. The first six days CT-08 was flushed with MAG R&D tap water, afterwards it was flushed with JC water.
- Core trays CT-04, CT-05, CT-09, and CT-10 were subjected to a rinse-rest-rinse cycle. Approximately one PV of MAG R&D tap water was applied to each core tray, and then allowed to rest in the core tray for six days (during the first rest period) or for five days for the subsequent rest periods. MAG R&D tap water was used for the first rinse and JC water was used after that. The extraction of the rinsate was performed in two ways:
    - the rinsate was displaced by applying rinse water to the inlet of the core trays for the first two rinse cycles, and
    - the rinsate was drained from the core trays by elevating the inlet end of the core tray and opening a valve at the outlet end. After draining, the outlet was closed and rinse water was applied to refill the core tray.

Rinsate samples were composited over one day for CT-08 or one rinse cycle for CT-04, CT-05, CT-09, and CT-10. MAG R&D measured pH, ORP, and free acid on splits from the composite rinsate samples.

Select splits of rinsate samples from core tray CT-08 were sent to SVL Analytical, Inc. (SVL) in Kellogg, Idaho, for analyses of select major anions and cations, and select trace elements. The initial objective for analyzing the rinsate was to evaluate the relative effects of continual rinsing versus the rinse-rest-rinse model on:

- pH control[5], and
- the reduction of solute concentrations to meet Arizona Aquifer Water Quality Standards (AWQSs).

Once the rinsate had reached pH 5, samples were analyzed for constituents with AWQSs; for the metals aluminum, copper, iron, manganese, nickel, silver, and zinc; and the major anions chloride and sulfate.

The core tray rinse tests ran for 37 days which is shorter than the proposed field rest time (one year), and therefore the tests were insufficient in duration to evaluate the rate-limiting processes in the context of field operations. The data collected from the last four CT-08 rinsate samples (26 to 32 days) were deemed not representative of field conditions.

To support the geochemical modeling of the rinse-rest-rinse closure strategy, samples from the first few PVs of rinsing were analyzed for select constituents to evaluate the advective-dispersive rinsing of PLS from the leached ore (see Section 4.0).

[5] Raising the pH is a critical part of the closure strategy to control the aqueous solute concentrations. Increased pH results in the precipitation of secondary minerals and the sorption of solutes to mineral surfaces.

3.0 RESULTS

The results of the leached ore rinse tests are summarized below. Analysis of the data is presented in Section 4.0.

3.1 Column Tests

Selected rinsate analytical results for the column tests are presented in Tables 5 through 8.[6] The analytical data are presented in tabulated form from SGS Metcon in Exhibit 1. The data indicate that, with the exception of calcium and sodium, the analyte concentrations decreased as rinsing progressed. The rates of change in analyte concentrations decreased after the first few PVs of rinse. The decrease in rate is most likely controlled by rate-limiting processes such as mineral dissolution and precipitation, diffusion from the rock matrix and/or the leach layer, and sorption/desorption reactions.

3.2 Core Tray Tests

The pH, ORP, and free acid results of the core tray rinse tests are presented in Tables 9 and 10. The free acid content ranged from 6.34 to 11.03 grams per liter (gpl) in the PLS and decreased to below the detection limit of 0.23 gpl within 4 PVs of rinse water application to the core trays.

Analytical results for the CT-08 rinsate samples and for the rinse waters are presented in Table 11. The analytical reports are in Exhibit 1. The data indicate that the analyte concentrations decreased as rinsing progressed. Similar to the column tests, the rates of change in analyte concentrations decreased after the first few PVs of rinse (Section 3.1).

[6] The analytes included in Tables 5 through 8 were aluminum, calcium, copper, iron, magnesium, manganese, potassium, sodium, and zinc. The other analytes from the 30-element ICP scan were either non-detect for all samples, were detected in less than five samples from a column test, or were not measured in the rinse water (Exhibit 1).

4.0 RINSE ANALYSIS

The geochemical model simulations used a ratio of 5% PLS and 95% groundwater for solute concentrations at the beginning of the rest period. Select analytical data (column and core tray tests) and free acid data (core tray tests) were used to evaluate the initial flushing of PLS from the leached ore to determine the percent PLS in the rinsate as a function of rinse water applied. The rationales for using or excluding select analytes from the rinse analysis are presented in Sections 4.1 and 4.2. The relative rates of change in solute concentrations were determined by normalizing solute concentrations to the initial PLS and the rinse water concentrations via the following equation:

$$\mathbf{C_{N,v} = (C_v - C_{rinse})/(C_{PLS} - C_{rinse})}$$

where $C_{N,v}$ is the normalized concentration when the rinse volume v has been applied (in PVs, also termed rinsate eluted), C_v is the measured concentration at v, and C_{rinse} and C_{PLS} are the rinse water and PLS concentrations, respectively. The normalized concentrations, $C_{N,v}$, are plotted on a log scale versus PVs of rinse water applied (or rinsate eluted), and the slope of the data are evaluated. A change in slope indicates a change in the controlling mechanism(s).

The normalized concentrations versus rinsate PVs eluted[7] generally show rinsing occurs in two separate stages (see Sections 4.1 and 4.2). The initial rinse should mainly be controlled by advection and dispersion; these processes appear to be dominant through the first 3 to 4 PVs. A change in the slope after 3 to 4 PVs indicates a change in mechanisms where rate-limited processes such as precipitation, dissolution, sorption/desorption, and diffusion, etc., control the aqueous concentrations. Exponential functions were fitted to the first 3 to 4 PVs of rinsate data to estimate the required number of PVs of applied rinse water to reach 50%, 10 %, and 5% PLS in the rinsate.

4.1 Column Tests

Normalized column test rinsate concentrations ($C_{N,v}$) were calculated for aluminum, calcium, copper, iron, magnesium, manganese, potassium, sodium, and zinc. The other elements in the 30-element ICP scans were near or below detection limits and not used in the rinse analysis. The analytical data of the MAG R&D tap water sample from July 23, 2015, was used for C_{rinse}[8]. The

[7] The normalized concentrations were plotted at the center of the range in PVs for each sample (i.e. a sample collected from 0 to 1 PV would be plotted at 0.5 PV). Each sample represents an average of the rinsate concentration over the entire sample collection period, thereby overestimating the rinsate concentration at the end of a composite sample for a constituent decreasing in concentration. Plotting the normalized average concentration at the end of the collection period would overestimate the flushing required to reach a desired concentration.

[8] The water quality of the MAG R&D tap water was not expected to change significantly over the time between the execution of the column rinse tests in 2012–2013 and the collection of the MAG R&D tap water sample on July 23, 2015, and any difference would be small in comparison to the difference between C_{PLS} and C_{rinse}, and therefore would not significantly affect the analyses.

PLS concentrations (C_{PLS}) were set equal to the concentrations of the first rinsate samples collected when rinse water was applied to the columns.

The initial composite rinsate samples were approximately one PV (0.9 to 1.1 PVs), and therefore the initial samples will contain some rinse water due to dispersive mixing[9]. The presence of rinse water in the "PLS" samples results in underestimations of the true values of C_{PLS}, and decreases the estimated rate at which $C_{N,v}$ decreases. The use of an initial rinsate sample with some rinse water to represent C_{PLS} is considered conservative for the rinse analysis since it overestimates the percentage of PLS in the rinsate ($C_{N,v}$) as a function of rinse volume.

The normalized concentrations are plotted versus rinsate PVs in Figures 3 through 6. Aluminum, iron, magnesium, manganese, and zinc show similar concentration profiles. Other constituent concentration profiles deviate from those five elements and are most likely controlled by processes other than simple advection and dispersion in the first few PVs:

- the slower rate of decrease in the normalized copper concentrations may be due to continued leaching from copper oxide minerals at low pH,
- the near constant calcium concentration may be due to dissolution of gypsum, and
- the slower rate of decrease in potassium and sodium concentrations may be due to dissolution of jarosite and/or aluminum hydroxysulfate minerals.

The normalized concentrations of aluminum, iron, magnesium, manganese, and zinc for the first four samples of each core tray test were averaged and plotted versus rinse PVs applied (Figure 7). Exponential functions were fit to each set of data to estimate the number of PVs required to reach 50%, 10%, and 5% of the initial concentration in the rinsate (Table 12).
The resulting estimates will be discussed in Section 5.0.

4.2 Core Tray Tests

4.2.1 Free Acid

The free acid concentrations were normalized to the free acid concentration of the last leach sample (C_{PLS}). The rinse water had a free acid concentration of zero. The normalized free acid concentrations versus rinsate PVs are presented on Figure 8. Exponential functions were fit to each set of data to estimate the number of PVs required to reach 50%, 10%, and 5% of the initial concentration in the rinsate (Table 12). The resulting estimates will be discussed in Section 5.0.

[9] If no dispersion occurred when rinse water was applied to the leached ore, the first PV of "rinsate" would actually only contain the PLS present in the column at the time of rinse water application.

4.2.2 CT-08 Analytical Results

Based on the analysis of the data from the later rinsate samples collected from CT-08 (post rinse day 26), the following constituents were analyzed by SVL for the rinse analysis: aluminum, barium, beryllium, cadmium, chloride, fluoride, iron, manganese, nickel, sulfate, and zinc.[10] The last leach sample concentrations (samples from June 11, 2015) were used for C_{PLS}, and the JC water concentrations were used for C_{rinse}. The normalized concentrations of most of the analytes decreased at a similar rate (Figure 9). The exceptions were:

- Barium which initially increased in concentration,
- Chloride which increased in concentration from 46.5 at 0.5 PV to 425 mg/l at 2.1 PVs, and
- Copper which decreased more slowly than the other analytes which may be due to continued copper oxide leaching.

The normalized concentrations for aluminum, beryllium, cadmium, fluoride, iron, manganese, nickel, sulfate, and zinc were averaged and plotted versus rinse PVs applied (Figure 10). An exponential function was fit to the data and the number of PVs required to reach 50%, 10%, and 5% of the initial concentration in the rinsate (Table 12). The resulting estimates will be discussed in Section 5.0.

[10] Antimony, arsenic, chromium, lead, mercury, nitrate, selenium and thallium were below their respective AWQSs and were not analyzed for the rinse analysis. Silver and uranium concentrations were very low and not included in the rinse analysis.

5.0 DISCUSSION OF RINSE ANALYSIS

The results of the rinse analysis are summarized in Table 12. On average, the application of approximately one, two, and three PVs of rinse water were required to reduce the rinsate PLS fraction to 50%, 10%, and 5%

The results can be separated into two categories based on the measured parameters: 1) free acid measured by MAG R&D, and 2) analytes measured at an analytical laboratory. The average estimated values of percent PLS as a function of PVs rinse water applied for the free acid analyses were lower than for the laboratory analytes. The lower average percent PLS values for the free acid analyses may be due to the fact that the free acid could be consumed by residual copper ore and/or gangue minerals, enhanced by the fact that the rinsate rested in the core trays in four of the five tests. This free acid consumption would result in a quicker decrease in relative concentrations.

The values of percent PLS as a function of PVs rinse water applied estimated with the analytical laboratory data show slightly higher values, with three PVs of rinse water application required to reduce the rinsate PLS fraction to 5%. This may be due to better accuracy and precision by the analytical laboratories, and a greater difference to the C_{PLS} values and the minimum detection limits.

The results of this rinsing analysis support two assumptions used in the geochemical modeling performed by Duke HydroChem for the rinse-rest-rinse closure strategy proposed by Excelsior for the Gunnison Project:

- rinsing the leached ore with approximately three PVs of rinse water reduces the PLS concentration of the extracted water to approximately 5% or less, and
- applying approximately two PVs of rinse solution after the rest cycle will reduce solute concentrations by approximately 90% (depending on rinse water quality) to meet AWQSs.

TABLES

TABLE 1
Rinse Column Test Parameters

Column ID	Formation	Bed Height	Column Inside Diameter	Ore Mass	Specific Gravity	Pore Volume
		(cm)	(cm)	(kg)		(l)
CL-07	Middle/Upper Abrigo	113	15.24	36.08	2.86	8.00
CL-09	Lower Abrigo	120	15.24	36.06	2.70	8.53
CL-11	Lower Abrigo	121	15.24	36.10	2.70	8.70
CL-12	Lower Abrigo	121	15.24	36.10	2.70	8.70

Notes: cm = centimeters; kg = kilograms; l = liters

TABLE 2
Column Rinse Protocols

Column ID	Formation	Number of Days Leached	Rinse Day																			Total Rinse Time
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	…	(Days)
CL-07	Middle/Upper Abrigo	94	R	R	-	R	R	-	R	R	-	R	R	-	R	R	-	R	R	-	…	27
CL-09	Lower Abrigo	59	R	-	-	R	-	-	R	-	-	R	-	-	R	-	-	R	-	-	…	38
CL-11	Lower Abrigo	59	R	R	-	-	R	R	-	-	R	R	-	-	R	R	-	-	R	R	…	25
CL-12	Lower Abrigo	59	R	R	-	-	-	-	R	R	-	-	-	-	R	R	-	-	-	-	…	41

Notes: R = application of 10 liters per day rinse water; - = rest; "…" = sequence continued to end of test

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TABLE 3
Rinse Water Analytical Results

Sample ID		AWQS	MAG R&D TAP WATER	JC WATER
Total Alkalinity	(mg/l)	NA	109	142
Aluminum	(mg/l)	NA	<0.04	<0.04
Antimony	(mg/l)	0.006	<0.00019	<0.00019
Arsenic	(mg/l)	0.005	0.00598	0.00483
Barium	(mg/l)	2	0.0894	0.0303
Beryllium	(mg/l)	0.004	<0.000048	<0.000048
Cadmium	(mg/l)	0.005	<0.000072	<0.000072
Calcium	(mg/l)	NA	71.4	20.0
Chloride	(mg/l)	NA	73.9	39.1
Chromium	(mg/l)	0.1	0.0047	0.0092
Copper	(mg/l)	NA	0.0184	0.00136
Fluoride	(mg/l)	4	0.71	1.15
Iron	(mg/l)	NA	<0.048	<0.048
Lead	(mg/l)	0.05	<0.000031	0.00102
Magnesium	(mg/l)	NA	9.08	22.4
Manganese	(mg/l)	NA	0.000416	0.000952
Mercury	(mg/l)	0.002	<0.00004	<0.00004
Nickel	(mg/l)	NA	0.0038	0.0009
Nitrate/Nitrite as N	(mg/l)	10	1.47	1.21
pH	(su)	NA	7.93	7.81
Potassium	(mg/l)	0.05	2.86	1.84
Selenium	(mg/l)	0.05	0.0076	0.0013
Silver	(mg/l)	NA	<0.000021	<0.000021
Sodium	(mg/l)	NA	59.7	11.7
Sulfate as SO_4	(mg/l)	NA	173.0	91.5
Thallium	(mg/l)	0.002	<0.000026	<0.000026
Total Diss. Solids	(mg/l)	NA	505	211
Zinc	(mg/l)	NA	0.0113	0.0061

Notes: mg/l = milligrams per liter, su = standard units, AWQS = aquifer water quality standard NA = not applicable

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TABLE 4
Core Tray Rinse Test Parameters

Core Tray	Formation	Rinse Protocol [a]	Surface Area of Cores	Pore Volume	Mass of Samples
ID			(ft^2)	(l)	(kg)
CT-04	Martin	Rinse/Rest	3.43	2.4	29.0
CT-05	Upper Abrigo	Rinse/Rest	3.51	2.8	31.0
CT-08	Martin	Continual Rinse	2.26	2.5	25.0
CT-09	Middle Abrigo	Rinse/Rest	3.05	2.4	41.0
CT-10	Lower Abrigo	Rinse/Rest	3.39	2.9	40.0

Notes: ft^2 = square feet; l = liters; kg = kilograms

[a] Rinse protocol: Rinse/Rest - rinse water remained in the core tray 5 to 7 days prior to being flushed or drained; Continual Rinse - rinse water was continually applied to the core tray at a rate of approximately 0.4 pore volumes per day.

TABLE 5
Column Rinse Test CL-07 Rinsate Analytical Results

Sample ID	Sample Date	Rinse Duration	Cumulative Rinsate Volume Eluted	Rinsate Pore Volumes	pH	ORP	Aluminum, dissolved	Calcium, dissolved	Copper, dissolved	Iron, dissolved	Magnesium, dissolved	Manganese, dissolved	Potassium, dissolved	Sodium, dissolved	Zinc, dissolved
		(days)	(ml)		(su)	(mV)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
CL-07 Wash Solution 95	01/19/13	1	7850	0.98	1.50	457	8,708	590	107	860	8479	2119	256	228	1169
CL-07 Wash Solution 96	01/20/13	2	10940	2.35	2.01	445	1,044	526	76	82	1321	320	96	185	180
CL-07 Wash Solution 98	01/22/13	4	9620	3.55	2.31	428	305	543	66	18	470	103	60	184	64
CL-07 Wash Solution 99	01/23/13	5	9540	4.75	2.50	423	127	597	32	6	205	41	38	151	28
CL-07 Wash Solution 101	01/25/13	7	9460	5.93	2.56	415	97	594	34	4	165	31	37	171	22
CL-07 Wash Solution 102	01/26/13	8	9120	7.07	2.61	444	99	638	22	6	141	26	36	210	20
CL-07 Wash Solution 104	01/28/13	10	9910	8.31	2.53	459	89	642	24	4	133	24	32	156	17
CL-07 Wash Solution 105	01/29/13	11	9480	9.49	2.58	470	74	639	14	3	97	17	23	160	12
CL-07 Wash Solution 107	01/31/13	13	9920	10.73	3.13	500	49	618	14	<1	71	11	20	159	8
CL-07 Wash Solution 108	02/01/13	14	9220	11.89	3.27	568	39	631	9	<1	51	7	21	170	5
CL-07 Wash Solution 110	02/03/13	16	9900	13.12	2.62	464	113	796	27	27	147	27	136	337	72
CL-07 Wash Solution 111	02/04/13	17	8950	14.24	3.34	427	32	655	7	<1	47	6	22	163	5
CL-07 Wash Solution 113	02/06/13	19	9840	15.47	3.40	429	32	662	8	<1	47	6	19	160	5
CL-07 Wash Solution 114	02/07/13	20	9800	16.70	3.69	432	26	659	5	1	38	5	20	171	4
CL-07 Wash Solution 116	02/09/13	22	9400	17.87	3.54	452	29	640	5	<1	41	5	20	165	5
CL-07 Wash Solution 117	02/10/13	23	9930	19.12	4.11	454	25	643	3	<1	31	4	19	158	3
CL-07 Wash Solution 119	02/12/13	25	9800	20.34	4.72	324	21	622	3	<1	29	3	15	150	3
CL-07 Wash Solution 120	02/13/13	26	8900	21.45	5.87	241	22	654	<1	2	27	3	25	203	3
CL-07 Wash Solution 121	02/13/13	26	7020	22.33	6.13	290	12	641	<1	<1	26	3	12	149	2

Notes: ml = milliliters; su = standard units; mV = millivolts; mg/l = milligrams per liter; NA = not applicable; NM = not measured, ORP = oxidation-reduction potential

TABLE 6
Column Rinse Test CL-09 Rinsate Analytical Results

Sample ID	Sample Date	Rinse Duration	Cumulative Rinsate Volume Eluted	Rinsate Pore Volumes	pH	ORP	Aluminum, dissolved	Calcium, dissolved	Copper, dissolved	Iron, dissolved	Magnesium, dissolved	Manganese, dissolved	Potassium, dissolved	Sodium, dissolved	Zinc, dissolved
		(days)	(ml)		(su)	(mV)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
CL-09 Wash Solution 60	12/15/12	1	9380	1.10	1.05	429	9,979	626	101	1612	8993	2320	378	214	1219
CL-09 Wash Solution 61	12/16/12	2	10120	2.28	1.55	430	2,694	592	40	485	2726	680	154	191	360
CL-09 Wash Solution 64	12/19/12	5	9480	3.40	2.43	420	172	617	23	50	205	43	114	259	36
CL-09 Wash Solution 67	12/22/12	8	9400	4.50	2.74	407	83	631	13	16	91	17	32	165	11
CL-09 Wash Solution 70	12/25/12	11	10300	5.70	2.87	394	53	670	11	10	58	9	23	158	6
CL-09 Wash Solution 73	12/28/12	14	10500	6.93	3.04	436	53	642	6	6	50	8	17	168	6
CL-09 Wash Solution 76	12/31/12	17	9620	8.06	3.12	441	28	707	6	3	32	4	14	158	3
CL-09 Wash Solution 79	01/03/13	20	9360	9.16	3.32	437	32	639	4	2	34	5	17	152	4
CL-09 Wash Solution 82	01/06/13	23	9570	10.28	3.46	373	28	651	3	<1	28	3	16	159	3
CL-09 Wash Solution 85	01/09/13	26	9360	11.38	3.72	331	24	657	3	1	24	2	23	173	3
CL-09 Wash Solution 88	01/12/13	29	9400	12.48	3.81	322	25	654	3	<1	25	3	18	162	3
CL-09 Wash Solution 91	01/15/13	32	9040	13.54	4.00	326	26	616	3	2	27	3	18	171	2
CL-09 Wash Solution 94	01/18/13	35	10220	14.73	4.65	304	25	540	1	<1	21	2	20	167	2
CL-09 Wash Solution 97	01/21/13	38	10130	15.92	6.32	284	24	476	<1	<1	18	2	16	164	2

Notes: ml = milliliters; su = standard units; mV = millivolts; mg/l = milligrams per liter; NA = not applicable; NM = not measured

TABLE 7
Column Rinse Test CL-11 Rinsate Analytical Results

Sample ID	Sample Date	Rinse Duration	Cumulative Rinsate Volume Eluted	Rinsate Pore Volumes	pH	ORP	Aluminum, dissolved	Calcium, dissolved	Copper, dissolved	Iron, dissolved	Magnesium, dissolved	Manganese, dissolved	Potassium, dissolved	Sodium, dissolved	Zinc, dissolved
		(days)	(ml)		(su)	(mV)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
CL-11 Wash Solution 60	12/15/12	1	9260	1.06	1.23	429	9,927	617	63	1366	8764	2319	330	244	1214
CL-11 Wash Solution 61	12/16/12	2	10250	2.24	1.47	427	6,155	612	51	908	5798	1516	236	236	781
CL-11 Wash Solution 64	12/19/12	5	10320	3.43	2.48	415	169	629	20	34	202	43	35	213	24
CL-11 Wash Solution 65	12/20/12	6	10010	4.58	2.77	407	77	660	7	11	73	14	24	196	8
CL-11 Wash Solution 68	12/23/12	9	10050	5.73	2.80	402	63	678	10	8	61	10	22	200	6
CL-11 Wash Solution 69	12/24/12	10	10000	6.88	3.03	399	46	678	4	4	37	6	15	200	4
CL-11 Wash Solution 72	12/27/12	13	9700	8.00	3.23	393	50	632	6	4	41	6	22	203	5
CL-11 Wash Solution 73	12/28/12	14	9580	9.10	3.45	422	36	634	2	2	25	3	15	191	2
CL-11 Wash Solution 76	12/31/12	17	9710	10.21	3.57	433	40	649	3	3	28	3	17	219	2
CL-11 Wash Solution 77	01/01/13	18	9310	11.28	3.55	441	34	500	<1	3	19	2	12	197	2
CL-11 Wash Solution 80	01/04/13	21	8810	12.30	4.00	329	76	609	5	16	82	17	80	253	20
CL-11 Wash Solution 81	01/05/13	22	9750	13.42	5.69	292	27	344	<1	2	16	1	11	169	2
CL-11 Wash Solution 84	01/08/13	25	10350	14.61	5.50	320	54	469	<1	2	46	9	15	196	5

Notes: ml = milliliters; su = standard units; mV = millivolts; mg/l = milligrams per liter; NA = not applicable; NM = not measured

TABLE 8
Column Rinse Test CL-12 Rinsate Analytical Results

Sample ID	Sample Date	Rinse Duration	Cumulative Rinsate Volume Eluted	Rinsate Pore Volumes	pH	ORP	Aluminum, dissolved	Calcium, dissolved	Copper, dissolved	Iron, dissolved	Magnesium, dissolved	Manganese, dissolved	Potassium, dissolved	Sodium, dissolved	Zinc, dissolved
		(days)	(ml)		(su)	(mV)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
CL-12 Wash Solution 60	12/15/12	1	8260	0.95	1.55	442	9,940	643	45	787	9273	2481	227	229	1247
CL-12 Wash Solution 61	12/16/12	2	10240	2.13	1.71	437	6,532	607	49	541	6211	1647	173	218	880
CL-12 Wash Solution 66	12/21/12	7	9420	3.21	2.48	402	291	561	46	30	359	84	44	192	46
CL-12 Wash Solution 67	12/22/12	8	9750	4.33	2.81	400	85	629	14	8	93	19	21	181	11
CL-12 Wash Solution 72	12/27/12	13	10250	5.51	3.00	393	72	631	16	9	72	13	20	191	8
CL-12 Wash Solution 73	12/28/12	14	10500	6.71	3.20	413	45	687	7	5	40	6	16	187	4
CL-12 Wash Solution 78	01/02/13	19	10430	7.91	3.42	405	45	623	8	3	40	6	10	185	4
CL-12 Wash Solution 79	01/03/13	20	9680	9.02	3.41	428	39	643	3	3	27	4	12	193	3
CL-12 Wash Solution 84	01/08/13	25	9140	10.07	3.62	340	51	626	6	4	42	7	30	212	6
CL-12 Wash Solution 85	01/09/13	26	8520	11.05	3.78	353	39	500	2	<1	25	3	14	198	3
CL-12 Wash Solution 90	01/14/13	31	9880	12.19	3.82	369	32	510	3	1	29	4	12	182	3
CL-12 Wash Solution 91	01/15/13	32	9780	13.31	4.97	270	30	342	<1	<1	19	2	11	182	2
CL-12 Wash Solution 96	01/20/13	37	9340	14.39	5.09	300	97	456	3	4	90	20	18	190	11
CL-12 Wash Solution 97	01/21/13	38	9960	15.53	6.26	245	29	261	<1	2	13	1	18	180	<1

Notes: ml = milliliters; su = standard units; mV = millivolts; mg/l = milligrams per liter; NA = not applicable; NM = not measured

TABLE 9
Rinse/Rest Core Tray Testing Laboratory Results

			Core Tray 4 - Martin					Core Tray 5 - Upper Abrigo					Core Tray 9 - Middle Abrigo					Core Tray 10 - Lower Abrigo				
Date	Rinse	Rinse Water Source	Rinsate Volume Drained	Cumulative Rinsate Pore Volumes	pH	ORP	Free Acid	Rinsate Volume Drained	Cumulative Rinsate Pore Volumes	pH	ORP	Free Acid	Rinsate Volume Drained	Cumulative Rinsate Pore Volumes	pH	ORP	Free Acid	Rinsate Volume Drained	Cumulative Rinsate Pore Volumes	pH	ORP	Free Acid
	(days)		(liters)	(2.4 liters/PV)	(su)	mV	(grams/liter)	(liters)	(2.8 liters/PV)	(su)	mV	(grams/liter)	(liters)	(2.4 liters/PV)	(su)	mV	(grams/liter)	(liters)	(2.9 liters/PV)	(su)	mV	(grams/liter)
6/11/2015	1	MAG R&D TAP	1.922	0.80	1.51	242	7.62	2.028	0.72	1.54	204	11.68	1.977	0.82	1.44	215	10.97	1.963	0.68	1.35	211	12.28
6/18/2015	8	JC	2.518	1.85	2.15	244	0.47	2.830	1.73	1.69	192	3.05	2.075	1.68	1.28	207	9.62	2.970	1.70	1.62	183	3.52
6/23/2015	13	JC	2.445	2.87	2.71	256	<0.23	2.838	2.74	2.24	229	0.47	2.423	2.69	1.88	241	1.64	2.902	2.70	2.10	199	0.94
6/28/2015	18	JC	1.147	3.35	2.85	221	0.23	1.961	3.44	2.38	215	0.47	1.453	3.30	2.11	223	1.41	1.962	3.38	2.27	185	0.47
7/3/2015	23	JC	0.828	3.69	3.06	223	0.00	1.708	4.05	2.71	264	0.23	1.418	3.89	2.45	274	0.47	1.919	4.04	2.62	170	0.23
7/8/2015	28	JC	1.284	4.23	3.35	162	0.00	1.981	4.76	3.11	151	0.00	0.924	4.28	2.77	130	0.00	0.902	4.35	2.83	169	0.00
7/13/2015	33	JC	0.961	4.63	3.50	104	0.00	1.965	5.46	3.33	53	0.00	1.238	4.79	2.96	60	0.00	0.360	4.48	2.94	140	0.00
7/18/2015	38	Drain*	0.614	4.88	3.66	136	0.00	1.988	6.17	3.62	115	0.00	0.369	4.95	3.19	271	0.00	1.918	5.14	3.11	175	0.00

Notes: ORP = oxidation reduction potential; PV = pore volume; su = standard units; mV = millivolts
* Rinsate was drained from core tray. No rinse water applied.

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TABLE 10
Core Tray CT-08 (Martin) Testing Laboratory Results

Date	Rinse Duration	Rinse Water Source	Rinsate Volume Eluted	Cumulative Pore Volumes Eluted	pH	ORP	Free Acid
	(days)		(l)	(2.5 liter/PV)	(su)	(mV)	(grams/liter)
6/11/2015	1	MAG R&D Tap	1.962	0.78	1.39	250	10.50
6/12/2015	2	MAG R&D Tap	1.230	1.28	1.30	270	8.92
6/13/2015	3	MAG R&D Tap	0.949	1.66	1.59	251	3.75
6/14/2015	4	MAG R&D Tap	1.075	2.09	1.83	250	2.11
6/15/2015	5	MAG R&D Tap	0.940	2.46	2.07	238	0.94
6/16/2015	6	MAG R&D Tap	1.067	2.89	2.24	215	0.23
6/17/2015	7	MAG R&D Tap	1.038	3.30	2.38	216	0.23
6/18/2015	8	JC	1.045	3.72	2.50	232	0.23
6/19/2015	9	JC	1.024	4.13	2.61	242	0.23
6/20/2015	10	JC	0.990	4.53	2.91	235	0.00
6/21/2015	11	JC	1.007	4.93	2.98	249	0.00
6/22/2015	12	JC	0.961	5.32	2.99	229	0.00
6/23/2015	13	JC	0.982	5.71	3.05	232	0.00
6/24/2015	14	JC	0.964	6.09	3.23	230	0.00
6/25/2015	15	JC	0.957	6.48	3.35	215	0.00
6/26/2015	16	JC	0.989	6.87	3.43	212	0.00
6/27/2015	17	JC	1.009	7.28	3.52	189	0.00
6/28/2015	18	JC	1.120	7.72	3.63	220	0.00
6/29/2015	19	JC	1.042	8.14	3.76	164	0.00
6/30/2015	20	JC	1.088	8.58	3.91	142	0.00
7/1/2015	21	JC	1.045	8.99	3.99	131	0.00
7/2/2015	22	JC	1.104	9.44	4.21	78	0.00
7/3/2015	23	JC	1.028	9.85	4.35	102	0.00
7/4/2015	24	JC	1.042	10.26	4.41	57	0.00
7/5/2015	25	JC	1.032	10.68	4.57	51	0.00
7/6/2015	26	JC	0.995	11.07	4.87	32	0.00
7/7/2015	27	JC	1.010	11.48	5.11	2	0.00
7/8/2015	28	JC	1.004	11.88	5.22	0	0.00
7/9/2015	29	JC	1.018	12.29	5.36	-8	0.00
7/10/2015	30	JC	1.011	12.69	5.53	-23	0.00
7/11/2015	31	JC	1.017	13.10	5.67	-35	0.00
7/12/2015	32	JC	1.016	13.50	5.74	-22	0.00
7/13/2015	33	JC	1.012	13.91	5.86	-25	0.00
7/14/2015	34	JC	1.040	14.33	5.88	-22	0.00
7/15/2015	35	JC	0.978	14.72	6.00	-18	0.00
7/16/2015	36	JC	1.008	15.12	6.06	-24	0.00
7/17/2015	37	JC	1.008	15.52	6.18	-21	0.00
7/18/2015	38	JC	1.010	15.93	6.16	-29	0.00
7/18/2015	drain		1.482	16.52	5.84	-45	0.00

Notes: ORP = oxidation reduction potential; PV = pore volume; su = standard units; mV = millivolts
Shaded rows indicates samples were further analyzed.

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TABLE 11
Leached Ore Core Tray CT-08 Rinsate Analytical Results

Sample ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chloride	Chromium	Copper	Fluoride	Iron	Lead	Manganese	Mercury	Nickel	Nitrate/ Nitrite as N	pH	Selenium	Silver	Sulfate as SO_4	Thallium	Total Diss. Solids	Uranium	Zinc
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(su)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
AWQS	NA	0.006	0.005	2	0.004	0.005	NA	0.1	NA	4	NA	0.05	NA	0.002	NA	10	NA	0.05	NA	NA	0.002	NA	NA	NA
CT-08 DAY 116	8,010	NA	NA	0.0614	4.07	4.97	<280	NA	1100	1,790	358	NA	2270	NA	17.9	NA	1.31	NA	NA	101,000	NA	NA	NA	1100
CT-08 DAY 117	6,030	NA	NA	0.0724	3.29	3.76	46.5	NA	803	1,380	239	NA	1710	NA	13.6	NA	1.39	NA	NA	78,700	NA	NA	NA	835
CT-08 DAY 119	2,700	NA	NA	0.0691	1.8	1.69	153	NA	736	798	165	NA	777	NA	6.22	NA	1.71	NA	NA	34,500	NA	NA	NA	387
CT-08 DAY 121	1,400	NA	NA	0.0576	1.07	0.896	425	NA	558	440	67.2	NA	399	NA	3.29	NA	2.14	NA	NA	19,200	NA	NA	NA	201
CT-08 DAY 123	647	NA	NA	0.05	0.589	0.455	107	NA	353	193	17.9	NA	198	NA	1.68	NA	2.45	NA	NA	9,740	NA	NA	NA	108
CT-08 DAY 129	70.7	NA	NA	0.0416	0.134	0.0589	31.7	NA	84.7	78.1	1.21	NA	27.3	NA	0.243	NA	3.28	NA	NA	2,500	NA	NA	NA	16.3
CT-08 DAY 136	9.79	NA	NA	0.0317	0.0634	0.0179	14.1	NA	24.7	21.9	0.135	NA	9.26	NA	0.0837	NA	4.01	NA	NA	1,770	NA	NA	NA	5.52
CT-08 DAY 142	1.8	<0.00019	0.00312	0.0349	0.0341	0.0113	10.4	<0.0004	11.1	12.8	<0.048	0.00852	6.01	<0.00004	0.0614	0.068	5.66	0.0061	0.000411	1,530	<0.000026	2420	0.00966	2.84
CT-08 DAY 144	1.15	0.00064	0.00280	0.0324	0.0257	0.00935	13.8	<0.0004	7.22	13.1	<0.048	0.00614	4.68	0.00004	0.0527	0.168	6.12	0.0051	0.000346	1,590	0.000209	2380	0.00645	2.33
CT-08 DAY 146	0.48	0.00079	0.00348	0.0316	0.0207	0.00797	13.8	<0.0004	6.83	12.6	<0.048	0.00425	5.09	0.00004	0.0469	0.896	6.44	0.0065	0.000307	1,520	0.000199	2350	0.00400	1.94
CT-08 DAY 148	0.17	0.00081	0.00317	0.0347	0.0175	0.00728	12.5	<0.0004	4.83	12.0	<0.048	0.00362	4.62	<0.00004	0.0454	0.067	6.63	0.0066	0.000282	1,510	0.000199	2320	0.00228	1.71

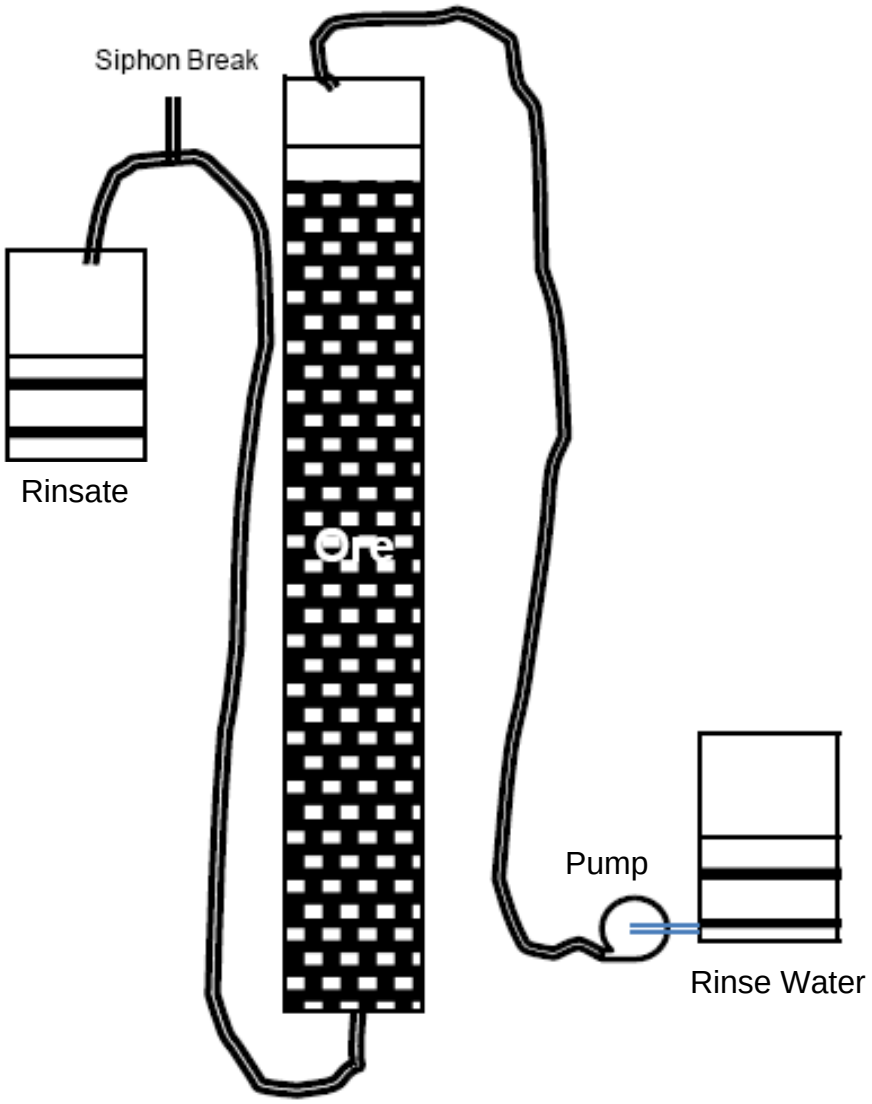
Notes: mg/l = milligrams per liter, su = standard units, AWQS = aquifer water quality standard NA = not applicable

Table 12
Summary of Rinse Analysis

Test ID	Formation	PVs at 50% PLS	PVs at 10% PLS	PVs at 5% PLS	Analytes used	Analytes not used
CL-07	Middle/Upper Abrigo	0.8	2.3	3.0	Al, Fe, Mg, Mn, Zn	Ca, Cu, Na, K
CL-09	Lower Abrigo	1.1	2.2	2.6		
CL-11	Lower Abrigo	1.2	2.2	2.7		
CL-12	Lower Abrigo	1.2	2.2	2.7		
CT-08	Martin	1.4	3.2	3.9	Al, Be, Cd, F, Fe, Mn, Ni, SO_4, Zn	Ba, Cl, Cu
CT-08	Martin	0.4	1.6	2.8	Free Acid	
CT-04	Martin	0.7	2.1	2.1		
CT-05	Upper Abrigo	1.4	2.9	2.7		
CT-09	Middle Abrigo	0.8	2.2	3.6		
CT-10	Lower Abrigo	1.1	2.3	2.8		
Average All		1.0	2.3	2.9		
Standard Deviation All		0.3	0.4	0.5		
Average Analytes		1.1	2.4	3.0		
Standard Deviation Analytes		0.2	0.4	0.5		
Average Free Acid		0.8	2.2	2.8		
Standard Deviation Free Acid		0.4	0.5	0.5		

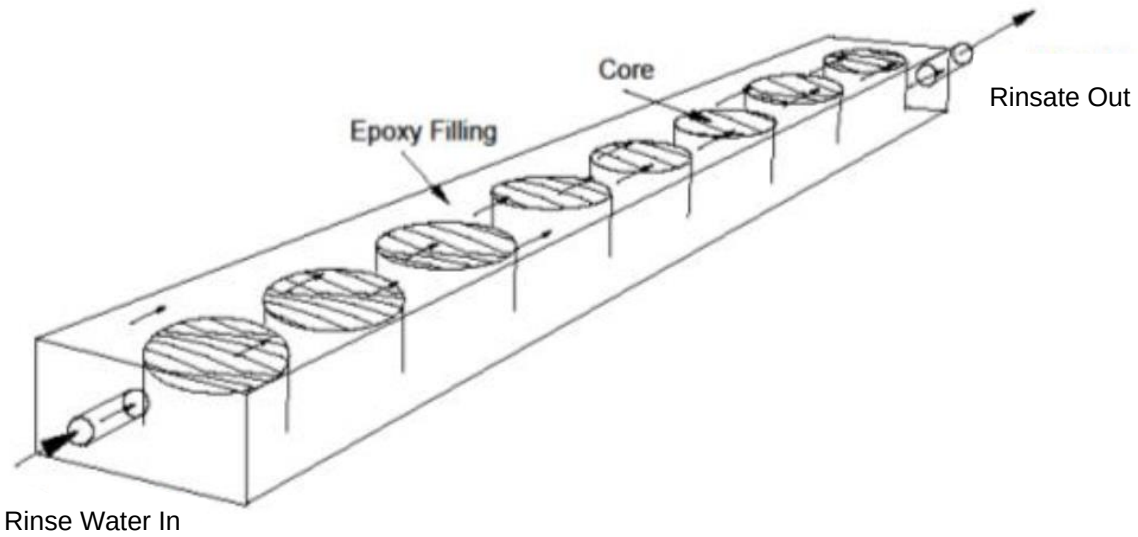
Notes: CL = column test; CT = core tray test; PV = pore volume; PLS = pregnant leach solution

FIGURES



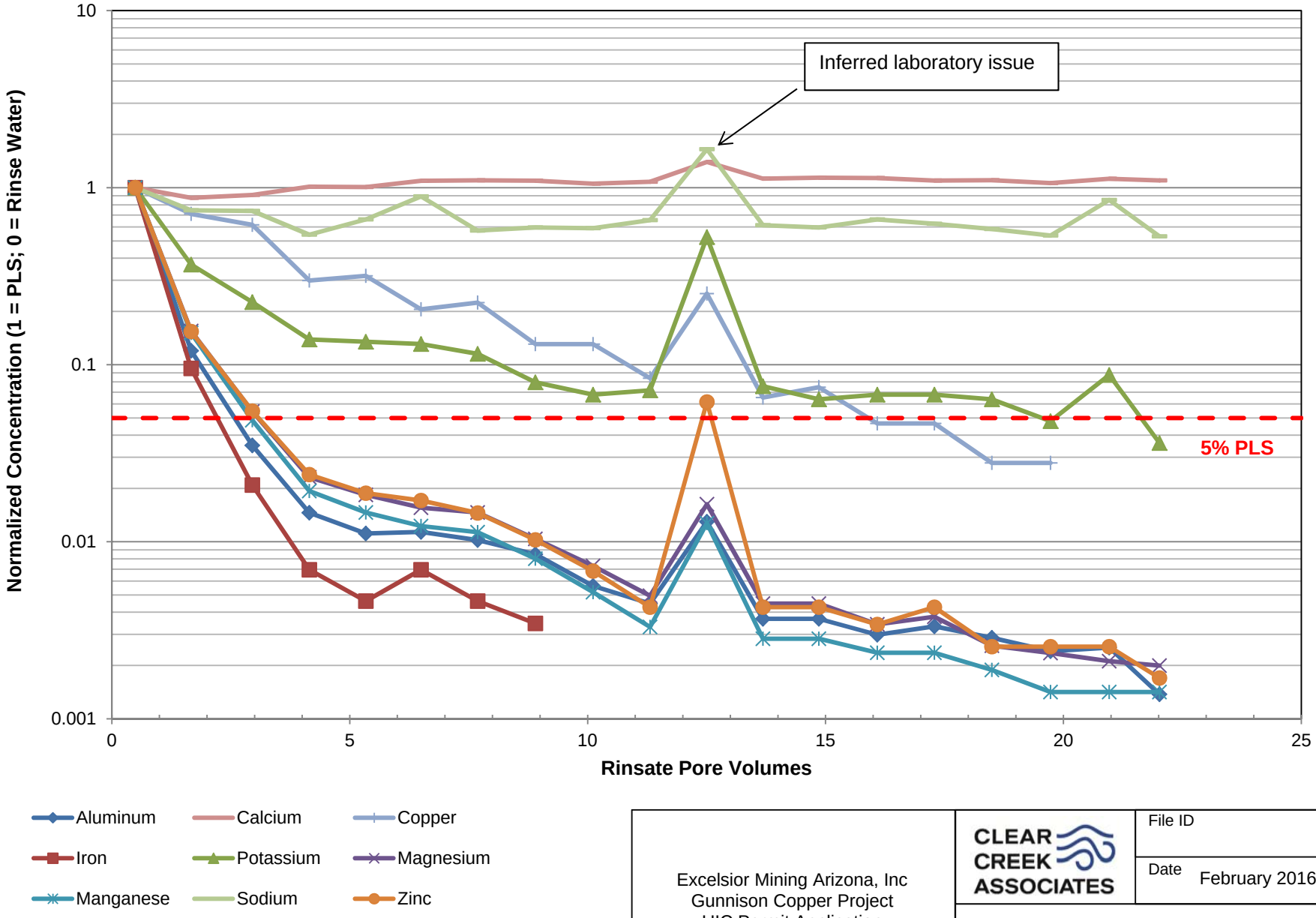
Source: Leach, Inc. Metallurgical Report

Excelsior Mining Arizona, Inc. Gunnison Copper Project UIC Permit Application February 2016	CLEAR CREEK ASSOCIATES	File ID
		Date February 2016
	FIGURE 1 Rinse Column Setup	



Source: Leach, Inc. Metallurgical Report

Excelsior Mining Arizona, Inc. Gunnison Copper Project UIC Permit Application February 2016	CLEAR CREEK ASSOCIATES	File ID Date February 2016
	FIGURE 2 Core Tray Test Setup	



Note: analysis performed by SGS Metcon, PLS = pregnant leach solution

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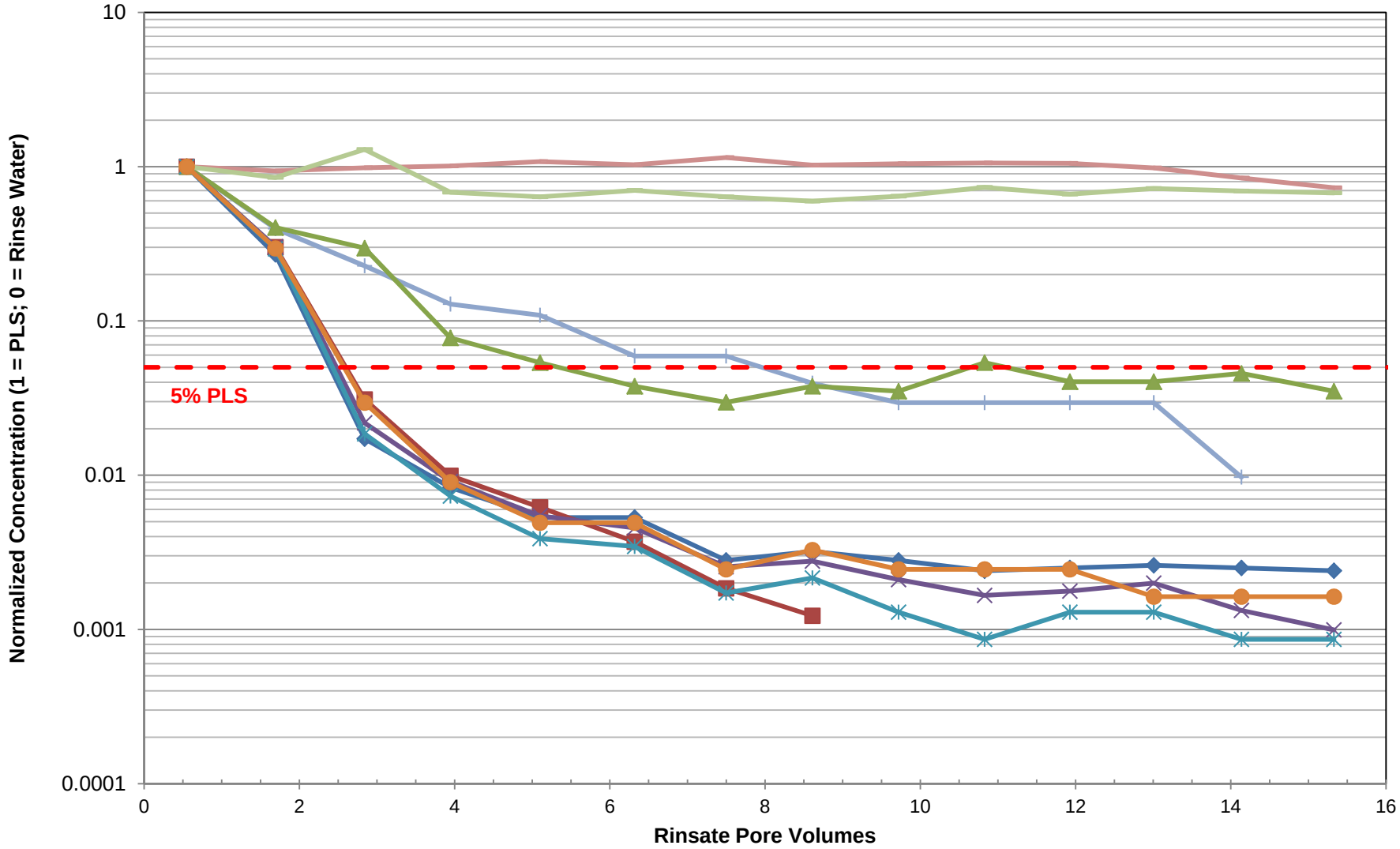
		Date February 2016
	FIGURE 3 Leached Ore Column CL-07 Rinse Test Normalized Concentrations	



Aluminum
Calcium
Copper
Iron
Potassium
Magnesium
Manganese
Sodium
Zinc

Note: analysis performed by SGS Metcon, PLS = pregnant leach solution

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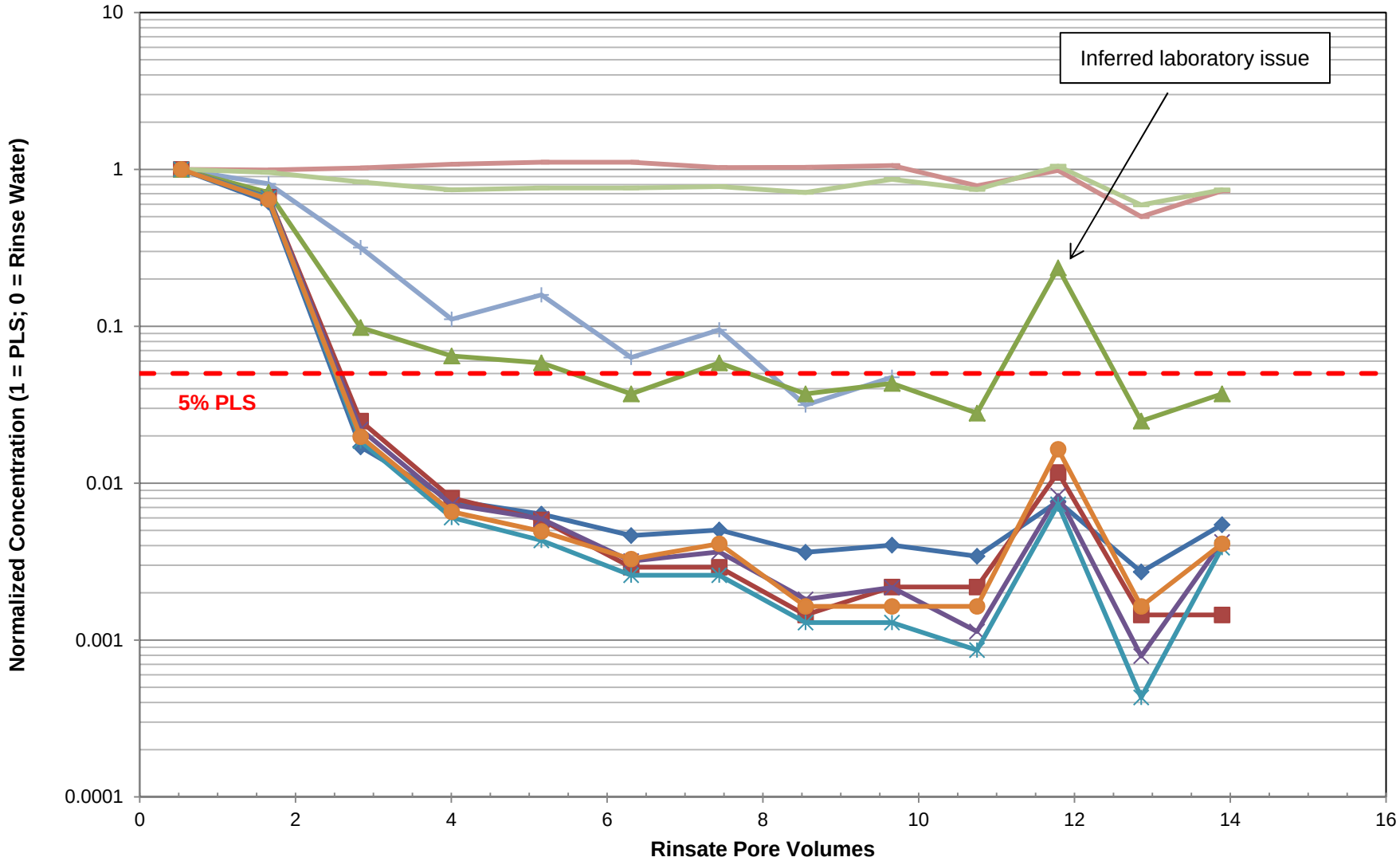
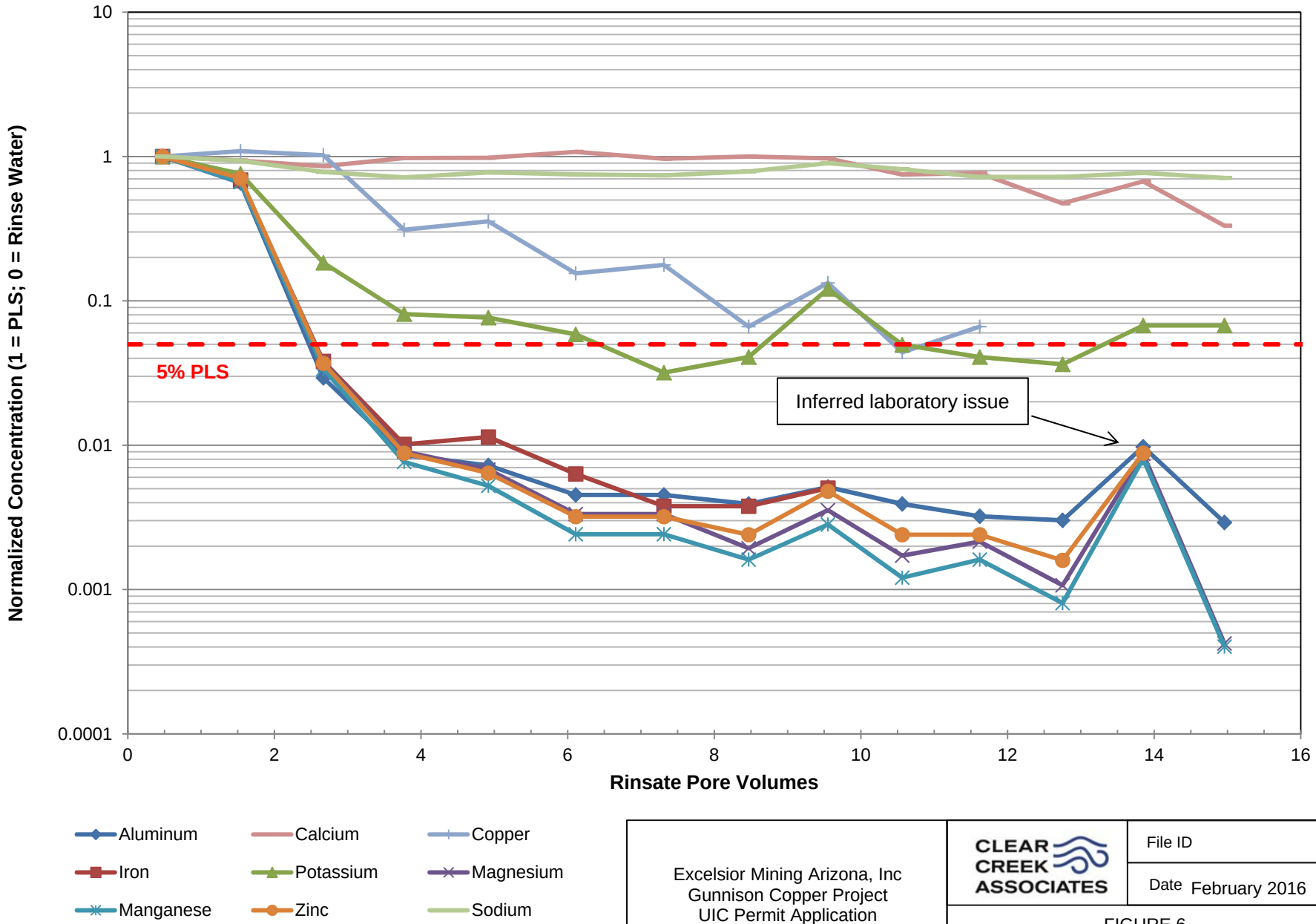
FIGURE 4
Leached Ore Column CL-09 Rinse Test
Normalized Concentrations



Note: analysis performed by SGS Metcon, PLS = pregnant leach solution

Excelsior Mining Arizona, Inc Gunnison Copper Project UIC Permit Application February 2016	CLEAR CREEK ASSOCIATES	File ID Date February 2016
	FIGURE 5 Leached Ore Column CL-11 Rinse Test Normalized Concentrations	



Note: analysis performed by SGS Metcon, PLS = pregnant leach solution

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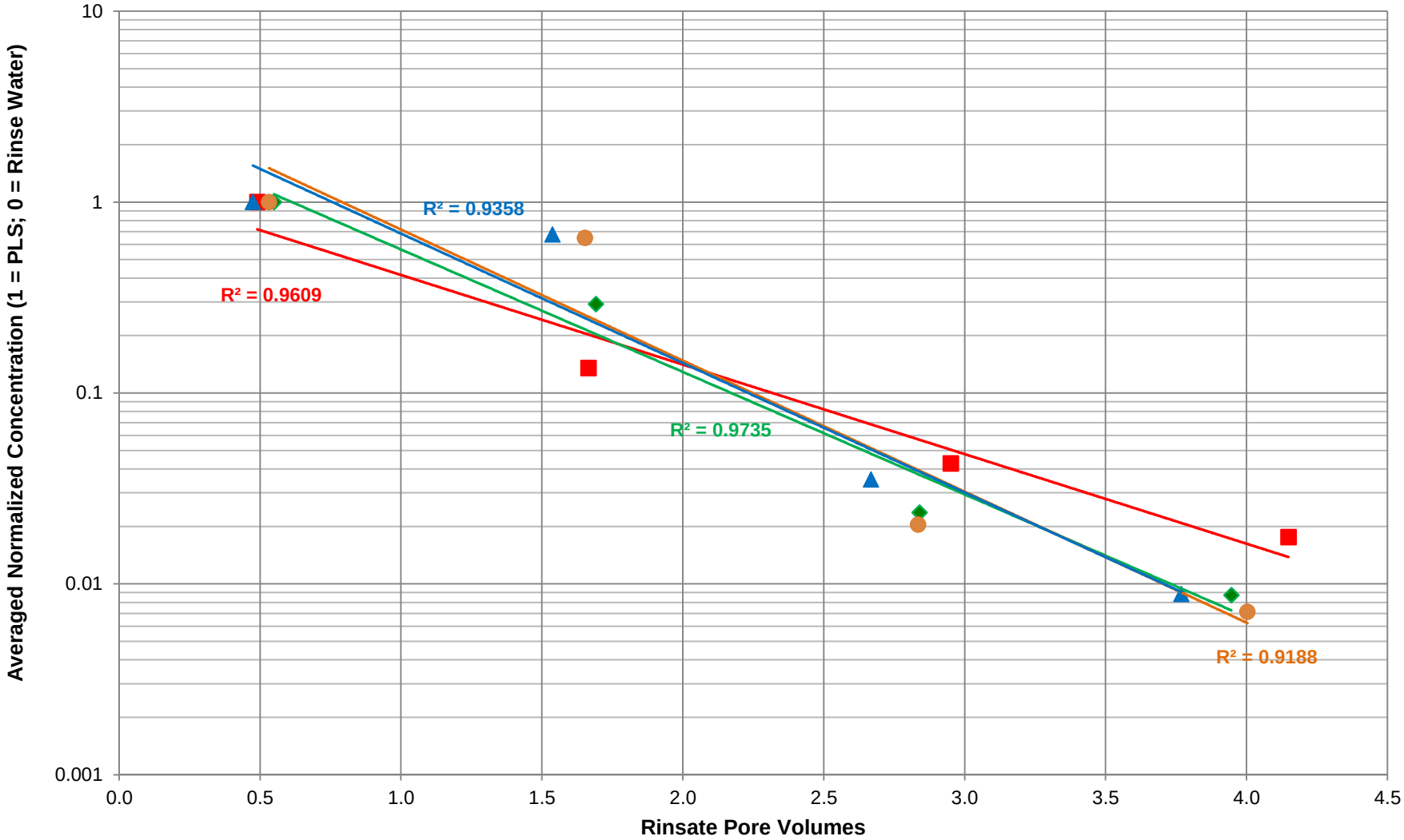
FIGURE 6
Leached Ore Column CL-12 Rinse Test
Normalized Concentrations



CL-07 CL-09 CL-11 CL-12

Note: Averaged normalized concentrations of Al, Fe, Mg, Mn, Zn

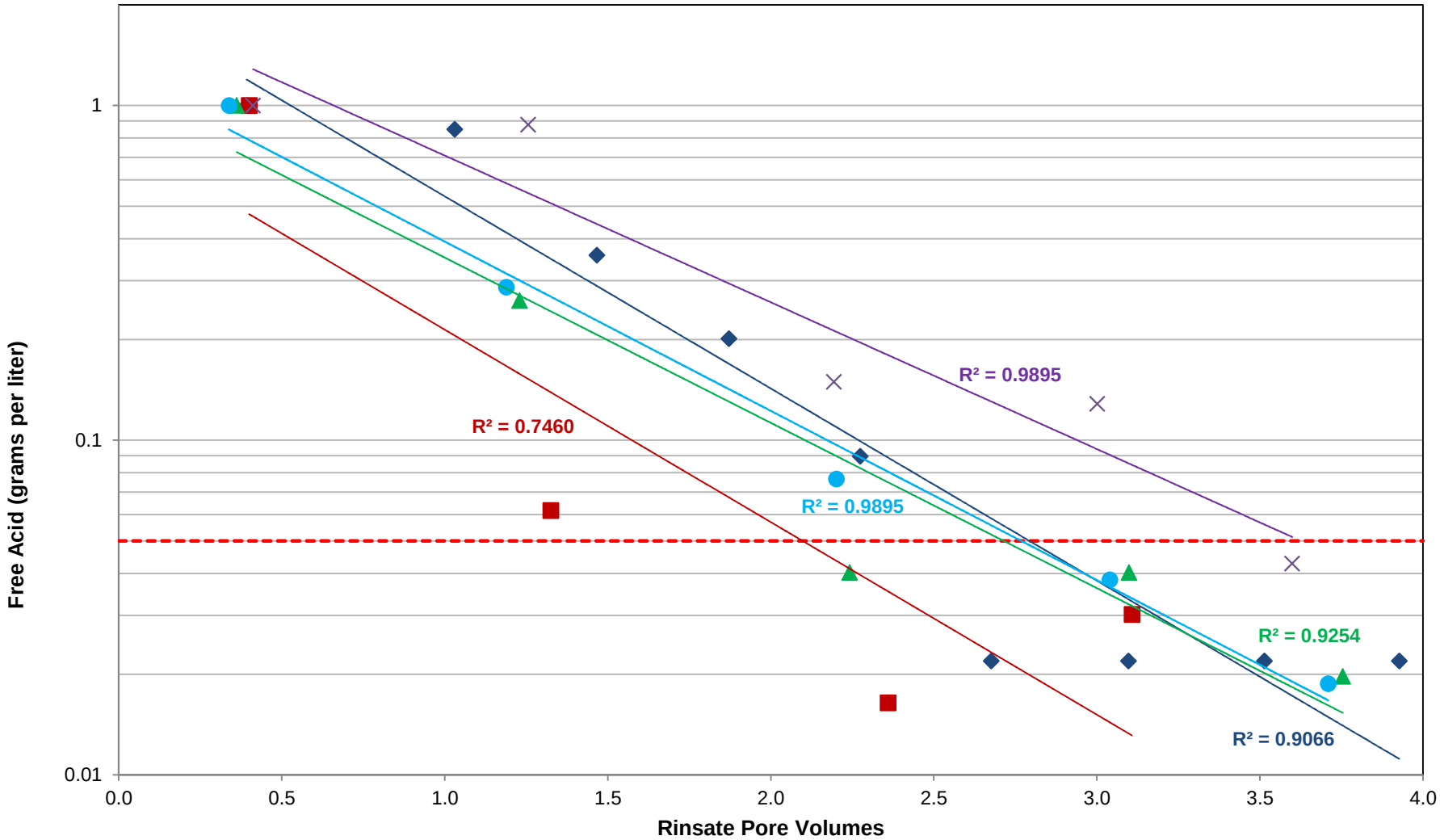
Excelsior Mining Arizona, Inc
Gunnison Copper Project
UIC Permit Application
February 2016

CLEAR CREEK ASSOCIATES

File ID

Date February 2016

FIGURE 7
Leached Ore Column Rinse Test
Averaged Normalized Concentrations



◆ CT-08 Martin
■ CT-04 Martin w/rest
▲ CT-05 Upper Abrigo w/rest
× CT-09 Middle Abrigo w/rest
● CT-10 Lower Abrigo w/rest

Note: data collected by MAG R&D

Excelsior Mining Arizona, Inc
Gunnison Copper Project
UIC Permit Application
January 2016

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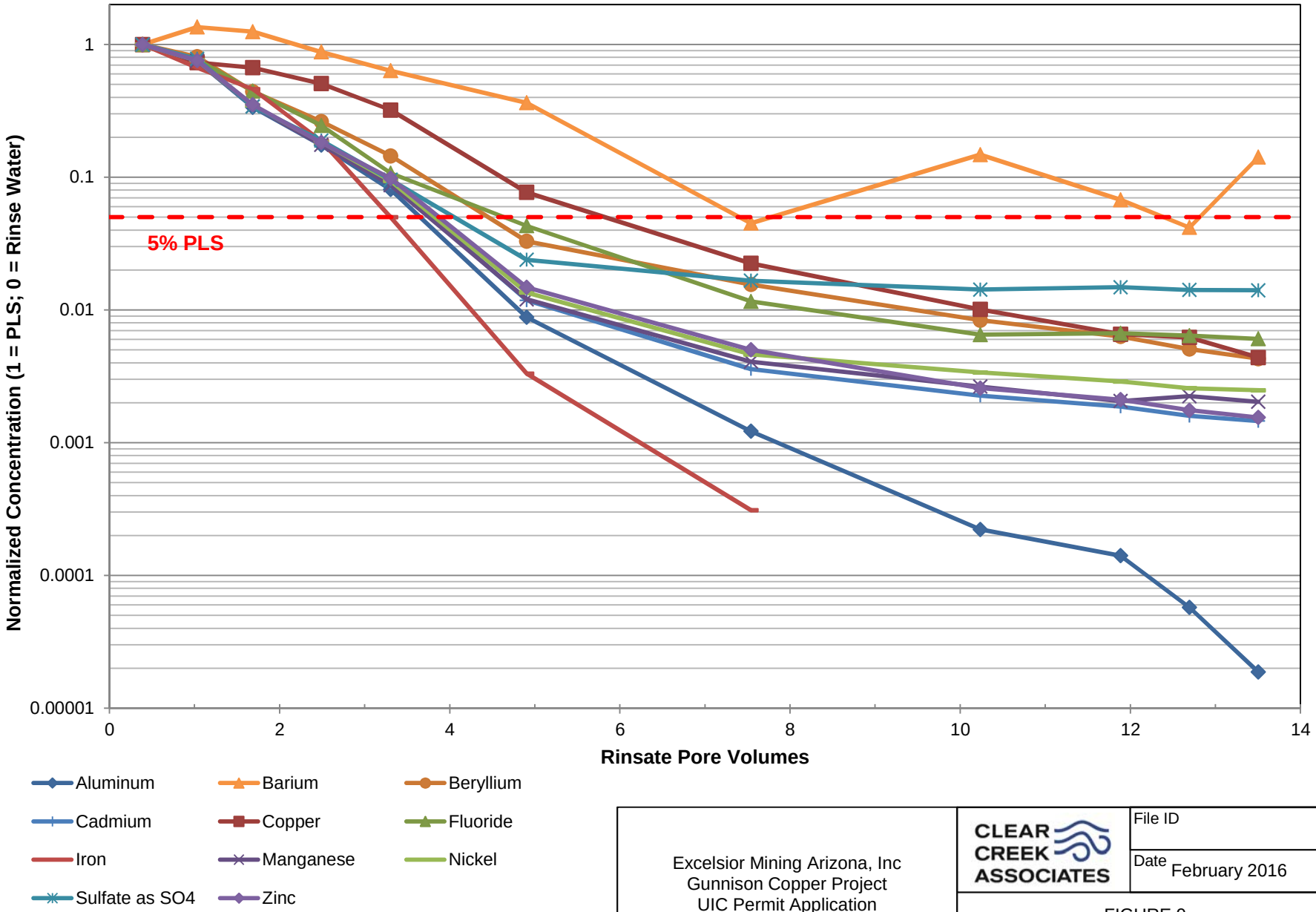
File ID

Date February 2016

FIGURE 8
Leached Ore Core Tray Rinse Tests
Normalized Free Acid Concentrations



Notes: analyses performed by SVL; PLS = pregnant leach solution

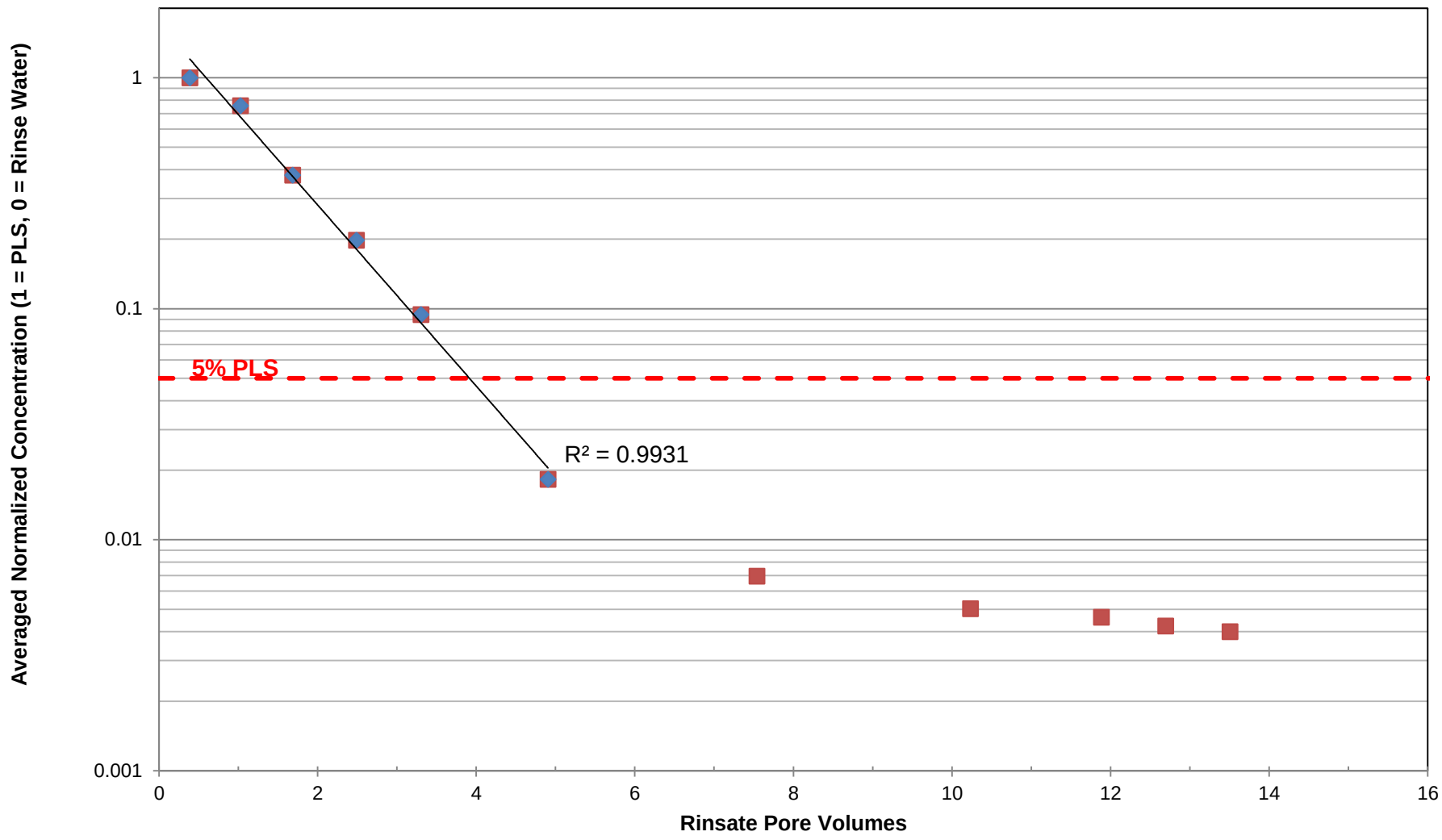
Excelsior Mining Arizona, Inc
Gunnison Copper Project
UIC Permit Application
February 2016

CLEAR CREEK ASSOCIATES

File ID

Date February 2016

FIGURE 9
Leached Ore Core Tray CT-08 Rinse Test
Normalized Concentrations



Note: Averaged normalized concentrations of Al, Bc, Cd, F, Fe, Mn, Ni, SO_4, Zn

Excelsior Mining Arizona, Inc Gunnison Copper Project UIC Permit Application February 2016	CLEAR CREEK ASSOCIATES	File ID Date February 2016
	FIGURE10 Leached Ore Core Tray CT-08 Rinse Test Averaged Normalized Concentrations	

EXHIBIT 1

LABORATORY REPORTS

Certificate of Analysis

SGS Metcon/KD Engineering
7701 N. Business Park Dr.
Tucson, AZ 85743
phone: 520.579.8315
fax: 520.579.7045
www.sgs.com

Excelsior Mining

Metcon Project Number: M817-02
Number of Samples: 78
Print Date: 09.04.13
Service Codes: A0002E30

Assay No.	Description		ICP Analysis														
			Ag	Al	As	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	La	Mg
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
69418	15305	CL-07 Pregnant Solution 95	<1	8708	<1	<1	<1	590	5	24	2	107	860	<1	256	1	8479
69419	15306	CL-07 Pregnant Solution 96	<1	1044	<1	<1	<1	526	<1	4	<1	76	82	<1	96	<1	1321
69420	15308	CL-07 Pregnant Solution 98	<1	305	<1	<1	<1	543	<1	1	<1	66	18	<1	60	<1	470
69421	15309	CL-07 Pregnant Solution 99	<1	127	<1	<1	<1	597	<1	<1	<1	32	6	<1	38	<1	205
69422	15311	CL-07 Pregnant Solution 101	<1	97	<1	<1	<1	594	<1	<1	<1	34	4	<1	37	<1	165
69423	15312	CL-07 Pregnant Solution 102	<1	99	<1	<1	<1	638	<1	<1	<1	22	6	<1	36	<1	141
69424	15314	CL-07 Pregnant Solution 104	<1	89	<1	<1	<1	642	<1	<1	<1	24	4	<1	32	<1	133
69425	15315	CL-07 Pregnant Solution 105	<1	74	<1	<1	<1	639	<1	<1	<1	14	3	<1	23	<1	97
69426	15317	CL-07 Pregnant Solution 107	<1	49	<1	<1	<1	618	<1	<1	<1	14	<1	<1	20	<1	71
69427	15318	CL-07 Pregnant Solution 108	<1	39	<1	<1	<1	631	<1	<1	<1	9	<1	<1	21	<1	51
69428	15320	CL-07 Pregnant Solution 110	<1	113	<1	<1	<1	796	<1	<1	<1	27	27	<1	136	<1	147
69429	15321	CL-07 Pregnant Solution 111	<1	32	<1	<1	<1	655	<1	<1	<1	7	<1	<1	22	<1	47
69430	15323	CL-07 Pregnant Solution 113	<1	32	<1	<1	<1	662	<1	<1	<1	8	<1	<1	19	<1	47
69431	15324	CL-07 Pregnant Solution 114	<1	26	<1	<1	<1	659	<1	<1	<1	5	1	<1	20	<1	38
69432	15326	CL-07 Pregnant Solution 116	<1	29	<1	<1	<1	640	<1	<1	<1	5	<1	<1	20	<1	41
69433	15327	CL-07 Pregnant Solution 117	<1	25	<1	<1	<1	643	<1	<1	<1	3	<1	<1	19	<1	31
69434	15329	CL-07 Pregnant Solution 119	<1	21	<1	<1	<1	622	<1	<1	<1	3	<1	<1	15	<1	29
		Method	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
		Minimum Detection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

REGISTERED ASSAYER CERTIFICATE NO. 52458 MANUEL J. VIDAL DATE SIGNED 09/05/13 ARIZONA U.S.A.

Exp. 06/30/2014

Signature: _____

Certificate of Analysis

Assay No.	Description		ICP Analysis														
			Mn	Mo	Na	Ni	P	Pb	Sb	Sc	Sr	Ti	Tl	V	W	Zn	Zr
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
69418	15305	CL-07 Pregnant Solution 95	2119	1	228	20	429	<1	<1	<1	3	4	3	<1	13	1169	<1
69419	15306	CL-07 Pregnant Solution 96	320	<1	185	3	55	<1	<1	<1	2	<1	<1	<1	2	180	<1
69420	15308	CL-07 Pregnant Solution 98	103	<1	184	1	17	<1	<1	<1	<1	<1	<1	<1	<1	64	<1
69421	15309	CL-07 Pregnant Solution 99	41	<1	151	7	8	<1	<1	<1	2	<1	<1	<1	<1	28	<1
69422	15311	CL-07 Pregnant Solution 101	31	<1	171	<1	5	<1	<1	<1	2	<1	<1	<1	<1	22	<1
69423	15312	CL-07 Pregnant Solution 102	26	<1	210	<1	3	<1	<1	<1	2	<1	<1	<1	<1	20	<1
69424	15314	CL-07 Pregnant Solution 104	24	<1	156	<1	3	<1	<1	<1	2	<1	<1	<1	<1	17	<1
69425	15315	CL-07 Pregnant Solution 105	17	<1	160	<1	2	<1	<1	<1	3	<1	<1	<1	<1	12	<1
69426	15317	CL-07 Pregnant Solution 107	11	<1	159	<1	3	<1	<1	<1	1	<1	<1	<1	<1	8	<1
69427	15318	CL-07 Pregnant Solution 108	7	<1	170	<1	3	<1	<1	<1	2	<1	<1	<1	<1	5	<1
69428	15320	CL-07 Pregnant Solution 110	27	<1	337	3	11	4	<1	<1	2	<1	<1	<1	<1	72	<1
69429	15321	CL-07 Pregnant Solution 111	6	<1	163	<1	1	<1	<1	<1	1	<1	<1	<1	<1	5	<1
69430	15323	CL-07 Pregnant Solution 113	6	<1	160	<1	2	<1	<1	<1	2	<1	<1	<1	<1	5	<1
69431	15324	CL-07 Pregnant Solution 114	5	<1	171	<1	3	<1	<1	<1	2	<1	<1	<1	<1	4	<1
69432	15326	CL-07 Pregnant Solution 116	5	<1	165	<1	3	<1	<1	<1	2	<1	<1	<1	<1	5	<1
69433	15327	CL-07 Pregnant Solution 117	4	<1	158	<1	3	<1	<1	<1	2	<1	<1	<1	<1	3	<1
69434	15329	CL-07 Pregnant Solution 119	3	<1	150	<1	1	<1	<1	<1	2	<1	<1	<1	<1	3	<1
	Method		ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
	Minimum Detection		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

REGISTERED ASSAYER
CERTIFICATE NO.
52458
MANUEL J.
VIDAL
DATE SIGNED
ARIZONA U.S.A.

Signature: _____

Exp. 06/30/2014

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Certificate of Analysis

Assay No.	Description		ICP Analysis														
			Ag	Al	As	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	La	Mg
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
69435	15330	CL-07 Pregnant Solution 120	<1	22	<1	<1	<1	654	<1	<1	<1	<1	2	<1	25	<1	27
69436	16651	CL-07 Pregnant Solution 121	<1	12	<1	<1	<1	641	<1	<1	<1	<1	<1	<1	12	<1	26
69437	13110	CL-09 Pregnant Solution 60	<1	9979	<1	<1	<1	626	5	27	3	101	1612	<1	378	<1	8993
69438	13711	CL-09 Pregnant Solution 61	<1	2694	<1	<1	<1	592	1	8	<1	40	485	<1	154	<1	2726
69439	13714	CL-09 Pregnant Solution 64	<1	172	<1	<1	<1	617	<1	<1	<1	23	50	<1	114	<1	205
69440	13717	CL-09 Pregnant Solution 67	<1	83	<1	<1	<1	631	<1	<1	<1	13	16	<1	32	<1	91
69441	13720	CL-09 Pregnant Solution 70	<1	53	<1	<1	<1	670	<1	<1	<1	11	10	<1	23	<1	58
69442	13723	CL-09 Pregnant Solution 73	<1	53	<1	<1	<1	642	<1	<1	<1	6	6	<1	17	<1	50
69443	13726	CL-09 Pregnant Solution 76	<1	28	<1	<1	<1	707	<1	<1	<1	6	3	<1	14	<1	32
69444	13729	CL-09 Pregnant Solution 79	<1	32	<1	<1	<1	639	<1	<1	<1	4	2	<1	17	<1	34
69445	13732	CL-09 Pregnant Solution 82	<1	28	<1	<1	<1	651	<1	<1	<1	3	<1	<1	16	<1	28
69446	13735	CL-09 Pregnant Solution 85	<1	24	<1	<1	<1	657	<1	<1	<1	3	1	<1	23	<1	24
69447	13738	CL-09 Pregnant Solution 88	<1	25	<1	<1	<1	654	<1	<1	<1	3	<1	<1	18	<1	25
69448	15361	CL-09 Pregnant Solution 91	<1	26	<1	<1	<1	616	<1	<1	<1	3	2	<1	18	<1	27
69449	15364	CL-09 Pregnant Solution 94	<1	25	<1	<1	<1	540	<1	<1	<1	1	<1	<1	20	<1	21
69450	15367	CL-09 Pregnant Solution 97	<1	24	<1	<1	<1	476	<1	<1	<1	<1	<1	<1	16	<1	18
69451	13127	CL-10 Pregnant Solution 47	<1	8139	<1	<1	<1	651	4	23	2	71	889	<1	245	<1	7771
69452	13128	CL-10 Pregnant Solution 48	<1	301	<1	<1	<1	561	<1	<1	<1	10	32	<1	38	<1	321
69453	13129	CL-10 Pregnant Solution 49	<1	488	<1	<1	<1	547	<1	1	<1	14	51	<1	32	<1	486
69454	13130	CL-10 Pregnant Solution 50	<1	53	<1	<1	<1	588	<1	<1	<1	5	5	<1	17	<1	57
69455	13131	CL-10 Pregnant Solution 51	<1	57	<1	<1	<1	508	<1	<1	<1	5	3	<1	10	<1	35
69456	13132	CL-10 Pregnant Solution 52	<1	45	<1	<1	<1	386	<1	<1	<1	4	3	<1	13	<1	26
69457	13742	CL-10 Pregnant Solution 62	<1	50	<1	<1	<1	340	<1	<1	<1	5	8	<1	18	<1	40
		Method	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
		Minimum Detection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

REGISTERED ASSAYER
CERTIFICATE NO.
52458
MANUEL J. VIDAL
DATE SIGNED 02/05/12
ARIZONA U.S.A.

Signature: _____

Exp. 06/30/2014

Certificate of Analysis

Assay No.	Description	ICP Analysis														
		Mn	Mo	Na	Ni	P	Pb	Sb	Sc	Sr	Ti	Tl	V	W	Zn	Zr
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
69435	15330 CL-07 Pregnant Solution 120	3	<1	203	<1	2	<1	<1	<1	2	<1	<1	<1	<1	3	<1
69436	16651 CL-07 Pregnant Solution 121	3	<1	149	<1	2	<1	<1	<1	1	<1	<1	<1	<1	2	<1
69437	13110 CL-09 Pregnant Solution 60	2320	4	214	22	245	2	<1	<1	2	21	3	1	14	1219	<1
69438	13711 CL-09 Pregnant Solution 61	680	1	191	7	66	<1	<1	<1	2	5	<1	<1	4	360	<1
69439	13714 CL-09 Pregnant Solution 64	43	<1	259	1	7	1	<1	<1	2	<1	<1	<1	<1	36	<1
69440	13717 CL-09 Pregnant Solution 67	17	<1	165	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	11	<1
69441	13720 CL-09 Pregnant Solution 70	9	<1	158	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	6	<1
69442	13723 CL-09 Pregnant Solution 73	8	<1	168	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	6	<1
69443	13726 CL-09 Pregnant Solution 76	4	<1	158	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	3	<1
69444	13729 CL-09 Pregnant Solution 79	5	<1	152	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	4	<1
69445	13732 CL-09 Pregnant Solution 82	3	<1	159	<1	2	<1	<1	<1	3	<1	<1	<1	<1	3	<1
69446	13735 CL-09 Pregnant Solution 85	2	<1	173	<1	1	<1	<1	<1	3	<1	<1	<1	<1	3	<1
69447	13738 CL-09 Pregnant Solution 88	3	<1	162	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	3	<1
69448	15361 CL-09 Pregnant Solution 91	3	<1	171	<1	1	<1	<1	<1	3	<1	<1	<1	<1	2	<1
69449	15364 CL-09 Pregnant Solution 94	2	<1	167	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	2	<1
69450	15367 CL-09 Pregnant Solution 97	2	<1	164	<1	2	<1	<1	<1	2	<1	<1	<1	<1	2	<1
69451	13127 CL-10 Pregnant Solution 47	2015	10	226	19	183	2	<1	<1	2	8	2	<1	12	1088	<1
69452	13128 CL-10 Pregnant Solution 48	79	<1	177	<1	7	<1	<1	<1	2	<1	<1	<1	<1	47	<1
69453	13129 CL-10 Pregnant Solution 49	123	<1	167	1	10	<1	<1	<1	3	<1	<1	<1	<1	71	<1
69454	13130 CL-10 Pregnant Solution 50	11	<1	151	<1	2	<1	<1	<1	3	<1	<1	<1	<1	7	<1
69455	13131 CL-10 Pregnant Solution 51	5	<1	209	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	4	<1
69456	13132 CL-10 Pregnant Solution 52	3	<1	213	<1	1	<1	<1	<1	1	<1	<1	<1	<1	3	<1
69457	13742 CL-10 Pregnant Solution 62	6	<1	220	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	5	<1
	Method	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
	Minimum Reception	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

REGISTERED ASSAYER
CERTIFICATE NO.
52458
MANUEL J.
VIDAL
DATE SIGNED 09/05/23
ARIZONA U.S.A.

Signature: _____

Exp. 06/30/24

SGS

Certificate of Analysis

Assay No.	Description		ICP Analysis														
			Ag	Al	As	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	La	Mg
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
69458	13747	CL-10 Pregnant Solution 67	<1	35	<1	<1	<1	263	<1	<1	<1	3	2	<1	20	<1	24
69459	13752	CL-10 Pregnant Solution 72	<1	32	<1	<1	<1	219	<1	<1	<1	1	1	<1	16	<1	21
69460	13757	CL-10 Pregnant Solution 77	<1	39	<1	<1	<1	235	<1	<1	<1	2	1	<1	16	<1	29
69461	13758	CL-10 Pregnant Solution 78	<1	51	<1	<1	<1	545	<1	<1	<1	3	8	<1	66	<1	57
69462	13170	CL-11 Pregnant Solution 60	<1	9927	1	<1	<1	617	5	27	3	63	1366	<1	330	<1	8764
69463	13771	CL-11 Pregnant Solution 61	<1	6155	<1	<1	<1	612	3	17	2	51	908	<1	236	<1	5798
69464	13774	CL-11 Pregnant Solution 64	<1	169	<1	<1	<1	629	<1	<1	<1	20	34	<1	35	<1	202
69465	13775	CL-11 Pregnant Solution 65	<1	77	<1	<1	<1	660	<1	<1	<1	7	11	<1	24	<1	73
69466	13778	CL-11 Pregnant Solution 68	<1	63	<1	<1	<1	678	<1	<1	<1	10	8	<1	22	<1	61
69467	13779	CL-11 Pregnant Solution 69	<1	46	<1	<1	<1	678	<1	<1	<1	4	4	<1	15	<1	37
69468	13782	CL-11 Pregnant Solution 72	<1	50	<1	<1	<1	632	<1	<1	<1	6	4	<1	22	<1	41
69469	13783	CL-11 Pregnant Solution 73	<1	36	<1	<1	<1	634	<1	<1	<1	2	2	<1	15	<1	25
69470	13786	CL-11 Pregnant Solution 76	<1	40	<1	<1	<1	649	<1	<1	<1	3	3	<1	17	<1	28
69471	13787	CL-11 Pregnant Solution 77	<1	34	<1	<1	<1	500	<1	<1	<1	<1	3	<1	12	<1	19
69472	13790	CL-11 Pregnant Solution 80	<1	76	<1	<1	<1	609	<1	<1	<1	5	16	<1	80	<1	82
69473	13791	CL-11 Pregnant Solution 81	<1	27	<1	<1	<1	344	<1	<1	<1	<1	2	<1	11	<1	16
69474	13794	CL-11 Pregnant Solution 84	<1	54	<1	<1	<1	469	<1	<1	<1	<1	2	<1	15	<1	46
69475	13200	CL-12 Pregnant Solution 60	<1	9940	<1	<1	<1	643	5	28	2	45	787	<1	227	<1	9273
69476	13801	CL-12 Pregnant Solution 61	<1	6532	<1	<1	<1	607	4	19	2	49	541	<1	173	<1	6211
69477	13806	CL-12 Pregnant Solution 66	<1	291	<1	<1	<1	561	<1	1	<1	46	30	<1	44	<1	359
69478	13807	CL-12 Pregnant Solution 67	<1	85	<1	<1	<1	629	<1	<1	<1	14	8	<1	21	<1	93
69479	13812	CL-12 Pregnant Solution 72	<1	72	<1	<1	<1	631	<1	<1	<1	16	9	<1	20	<1	72
69480	13813	CL-12 Pregnant Solution 73	<1	45	<1	<1	<1	687	<1	<1	<1	7	5	<1	16	<1	40
		Method	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
		Minimum Detection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

REGISTERED ASSAYER CERTIFICATE NO. 52458 MANUEL J. VIDAL DATE SIGNED 9/04/14 ARIZONA U.S.A.

Exp. 06/30/2014

Signature: _____

SGS

Certificate of Analysis

Assay No.	Description		ICP Analysis														
			Mn	Mo	Na	Ni	P	Pb	Sb	Sc	Sr	Ti	Tl	V	W	Zn	Zr
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
69458	13747	CL-10 Pregnant Solution 67	3	<1	208	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1
69459	13752	CL-10 Pregnant Solution 72	2	<1	199	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1
69460	13757	CL-10 Pregnant Solution 77	4	<1	204	<1	1	<1	<1	<1	2	<1	<1	<1	<1	4	<1
69461	13758	CL-10 Pregnant Solution 78	9	<1	269	<1	4	<1	<1	<1	3	<1	<1	<1	<1	11	<1
69462	13170	CL-11 Pregnant Solution 60	2319	2	244	22	238	1	<1	<1	3	16	2	1	14	1214	1
69463	13771	CL-11 Pregnant Solution 61	1516	1	236	14	149	<1	<1	<1	2	10	2	<1	9	781	1
69464	13774	CL-11 Pregnant Solution 64	43	<1	213	<1	3	<1	<1	<1	2	<1	<1	<1	<1	24	<1
69465	13775	CL-11 Pregnant Solution 65	14	<1	196	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	8	<1
69466	13778	CL-11 Pregnant Solution 68	10	<1	200	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	6	<1
69467	13779	CL-11 Pregnant Solution 69	6	<1	200	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	4	<1
69468	13782	CL-11 Pregnant Solution 72	6	<1	203	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	5	<1
69469	13783	CL-11 Pregnant Solution 73	3	<1	191	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	2	<1
69470	13786	CL-11 Pregnant Solution 76	3	<1	219	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	2	<1
69471	13787	CL-11 Pregnant Solution 77	2	<1	197	<1	1	<1	<1	<1	1	<1	<1	<1	<1	2	<1
69472	13790	CL-11 Pregnant Solution 80	17	<1	253	<1	6	<1	<1	<1	2	<1	<1	<1	<1	20	<1
69473	13791	CL-11 Pregnant Solution 81	1	<1	169	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	2	<1
69474	13794	CL-11 Pregnant Solution 84	9	<1	196	<1	1	<1	<1	<1	1	<1	<1	<1	<1	5	<1
69475	13200	CL-12 Pregnant Solution 60	2481	2	229	23	237	<1	<1	<1	2	5	3	<1	14	1247	1
69476	13801	CL-12 Pregnant Solution 61	1647	1	218	16	162	<1	<1	<1	1	3	2	<1	10	880	1
69477	13806	CL-12 Pregnant Solution 66	84	<1	192	<1	3	<1	<1	<1	2	<1	<1	<1	<1	46	<1
69478	13807	CL-12 Pregnant Solution 67	19	<1	181	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	11	<1
69479	13812	CL-12 Pregnant Solution 72	13	<1	191	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	8	<1
69480	13813	CL-12 Pregnant Solution 73	6	<1	187	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	4	<1
		Method	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
		Minimum Detection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

REGISTERED ASSAYER
CERTIFICATE NO. 52458
MANUEL J. VIDAL
DATE SIGNED
ARIZONA U.S.A.

Signature: Exp. 06/30/2014

Certificate of Analysis

Assay No.	Description		ICP Analysis														
			Ag	Al	As	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	La	Mg
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
69481	13818	CL-12 Pregnant Solution 78	<1	45	<1	<1	<1	623	<1	<1	<1	8	3	<1	10	<1	40
69482	13819	CL-12 Pregnant Solution 79	<1	39	<1	<1	<1	643	<1	<1	<1	3	3	<1	12	<1	27
69483	13824	CL-12 Pregnant Solution 84	<1	51	<1	<1	<1	626	<1	<1	<1	6	4	<1	30	<1	42
69484	13825	CL-12 Pregnant Solution 85	<1	39	<1	<1	<1	500	<1	<1	<1	2	<1	<1	14	<1	25
69485	13830	CL-12 Pregnant Solution 90	<1	32	<1	<1	<1	510	<1	<1	<1	3	1	<1	12	<1	29
69486	15391	CL-12 Pregnant Solution 91	<1	30	<1	<1	<1	342	<1	<1	<1	<1	<1	<1	11	<1	19
69487	15396	CL-12 Pregnant Solution 96	<1	97	<1	<1	<1	456	<1	<1	<1	3	4	<1	18	<1	90
69488	15397	CL-12 Pregnant Solution 97	<1	29	<1	<1	<1	261	<1	<1	<1	<1	2	<1	18	<1	13
69489	15428	CL-13 Pregnant Solution 98	<1	9605	<1	<1	<1	664	5	26	3	52	1060	<1	258	<1	8397
69490	15430	CL-13 Pregnant Solution 100	<1	6528	<1	1	<1	604	4	19	2	237	898	<1	219	<1	6073
69491	15431	CL-13 Pregnant Solution 101	<1	1106	<1	<1	<1	617	<1	4	<1	60	150	<1	80	<1	1258
69492	17846	CL-08 Pregnant Solution 176	<1	7280	<1	<1	<1	573	4	20	3	94	2412	<1	554	<1	8135
69493	17847	CL-08 Pregnant Solution 177	<1	7400	<1	<1	<1	630	4	20	3	127	2581	<1	592	1	8551
69494	17848	CL-08 Pregnant Solution 178	<1	2165	<1	<1	<1	581	1	7	<1	105	644	<1	301	<1	2977
69495	17849	CL-08 Pregnant Solution 179	<1	424	<1	1	<1	613	<1	1	<1	69	77	<1	140	<1	620
	Duplicate of 69428		<1	114	<1	<1	<1	793	<1	<1	<1	28	29	<1	136	<1	146
	Duplicate of 69439		<1	172	<1	<1	<1	617	<1	<1	<1	23	49	<1	116	<1	205
	Duplicate of 69450		<1	24	<1	<1	<1	473	<1	<1	<1	<1	<1	<1	16	<1	18
	Duplicate of 69461		<1	51	<1	<1	<1	547	<1	<1	<1	4	8	<1	65	<1	57
	Duplicate of 69472		<1	76	<1	<1	<1	608	<1	<1	<1	5	16	<1	80	<1	83
	Duplicate of 69483		<1	50	<1	<1	<1	621	<1	<1	<1	6	4	<1	30	<1	42
	Duplicate of 69495		<1	425	<1	1	<1	613	<1	1	<1	66	72	<1	140	<1	619
	Method		ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
	Minimum Reporting		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

REGISTERED ASSAYER
CERTIFICATE NO.
52458
MANUEL J.
VIDAL
DATE SIGNED
ARIZONA U.S.A.

Signature: _____

Exp. 06/30/2014

SGS

Certificate of Analysis

Assay No.	Description	ICP Analysis														
		Mn	Mo	Na	Ni	P	Pb	Sb	Sc	Sr	Ti	Tl	V	W	Zn	Zr
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
69481	13818 CL-12 Pregnant Solution 78	6	<1	185	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	4	<1
69482	13819 CL-12 Pregnant Solution 79	4	<1	193	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	3	<1
69483	13824 CL-12 Pregnant Solution 84	7	<1	212	<1	1	<1	<1	<1	2	<1	<1	<1	<1	6	<1
69484	13825 CL-12 Pregnant Solution 85	3	<1	198	<1	1	<1	<1	<1	1	<1	<1	<1	<1	3	<1
69485	13830 CL-12 Pregnant Solution 90	4	<1	182	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	3	<1
69486	15391 CL-12 Pregnant Solution 91	2	<1	182	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	2	<1
69487	15396 CL-12 Pregnant Solution 96	20	<1	190	<1	1	<1	<1	<1	2	<1	<1	<1	<1	11	<1
69488	15397 CL-12 Pregnant Solution 97	1	<1	180	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1
69489	15428 CL-13 Pregnant Solution 98	2256	<1	259	22	304	<1	<1	<1	4	7	2	1	14	1165	2
69490	15430 CL-13 Pregnant Solution 100	1601	<1	243	16	232	<1	<1	<1	3	4	2	1	9	845	2
69491	15431 CL-13 Pregnant Solution 101	316	<1	206	3	20	<1	<1	<1	3	<1	<1	<1	2	161	1
69492	17846 CL-08 Pregnant Solution 176	1662	<1	255	15	476	<1	<1	<1	3	16	1	2	11	910	2
69493	17847 CL-08 Pregnant Solution 177	1730	<1	280	16	481	<1	<1	<1	2	17	2	2	11	943	3
69494	17848 CL-08 Pregnant Solution 178	574	<1	214	5	110	<1	<1	<1	2	3	<1	<1	4	320	2
69495	17849 CL-08 Pregnant Solution 179	114	<1	256	1	16	<1	<1	<1	2	<1	<1	<1	<1	78	1
	Duplicate of 69428	26	<1	337	3	10	4	<1	<1	3	<1	<1	<1	<1	71	<1
	Duplicate of 69439	42	<1	258	1	7	1	<1	<1	2	<1	<1	<1	<1	35	<1
	Duplicate of 69450	2	<1	164	<1	2	<1	<1	<1	3	<1	<1	<1	<1	2	<1
	Duplicate of 69461	10	<1	269	<1	4	<1	<1	<1	3	<1	<1	<1	<1	11	<1
	Duplicate of 69472	17	<1	253	<1	6	<1	<1	<1	2	<1	<1	<1	<1	21	<1
	Duplicate of 69483	7	<1	217	<1	1	<1	<1	<1	2	<1	<1	<1	<1	6	<1
	Duplicate of 69495	114	<1	256	1	14	<1	<1	<1	2	<1	<1	<1	<1	78	1
	Method	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
	Minimum Detection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

REGISTERED ASSAYER
CERTIFICATE NO. 52458
MANUEL J. VIDAL
DATE SIGNED 8/16/14
ARIZONA U.S.A.

Signature: Exp. 06/30/2014

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

Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0137**
Reported: 23-Jul-15 15:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received	Notes
CT-08 DAY 142	W5G0137-01	Rinsate	07-Jul-15 15:17	VH	08-Jul-2015	

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.
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

07/23/2015mab: Report reissued. Due to a dilution error, SO4 has been corrected on sample-01

07/13/15 HJG Duplicate RPD exceeded method acceptance limit for SM 4500 H+B.

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0137**
Reported: 23-Jul-15 15:03

Client Sample ID: **CT-08 DAY 142**
SVL Sample ID: **W5G0137-01 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 07-Jul-15 15:17
Received: 08-Jul-15
Sampled By: VH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	1.80	mg/L	0.08	0.04		W528157	AS	07/10/15 10:31	
EPA 200.7	Iron	< 0.048	mg/L	0.060	0.048		W528157	AS	07/10/15 10:31	U
EPA 200.8	**Antimony**	0.00060	mg/L	0.00300	0.00019		W529016	KWH	07/13/15 08:48	J
EPA 200.8	**Arsenic**	0.00312	mg/L	0.00300	0.00027		W529016	KWH	07/13/15 08:48	
EPA 200.8	**Barium**	0.0349	mg/L	0.00100	0.000099		W529016	KWH	07/13/15 08:48	
EPA 200.8	**Beryllium**	0.0341	mg/L	0.00020	0.000048		W529016	KWH	07/13/15 08:48	
EPA 200.8	**Cadmium**	0.0113	mg/L	0.00020	0.000072		W529016	KWH	07/13/15 08:48	
EPA 200.8	**Chromium**	0.0004	mg/L	0.0015	0.0004		W529016	KWH	07/13/15 08:48	J
EPA 200.8	**Copper**	11.1	mg/L	0.0300	0.0150	100	W529016	KWH	07/13/15 09:17	D2,M3
EPA 200.8	**Lead**	0.00852	mg/L	0.00300	0.000031		W529016	KWH	07/13/15 08:48	
EPA 200.8	**Manganese**	6.01	mg/L	0.0100	0.00250	100	W529016	KWH	07/13/15 09:17	D2,M3
EPA 200.8	**Nickel**	0.0614	mg/L	0.0010	0.0004		W529016	KWH	07/13/15 08:48	M2
EPA 200.8	**Selenium**	0.0061	mg/L	0.0030	0.0006		W529016	KWH	07/13/15 08:48	
EPA 200.8	**Silver**	0.000411	mg/L	0.000100	0.000021		W529016	KWH	07/13/15 08:48	
EPA 200.8	**Thallium**	0.000235	mg/L	0.00100	0.000026		W529016	KWH	07/13/15 08:48	J
EPA 200.8	**Uranium**	0.00966	mg/L	0.00100	0.000014		W529016	KWH	07/13/15 08:48	
EPA 200.8	**Zinc**	2.84	mg/L	0.0050	0.0010		W529016	KWH	07/13/15 10:46	M3
Metals (Filtered)										
EPA 245.1	Mercury	< 0.00004	mg/L	0.00020	0.00004		W528237	DB	07/14/15 11:39	U
Classical Chemistry Parameters										
EPA 353.2	**Nitrate/Nitrite as N**	0.068	mg/L	0.050	0.017		W528139	BAG	07/10/15 11:27	M1
SM 2540 C	**Total Diss. Solids**	2420	mg/L	40			W528195	RS	07/10/15 10:55	D1
SM 4500 H B	**pH @16.9°C**	5.66	pH Units				W528151	DKS	07/09/15 07:58	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	10.4	mg/L	1.00	0.28	5	W528182	DJS	07/10/15 12:32	D2
EPA 300.0	**Fluoride**	12.8	mg/L	0.500	0.110	5	W528182	DJS	07/10/15 12:32	D2
EPA 300.0	**Sulfate as SO4**	1530	mg/L	30.0	5.00	100	W528182	DT	07/10/15 15:09	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

SVL holds the following certifications:
AZ:0538, **CA**:2080, **ID**:ID00019 & ID00965 (Microbiology), **NV**:ID000192007A, **UT**(**TNI**):ID000192015-1, **WA**:C573

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

Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0137**
Reported: 23-Jul-15 15:03

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Dissolved)								
EPA 200.7	Aluminum	mg/L	<0.04	0.04	0.08	W528157	10-Jul-15	U
EPA 200.7	Iron	mg/L	<0.048	0.048	0.060	W528157	10-Jul-15	U
EPA 200.8	Antimony	mg/L	<0.00019	0.00019	0.00300	W529016	13-Jul-15	U
EPA 200.8	Arsenic	mg/L	0.00049	0.00027	0.00300	W529016	13-Jul-15	J
EPA 200.8	Barium	mg/L	<0.000099	0.000099	0.00100	W529016	13-Jul-15	U
EPA 200.8	Beryllium	mg/L	<0.000048	0.000048	0.00020	W529016	13-Jul-15	U
EPA 200.8	Cadmium	mg/L	<0.000072	0.000072	0.00020	W529016	13-Jul-15	U
EPA 200.8	Chromium	mg/L	<0.0004	0.0004	0.0015	W529016	13-Jul-15	U
EPA 200.8	Copper	mg/L	<0.00015	0.00015	0.00100	W529016	13-Jul-15	U
EPA 200.8	Lead	mg/L	<0.000031	0.000031	0.00300	W529016	13-Jul-15	U
EPA 200.8	Manganese	mg/L	<0.000025	0.000025	0.00100	W529016	13-Jul-15	U
EPA 200.8	Nickel	mg/L	<0.0004	0.0004	0.0010	W529016	13-Jul-15	U
EPA 200.8	Selenium	mg/L	<0.0006	0.0006	0.0030	W529016	13-Jul-15	U
EPA 200.8	Silver	mg/L	<0.000021	0.000021	0.000100	W529016	13-Jul-15	U
EPA 200.8	Thallium	mg/L	<0.000026	0.000026	0.00100	W529016	13-Jul-15	U
EPA 200.8	Uranium	mg/L	<0.000014	0.000014	0.00100	W529016	13-Jul-15	U
EPA 200.8	Zinc	mg/L	<0.0010	0.0010	0.0050	W529016	13-Jul-15	U
Metals (Filtered)								
EPA 245.1	Mercury	mg/L	<0.00004	0.00004	0.00020	W528237	14-Jul-15	U
Classical Chemistry Parameters								
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.017	0.050	W528139	10-Jul-15	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W528195	10-Jul-15	
Anions by Ion Chromatography								
EPA 300.0	Chloride	mg/L	<0.06	0.06	0.20	W528182	10-Jul-15	U
EPA 300.0	Fluoride	mg/L	<0.022	0.022	0.100	W528182	10-Jul-15	U
EPA 300.0	Sulfate as SO4	mg/L	<0.05	0.05	0.30	W528182	10-Jul-15	U

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	1.00	1.00	100	85 - 115	W528157	10-Jul-15	
EPA 200.7	Iron	mg/L	9.35	10.0	93.5	85 - 115	W528157	10-Jul-15	
EPA 200.8	Antimony	mg/L	0.0253	0.0250	101	85 - 115	W529016	13-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0266	0.0250	106	85 - 115	W529016	13-Jul-15	
EPA 200.8	Barium	mg/L	0.0260	0.0250	104	85 - 115	W529016	13-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0262	0.0250	105	85 - 115	W529016	13-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0270	0.0250	108	85 - 115	W529016	13-Jul-15	
EPA 200.8	Chromium	mg/L	0.0261	0.0250	105	85 - 115	W529016	13-Jul-15	
EPA 200.8	Copper	mg/L	0.0264	0.0250	106	85 - 115	W529016	13-Jul-15	
EPA 200.8	Lead	mg/L	0.0262	0.0250	105	85 - 115	W529016	13-Jul-15	
EPA 200.8	Manganese	mg/L	0.0263	0.0250	105	85 - 115	W529016	13-Jul-15	
EPA 200.8	Nickel	mg/L	0.0260	0.0250	104	85 - 115	W529016	13-Jul-15	
EPA 200.8	Selenium	mg/L	0.0277	0.0250	111	85 - 115	W529016	13-Jul-15	
EPA 200.8	Silver	mg/L	0.0260	0.0250	104	85 - 115	W529016	13-Jul-15	
EPA 200.8	Thallium	mg/L	0.0261	0.0250	104	85 - 115	W529016	13-Jul-15	
EPA 200.8	Uranium	mg/L	0.0262	0.0250	105	85 - 115	W529016	13-Jul-15	
EPA 200.8	Zinc	mg/L	0.0271	0.0250	109	85 - 115	W529016	13-Jul-15	
Metals (Filtered)									
EPA 245.1	Mercury	mg/L	0.00507	0.00500	101	85 - 115	W528237	14-Jul-15	

SVL holds the following certifications:
AZ:0538, **CA**:2080, **ID**:ID00019 & ID00965 (Microbiology), **NV**:ID000192007A, **UT**(**TNI**):ID000192015-1, **WA**:C573

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0137**
Reported: 23-Jul-15 15:03

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Classical Chemistry Parameters									
EPA 353.2	Nitrate/Nitrite as N	mg/L	2.03	2.00	102	90 - 110	W528139	10-Jul-15	
Anions by Ion Chromatography									
EPA 300.0	Chloride	mg/L	2.78	3.00	92.8	90 - 110	W528182	10-Jul-15	
EPA 300.0	Fluoride	mg/L	1.90	2.00	95.0	90 - 110	W528182	10-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	9.67	10.0	96.7	90 - 110	W528182	10-Jul-15	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters									
SM 2540 C	Total Diss. Solids	mg/L	627	633	1.0	10	W528195	10-Jul-15	
SM 4500 H B	pH	pH Units	7.45	7.59	1.9	20	W528151	09-Jul-15	R1

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	mg/L	2.83	1.80	1.00	103	70 - 130	W528157	10-Jul-15	
EPA 200.7	Iron	mg/L	9.46	<0.048	10.0	94.6	70 - 130	W528157	10-Jul-15	
EPA 200.8	Antimony	mg/L	0.0224	0.00060	0.0250	87.3	70 - 130	W529016	13-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0294	0.00312	0.0250	105	70 - 130	W529016	13-Jul-15	
EPA 200.8	Barium	mg/L	0.0596	0.0349	0.0250	98.6	70 - 130	W529016	13-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0549	0.0341	0.0250	83.3	70 - 130	W529016	13-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0340	0.0113	0.0250	91.0	70 - 130	W529016	13-Jul-15	
EPA 200.8	Chromium	mg/L	0.0242	<0.0004	0.0250	96.7	70 - 130	W529016	13-Jul-15	
EPA 200.8	Copper	mg/L	11.4	11.1	0.0250	R > 4S	70 - 130	W529016	13-Jul-15	D2,M3
EPA 200.8	Lead	mg/L	0.0298	0.00852	0.0250	85.2	70 - 130	W529016	13-Jul-15	
EPA 200.8	Manganese	mg/L	6.10	6.01	0.0250	R > 4S	70 - 130	W529016	13-Jul-15	D2,M3
EPA 200.8	Nickel	mg/L	0.0783	0.0614	0.0250	67.9	70 - 130	W529016	13-Jul-15	M2
EPA 200.8	Selenium	mg/L	0.0368	0.0061	0.0250	123	70 - 130	W529016	13-Jul-15	
EPA 200.8	Silver	mg/L	0.0215	0.000411	0.0250	84.4	70 - 130	W529016	13-Jul-15	
EPA 200.8	Thallium	mg/L	0.0226	0.000235	0.0250	89.6	70 - 130	W529016	13-Jul-15	
EPA 200.8	Uranium	mg/L	0.0336	0.00966	0.0250	95.9	70 - 130	W529016	13-Jul-15	
EPA 200.8	Zinc	mg/L	2.50	2.84	0.0250	R > 4S	70 - 130	W529016	13-Jul-15	M3
Metals (Filtered)										
EPA 245.1	Mercury	mg/L	0.00103	<0.00004	0.00100	103	70 - 130	W528237	14-Jul-15	
EPA 245.1	Mercury	mg/L	0.00100	<0.00004	0.00100	100	70 - 130	W528237	14-Jul-15	
Classical Chemistry Parameters										
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.99	<0.050	2.00	99.4	90 - 110	W528139	10-Jul-15	
EPA 353.2	Nitrate/Nitrite as N	mg/L	2.40	0.068	2.00	117	90 - 110	W528139	10-Jul-15	M1
Anions by Ion Chromatography										
EPA 300.0	Chloride	mg/L	3.34	0.37	3.00	99.0	90 - 110	W528182	10-Jul-15	
EPA 300.0	Chloride	mg/L	21.2	41.4	3.00	R > 4S	90 - 110	W528182	10-Jul-15	D2,M3
EPA 300.0	Fluoride	mg/L	2.03	0.233	2.00	90.1	90 - 110	W528182	10-Jul-15	
EPA 300.0	Fluoride	mg/L	1.95	0.276	2.00	83.9	90 - 110	W528182	10-Jul-15	M2
EPA 300.0	Sulfate as SO4	mg/L	17.8	7.44	10.0	104	90 - 110	W528182	10-Jul-15	

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0137**
Reported: 23-Jul-15 15:03

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Anions by Ion Chromatography (Continued)										
EPA 300.0	Sulfate as SO4	mg/L	71.3	142	10.0	R > 4S	90 - 110	W528182	10-Jul-15	D2,M3

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	%R	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Dissolved)											
EPA 200.7	Aluminum	mg/L	2.87	2.83	1.00	107	1.6	20	W528157	10-Jul-15	
EPA 200.7	Iron	mg/L	9.52	9.46	10.0	95.2	0.6	20	W528157	10-Jul-15	
EPA 200.8	Antimony	mg/L	0.0230	0.0224	0.0250	89.4	2.4	20	W529016	13-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0308	0.0294	0.0250	111	4.4	20	W529016	13-Jul-15	
EPA 200.8	Barium	mg/L	0.0620	0.0596	0.0250	108	4.0	20	W529016	13-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0551	0.0549	0.0250	84.3	0.5	20	W529016	13-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0349	0.0340	0.0250	94.3	2.4	20	W529016	13-Jul-15	
EPA 200.8	Chromium	mg/L	0.0244	0.0242	0.0250	97.4	0.8	20	W529016	13-Jul-15	
EPA 200.8	Copper	mg/L	11.5	11.4	0.0250	R > 4S	1.3	20	W529016	13-Jul-15	D2,M3
EPA 200.8	Lead	mg/L	0.0302	0.0298	0.0250	86.6	1.2	20	W529016	13-Jul-15	
EPA 200.8	Manganese	mg/L	6.20	6.10	0.0250	R > 4S	1.7	20	W529016	13-Jul-15	D2,M3
EPA 200.8	Nickel	mg/L	0.0798	0.0783	0.0250	73.8	1.8	20	W529016	13-Jul-15	M2
EPA 200.8	Selenium	mg/L	0.0375	0.0368	0.0250	126	1.8	20	W529016	13-Jul-15	
EPA 200.8	Silver	mg/L	0.0218	0.0215	0.0250	85.4	1.2	20	W529016	13-Jul-15	
EPA 200.8	Thallium	mg/L	0.0232	0.0226	0.0250	91.7	2.3	20	W529016	13-Jul-15	
EPA 200.8	Uranium	mg/L	0.0344	0.0336	0.0250	99.1	2.3	20	W529016	13-Jul-15	
EPA 200.8	Zinc	mg/L	2.42	2.50	0.0250	R > 4S	3.2	20	W529016	13-Jul-15	M3
Metals (Filtered)											
EPA 245.1	Mercury	mg/L	0.00102	0.00103	0.00100	102	1.0	20	W528237	14-Jul-15	
Classical Chemistry Parameters											
EPA 353.2	Nitrate/Nitrite as N	mg/L	1.94	1.99	2.00	97.0	2.5	20	W528139	10-Jul-15	
Anions by Ion Chromatography											
EPA 300.0	Chloride	mg/L	3.39	3.34	3.00	101	1.5	20	W528182	10-Jul-15	
EPA 300.0	Fluoride	mg/L	2.06	2.03	2.00	91.6	1.5	20	W528182	10-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	18.0	17.8	10.0	105	0.8	20	W528182	10-Jul-15	

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Excelsior Mining Corp.	**Project Name: Gunnison Copper 2015**
2999 N. 44th St. #300	Work Order: **W5G0137**
Phoenix, AZ 85018	Reported: 23-Jul-15 15:03

Notes and Definitions

D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of target analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
J	The reported value is less than the Reporting Limit (MRL, CRDL) but greater than or equal to the MDL. Results closer to the MDL have increased relative uncertainty.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
R1	RPD exceeded the method acceptance limit. See case narrative.
U	Less than MDL.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0309**
Reported: 22-Jul-15 14:22

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received	Notes
CT-08 DAY 144	W5G0309-01	Rinsate	09-Jul-15 12:30	VH	15-Jul-2015	
CT-08 DAY 146	W5G0309-02	Rinsate	11-Jul-15 12:05	VH	15-Jul-2015	
CT-08 DAY 148	W5G0309-03	Rinsate	13-Jul-15 13:45	VH	15-Jul-2015	

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.
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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0309**
Reported: 22-Jul-15 14:22

Client Sample ID: **CT-08 DAY 144**
SVL Sample ID: **W5G0309-01 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 09-Jul-15 12:30
Received: 15-Jul-15
Sampled By: VH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	1.15	mg/L	0.08	0.04		W529167	AS	07/17/15 09:52	
EPA 200.7	Iron	< 0.048	mg/L	0.060	0.048		W529167	AS	07/17/15 09:52	U
EPA 200.8	**Antimony**	0.00064	mg/L	0.00300	0.00019		W529203	KWH	07/21/15 09:02	J
EPA 200.8	**Arsenic**	0.00280	mg/L	0.00300	0.00027		W529203	KWH	07/21/15 09:02	J
EPA 200.8	**Barium**	0.0324	mg/L	0.00100	0.000099		W529203	KWH	07/21/15 09:02	
EPA 200.8	**Beryllium**	0.0257	mg/L	0.00020	0.000048		W529203	KWH	07/21/15 09:02	
EPA 200.8	**Cadmium**	0.00935	mg/L	0.00020	0.000072		W529203	KWH	07/21/15 09:02	
EPA 200.8	Chromium	< 0.0004	mg/L	0.0015	0.0004		W529203	KWH	07/21/15 09:02	U
EPA 200.8	**Copper**	7.22	mg/L	0.00300	0.00150	10	W529203	KWH	07/21/15 09:12	M3
EPA 200.8	**Lead**	0.00614	mg/L	0.00300	0.000031		W529203	KWH	07/21/15 09:02	
EPA 200.8	**Manganese**	4.68	mg/L	0.00100	0.000250	10	W529203	KWH	07/21/15 09:12	M3
EPA 200.8	**Nickel**	0.0527	mg/L	0.0010	0.0004		W529203	KWH	07/21/15 09:02	
EPA 200.8	**Selenium**	0.0051	mg/L	0.0030	0.0006		W529203	KWH	07/21/15 09:02	M1
EPA 200.8	**Silver**	0.000346	mg/L	0.000100	0.000021		W529203	KWH	07/21/15 09:02	
EPA 200.8	**Thallium**	0.000209	mg/L	0.00100	0.000026		W529203	KWH	07/21/15 09:02	J
EPA 200.8	**Uranium**	0.00645	mg/L	0.00100	0.000014		W529203	KWH	07/21/15 09:02	
EPA 200.8	**Zinc**	2.33	mg/L	0.0050	0.0010		W529203	KWH	07/21/15 09:02	M3
Metals (Filtered)										
EPA 245.1	**Mercury**	0.00004	mg/L	0.00020	0.00004		W529249	DB	07/21/15 12:44	J
Classical Chemistry Parameters										
EPA 353.2	**Nitrate/Nitrite as N**	0.168	mg/L	0.050	0.017		W530022	BAG	07/22/15 10:46	
SM 2540 C	**Total Diss. Solids**	2380	mg/L	40			W529185	RS	07/16/15 10:15	D1
SM 4500 H B	**pH @22.0°C**	6.12	pH Units				W529178	DKS	07/16/15 08:54	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	13.8	mg/L	1.00	0.28	5	W530106	DT	07/22/15 11:06	D2
EPA 300.0	**Fluoride**	13.1	mg/L	0.500	0.110	5	W530106	DT	07/22/15 11:06	D2
EPA 300.0	**Sulfate as SO4**	1590	mg/L	15.0	2.50	50	W530106	DT	07/22/15 11:15	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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0309**
Reported: 22-Jul-15 14:22

Client Sample ID: **CT-08 DAY 146**
SVL Sample ID: **W5G0309-02 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 11-Jul-15 12:05
Received: 15-Jul-15
Sampled By: VH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	0.48	mg/L	0.08	0.04		W529167	AS	07/17/15 09:58	
EPA 200.7	Iron	< 0.048	mg/L	0.060	0.048		W529167	AS	07/17/15 09:58	U
EPA 200.8	**Antimony**	0.00079	mg/L	0.00300	0.00019		W529203	KWH	07/21/15 09:08	J
EPA 200.8	**Arsenic**	0.00348	mg/L	0.00300	0.00027		W529203	KWH	07/21/15 09:08	
EPA 200.8	**Barium**	0.0316	mg/L	0.00100	0.000099		W529203	KWH	07/21/15 09:08	
EPA 200.8	**Beryllium**	0.0207	mg/L	0.00020	0.000048		W529203	KWH	07/21/15 09:08	
EPA 200.8	**Cadmium**	0.00797	mg/L	0.00020	0.000072		W529203	KWH	07/21/15 09:08	
EPA 200.8	Chromium	< 0.0004	mg/L	0.0015	0.0004		W529203	KWH	07/21/15 09:08	U
EPA 200.8	**Copper**	6.83	mg/L	0.00300	0.00150	10	W529203	KWH	07/21/15 10:07	D2
EPA 200.8	**Lead**	0.00425	mg/L	0.00300	0.000031		W529203	KWH	07/21/15 09:08	
EPA 200.8	**Manganese**	5.09	mg/L	0.00100	0.000250	10	W529203	KWH	07/21/15 10:07	D2
EPA 200.8	**Nickel**	0.0469	mg/L	0.0010	0.0004		W529203	KWH	07/21/15 09:08	
EPA 200.8	**Selenium**	0.0065	mg/L	0.0030	0.0006		W529203	KWH	07/21/15 09:08	
EPA 200.8	**Silver**	0.000307	mg/L	0.000100	0.000021		W529203	KWH	07/21/15 09:08	
EPA 200.8	**Thallium**	0.000199	mg/L	0.00100	0.000026		W529203	KWH	07/21/15 09:08	J
EPA 200.8	**Uranium**	0.00400	mg/L	0.00100	0.000014		W529203	KWH	07/21/15 09:08	
EPA 200.8	**Zinc**	1.94	mg/L	0.0050	0.0010		W529203	KWH	07/21/15 09:08	
Metals (Filtered)										
EPA 245.1	**Mercury**	0.00004	mg/L	0.00020	0.00004		W529249	DB	07/21/15 12:46	J
Classical Chemistry Parameters										
EPA 353.2	**Nitrate/Nitrite as N**	0.896	mg/L	0.050	0.017		W530022	BAG	07/22/15 10:48	
SM 2540 C	**Total Diss. Solids**	2350	mg/L	40			W529185	RS	07/16/15 10:15	D1
SM 4500 H B	**pH @21.8°C**	6.44	pH Units				W529178	DKS	07/16/15 08:56	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	13.8	mg/L	1.00	0.28	5	W530106	DT	07/22/15 11:24	D2
EPA 300.0	**Fluoride**	12.6	mg/L	0.500	0.110	5	W530106	DT	07/22/15 11:24	D2
EPA 300.0	**Sulfate as SO4**	1520	mg/L	15.0	2.50	50	W530106	DT	07/22/15 11:34	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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0309**
Reported: 22-Jul-15 14:22

Client Sample ID: **CT-08 DAY 148**
SVL Sample ID: **W5G0309-03 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 13-Jul-15 13:45
Received: 15-Jul-15
Sampled By: VH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	0.17	mg/L	0.08	0.04		W529167	AS	07/17/15 10:00	
EPA 200.7	Iron	< 0.048	mg/L	0.060	0.048		W529167	AS	07/17/15 10:00	U
EPA 200.8	**Antimony**	0.00081	mg/L	0.00300	0.00019		W529203	KWH	07/21/15 09:10	J
EPA 200.8	**Arsenic**	0.00317	mg/L	0.00300	0.00027		W529203	KWH	07/21/15 09:10	
EPA 200.8	**Barium**	0.0347	mg/L	0.00100	0.000099		W529203	KWH	07/21/15 09:10	
EPA 200.8	**Beryllium**	0.0175	mg/L	0.00020	0.000048		W529203	KWH	07/21/15 09:10	
EPA 200.8	**Cadmium**	0.00728	mg/L	0.00020	0.000072		W529203	KWH	07/21/15 09:10	
EPA 200.8	Chromium	< 0.0004	mg/L	0.0015	0.0004		W529203	KWH	07/21/15 09:10	U
EPA 200.8	**Copper**	4.83	mg/L	0.00300	0.00150	10	W529203	KWH	07/21/15 10:09	D2
EPA 200.8	**Lead**	0.00362	mg/L	0.00300	0.000031		W529203	KWH	07/21/15 09:10	
EPA 200.8	**Manganese**	4.62	mg/L	0.00100	0.000250	10	W529203	KWH	07/21/15 10:09	D2
EPA 200.8	**Nickel**	0.0454	mg/L	0.0010	0.0004		W529203	KWH	07/21/15 09:10	
EPA 200.8	**Selenium**	0.0066	mg/L	0.0030	0.0006		W529203	KWH	07/21/15 09:10	
EPA 200.8	**Silver**	0.000282	mg/L	0.000100	0.000021		W529203	KWH	07/21/15 09:10	
EPA 200.8	**Thallium**	0.000199	mg/L	0.00100	0.000026		W529203	KWH	07/21/15 09:10	J
EPA 200.8	**Uranium**	0.00228	mg/L	0.00100	0.000014		W529203	KWH	07/21/15 09:10	
EPA 200.8	**Zinc**	1.71	mg/L	0.0050	0.0010		W529203	KWH	07/21/15 09:10	
Metals (Filtered)										
EPA 245.1	Mercury	< 0.00004	mg/L	0.00020	0.00004		W529249	DB	07/21/15 12:48	U
Classical Chemistry Parameters										
EPA 353.2	**Nitrate/Nitrite as N**	0.067	mg/L	0.050	0.017		W530022	BAG	07/22/15 10:49	
SM 2540 C	**Total Diss. Solids**	2320	mg/L	40			W529185	RS	07/16/15 10:15	D1
SM 4500 H B	**pH @21.3°C**	6.63	pH Units				W529178	DKS	07/16/15 08:57	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	12.5	mg/L	1.00	0.28	5	W530106	DT	07/22/15 11:43	D2
EPA 300.0	**Fluoride**	12.0	mg/L	0.500	0.110	5	W530106	DT	07/22/15 11:43	D2
EPA 300.0	**Sulfate as SO4**	1510	mg/L	15.0	2.50	50	W530106	DT	07/22/15 11:52	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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0309**
Reported: 22-Jul-15 14:22

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Dissolved)								
EPA 200.7	Aluminum	mg/L	<0.04	0.04	0.08	W529167	17-Jul-15	U
EPA 200.7	Iron	mg/L	<0.048	0.048	0.060	W529167	17-Jul-15	U
EPA 200.8	Antimony	mg/L	<0.00019	0.00019	0.00300	W529203	21-Jul-15	U
EPA 200.8	Arsenic	mg/L	<0.00027	0.00027	0.00300	W529203	21-Jul-15	U
EPA 200.8	Barium	mg/L	<0.000099	0.000099	0.00100	W529203	21-Jul-15	U
EPA 200.8	Beryllium	mg/L	<0.000048	0.000048	0.00020	W529203	21-Jul-15	U
EPA 200.8	Cadmium	mg/L	<0.000072	0.000072	0.00020	W529203	21-Jul-15	U
EPA 200.8	Chromium	mg/L	<0.0004	0.0004	0.0015	W529203	21-Jul-15	U
EPA 200.8	Copper	mg/L	<0.00015	0.00015	0.00100	W529203	21-Jul-15	U
EPA 200.8	Lead	mg/L	<0.000031	0.000031	0.00300	W529203	21-Jul-15	U
EPA 200.8	Manganese	mg/L	<0.000025	0.000025	0.00100	W529203	21-Jul-15	U
EPA 200.8	Nickel	mg/L	<0.0004	0.0004	0.0010	W529203	21-Jul-15	U
EPA 200.8	Selenium	mg/L	<0.0006	0.0006	0.0030	W529203	21-Jul-15	U
EPA 200.8	Silver	mg/L	<0.000021	0.000021	0.000100	W529203	21-Jul-15	U
EPA 200.8	Thallium	mg/L	<0.000026	0.000026	0.00100	W529203	21-Jul-15	U
EPA 200.8	Uranium	mg/L	<0.000014	0.000014	0.00100	W529203	21-Jul-15	U
EPA 200.8	Zinc	mg/L	<0.0010	0.0010	0.0050	W529203	21-Jul-15	U
Metals (Filtered)								
EPA 245.1	Mercury	mg/L	<0.00004	0.00004	0.00020	W529249	21-Jul-15	U
Classical Chemistry Parameters								
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.050	0.017	0.050	W530022	22-Jul-15	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W529185	16-Jul-15	
Anions by Ion Chromatography								
EPA 300.0	Chloride	mg/L	<0.06	0.06	0.20	W530106	22-Jul-15	U
EPA 300.0	Fluoride	mg/L	<0.022	0.022	0.100	W530106	22-Jul-15	U
EPA 300.0	Sulfate as SO4	mg/L	<0.05	0.05	0.30	W530106	22-Jul-15	U

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	0.96	1.00	96.2	85 - 115	W529167	17-Jul-15	
EPA 200.7	Iron	mg/L	9.47	10.0	94.7	85 - 115	W529167	17-Jul-15	
EPA 200.8	Antimony	mg/L	0.0221	0.0250	88.4	85 - 115	W529203	21-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0241	0.0250	96.4	85 - 115	W529203	21-Jul-15	
EPA 200.8	Barium	mg/L	0.0232	0.0250	92.9	85 - 115	W529203	21-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0243	0.0250	97.0	85 - 115	W529203	21-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0237	0.0250	94.9	85 - 115	W529203	21-Jul-15	
EPA 200.8	Chromium	mg/L	0.0229	0.0250	91.8	85 - 115	W529203	21-Jul-15	
EPA 200.8	Copper	mg/L	0.0231	0.0250	92.3	85 - 115	W529203	21-Jul-15	
EPA 200.8	Lead	mg/L	0.0235	0.0250	94.0	85 - 115	W529203	21-Jul-15	
EPA 200.8	Manganese	mg/L	0.0228	0.0250	91.0	85 - 115	W529203	21-Jul-15	
EPA 200.8	Nickel	mg/L	0.0225	0.0250	90.2	85 - 115	W529203	21-Jul-15	
EPA 200.8	Selenium	mg/L	0.0259	0.0250	104	85 - 115	W529203	21-Jul-15	
EPA 200.8	Silver	mg/L	0.0235	0.0250	93.8	85 - 115	W529203	21-Jul-15	
EPA 200.8	Thallium	mg/L	0.0233	0.0250	93.3	85 - 115	W529203	21-Jul-15	
EPA 200.8	Uranium	mg/L	0.0232	0.0250	92.9	85 - 115	W529203	21-Jul-15	
EPA 200.8	Zinc	mg/L	0.0242	0.0250	96.9	85 - 115	W529203	21-Jul-15	
Metals (Filtered)									
EPA 245.1	Mercury	mg/L	0.00515	0.00500	103	85 - 115	W529249	21-Jul-15	

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0309**
Reported: 22-Jul-15 14:22

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Classical Chemistry Parameters									
EPA 353.2	Nitrate/Nitrite as N	mg/L	2.01	2.00	100	90 - 110	W530022	22-Jul-15	
Anions by Ion Chromatography									
EPA 300.0	Chloride	mg/L	2.76	3.00	92.0	90 - 110	W530106	22-Jul-15	
EPA 300.0	Fluoride	mg/L	1.87	2.00	93.3	90 - 110	W530106	22-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	9.54	10.0	95.4	90 - 110	W530106	22-Jul-15	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters									
SM 2540 C	Total Diss. Solids	mg/L	265	257	3.1	10	W529185	16-Jul-15	
SM 2540 C	Total Diss. Solids	mg/L	343	333	3.0	10	W529185	16-Jul-15	
SM 4500 H B	pH	pH Units	7.10	7.22	1.7	20	W529178	16-Jul-15	R1B

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	mg/L	2.21	1.15	1.00	106	70 - 130	W529167	17-Jul-15	
EPA 200.7	Iron	mg/L	9.56	<0.048	10.0	95.6	70 - 130	W529167	17-Jul-15	
EPA 200.8	Antimony	mg/L	0.0215	0.00064	0.0250	83.3	70 - 130	W529203	21-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0309	0.00280	0.0250	112	70 - 130	W529203	21-Jul-15	
EPA 200.8	Barium	mg/L	0.0588	0.0324	0.0250	106	70 - 130	W529203	21-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0458	0.0257	0.0250	80.4	70 - 130	W529203	21-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0327	0.00935	0.0250	93.6	70 - 130	W529203	21-Jul-15	
EPA 200.8	Chromium	mg/L	0.0237	<0.0004	0.0250	94.8	70 - 130	W529203	21-Jul-15	
EPA 200.8	Copper	mg/L	7.70	7.22	0.0250	R > 4S	70 - 130	W529203	21-Jul-15	M3
EPA 200.8	Lead	mg/L	0.0272	0.00614	0.0250	84.4	70 - 130	W529203	21-Jul-15	
EPA 200.8	Manganese	mg/L	4.95	4.68	0.0250	R > 4S	70 - 130	W529203	21-Jul-15	M3
EPA 200.8	Nickel	mg/L	0.0750	0.0527	0.0250	89.2	70 - 130	W529203	21-Jul-15	
EPA 200.8	Selenium	mg/L	0.0385	0.0051	0.0250	134	70 - 130	W529203	21-Jul-15	M1
EPA 200.8	Silver	mg/L	0.0217	0.000346	0.0250	85.4	70 - 130	W529203	21-Jul-15	
EPA 200.8	Thallium	mg/L	0.0216	0.000209	0.0250	85.5	70 - 130	W529203	21-Jul-15	
EPA 200.8	Uranium	mg/L	0.0303	0.00645	0.0250	95.3	70 - 130	W529203	21-Jul-15	
EPA 200.8	Zinc	mg/L	2.41	2.33	0.0250	R > 4S	70 - 130	W529203	21-Jul-15	M3
Metals (Filtered)										
EPA 245.1	Mercury	mg/L	0.00286	0.00185	0.00100	101	70 - 130	W529249	21-Jul-15	
EPA 245.1	Mercury	mg/L	0.00106	<0.00004	0.00100	106	70 - 130	W529249	21-Jul-15	
Classical Chemistry Parameters										
EPA 353.2	Nitrate/Nitrite as N	mg/L	6.41	4.73	2.00	83.7	90 - 110	W530022	22-Jul-15	D2,M2
EPA 353.2	Nitrate/Nitrite as N	mg/L	5.67	3.69	2.00	98.8	90 - 110	W530022	22-Jul-15	D2
Anions by Ion Chromatography										
EPA 300.0	Chloride	mg/L	7.74	4.45	3.00	110	90 - 110	W530106	22-Jul-15	
EPA 300.0	Fluoride	mg/L	2.27	0.029	2.00	112	90 - 110	W530106	22-Jul-15	M1
EPA 300.0	Sulfate as SO4	mg/L	37.0	25.7	10.0	113	90 - 110	W530106	22-Jul-15	M1

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Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0309**
Reported: 22-Jul-15 14:22

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	%R	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Dissolved)											
EPA 200.7	Aluminum	mg/L	2.18	2.21	1.00	102	1.6	20	W529167	17-Jul-15	
EPA 200.7	Iron	mg/L	9.54	9.56	10.0	95.4	0.2	20	W529167	17-Jul-15	
EPA 200.8	Antimony	mg/L	0.0198	0.0215	0.0250	76.5	8.3	20	W529203	21-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0296	0.0309	0.0250	107	4.2	20	W529203	21-Jul-15	
EPA 200.8	Barium	mg/L	0.0565	0.0588	0.0250	96.5	4.0	20	W529203	21-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0449	0.0458	0.0250	77.0	1.9	20	W529203	21-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0307	0.0327	0.0250	85.5	6.4	20	W529203	21-Jul-15	
EPA 200.8	Chromium	mg/L	0.0218	0.0237	0.0250	87.3	8.3	20	W529203	21-Jul-15	
EPA 200.8	Copper	mg/L	7.87	7.70	0.0250	R > 4S	2.1	20	W529203	21-Jul-15	M3
EPA 200.8	Lead	mg/L	0.0258	0.0272	0.0250	78.8	5.3	20	W529203	21-Jul-15	
EPA 200.8	Manganese	mg/L	5.10	4.95	0.0250	R > 4S	2.9	20	W529203	21-Jul-15	M3
EPA 200.8	Nickel	mg/L	0.0707	0.0750	0.0250	72.0	5.9	20	W529203	21-Jul-15	
EPA 200.8	Selenium	mg/L	0.0382	0.0385	0.0250	132	0.8	20	W529203	21-Jul-15	M1
EPA 200.8	Silver	mg/L	0.0200	0.0217	0.0250	78.8	7.9	20	W529203	21-Jul-15	
EPA 200.8	Thallium	mg/L	0.0206	0.0216	0.0250	81.4	4.9	20	W529203	21-Jul-15	
EPA 200.8	Uranium	mg/L	0.0291	0.0303	0.0250	90.5	4.1	20	W529203	21-Jul-15	
EPA 200.8	Zinc	mg/L	2.26	2.41	0.0250	R > 4S	6.3	20	W529203	21-Jul-15	M3
Metals (Filtered)											
EPA 245.1	Mercury	mg/L	0.00290	0.00286	0.00100	105	1.4	20	W529249	21-Jul-15	
Classical Chemistry Parameters											
EPA 353.2	Nitrate/Nitrite as N	mg/L	6.61	6.41	2.00	94.1	3.2	20	W530022	22-Jul-15	D2
Anions by Ion Chromatography											
EPA 300.0	Chloride	mg/L	7.75	7.74	3.00	110	0.1	20	W530106	22-Jul-15	
EPA 300.0	Fluoride	mg/L	2.28	2.27	2.00	113	0.2	20	W530106	22-Jul-15	M1
EPA 300.0	Sulfate as SO4	mg/L	37.0	37.0	10.0	113	0.1	20	W530106	22-Jul-15	M1

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Excelsior Mining Corp.	**Project Name: Gunnison Copper 2015**
2999 N. 44th St. #300	Work Order: **W5G0309**
Phoenix, AZ 85018	Reported: 22-Jul-15 14:22

Notes and Definitions

D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of target analyte.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
J	The reported value is less than the Reporting Limit (MRL, CRDL) but greater than or equal to the MDL. Results closer to the MDL have increased relative uncertainty.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
R1B	RPD exceeded the method acceptance limit.
U	Less than MDL.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received	Notes
CT-08 DAY 129	W5G0441-01	Rinsate	20-Jul-15 15:40	RT	22-Jul-2015	
CT-08 DAY 123	W5G0441-02	Rinsate	20-Jul-15 16:00	RT	22-Jul-2015	
CT-08 DAY 121	W5G0441-03	Rinsate	20-Jul-15 16:25	RT	22-Jul-2015	
CT-08 DAY 119	W5G0441-04	Rinsate	20-Jul-15 16:40	RT	22-Jul-2015	
CT-08 DAY 117	W5G0441-05	Rinsate	20-Jul-15 16:55	RT	22-Jul-2015	
CT-08 DAY 116	W5G0441-06	Rinsate	20-Jul-15 17:05	RT	22-Jul-2015	
CT-08 DAY 136	W5G0441-07	Rinsate	20-Jul-15 17:30	RT	22-Jul-2015	

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.
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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Client Sample ID: **CT-08 DAY 129**
SVL Sample ID: **W5G0441-01 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 20-Jul-15 15:40
Received: 22-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	70.7	mg/L	0.08	0.04		W530241	STA	07/24/15 13:07	
EPA 200.7	**Iron**	1.21	mg/L	0.060	0.048		W530241	STA	07/24/15 13:07	
EPA 200.8	**Barium**	0.0416	mg/L	0.00400	0.00099	10	W531033	KWH	07/28/15 12:00	D1
EPA 200.8	**Beryllium**	0.134	mg/L	0.0160	0.00480	100	W531033	KWH	07/28/15 10:56	D1,D2,D8
EPA 200.8	**Cadmium**	0.0589	mg/L	0.00100	0.00072	10	W531033	KWH	07/28/15 12:00	D1,D2
EPA 200.8	**Copper**	84.7	mg/L	0.0300	0.0150	100	W531033	KWH	07/28/15 10:56	D2
EPA 200.8	**Manganese**	27.3	mg/L	0.0100	0.00250	100	W531033	KWH	07/28/15 10:56	D2
EPA 200.8	**Nickel**	0.243	mg/L	0.0500	0.0390	100	W531033	KWH	07/28/15 10:56	D1
EPA 200.8	**Zinc**	16.3	mg/L	0.400	0.100	100	W531033	KWH	07/28/15 10:56	D2
Classical Chemistry Parameters										
SM 4500 H B	**pH @18.8°C**	3.28	pH Units				W530202	DKS	07/23/15 12:43	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	31.7	mg/L	10.0	2.80	50	W531059	DT	07/27/15 16:39	D2
EPA 300.0	**Fluoride**	78.1	mg/L	5.00	1.10	50	W531059	DT	07/27/15 16:39	D2
EPA 300.0	**Sulfate as SO4**	2500	mg/L	15.0	2.50	50	W531059	DT	07/27/15 16:39	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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Client Sample ID: **CT-08 DAY 123**
SVL Sample ID: **W5G0441-02 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 20-Jul-15 16:00
Received: 22-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	647	mg/L	0.80	0.36	10	W530241	STA	07/24/15 13:09	D1
EPA 200.7	**Iron**	17.9	mg/L	0.600	0.480	10	W530241	STA	07/24/15 13:09	D1
EPA 200.8	**Barium**	0.0500	mg/L	0.00400	0.00099	10	W531033	KWH	07/28/15 12:02	D1
EPA 200.8	**Beryllium**	0.589	mg/L	0.0160	0.00480	100	W531033	KWH	07/28/15 10:58	D1,D2,D8
EPA 200.8	**Cadmium**	0.455	mg/L	0.0100	0.00720	100	W531033	KWH	07/28/15 10:58	D1,D2
EPA 200.8	**Copper**	353	mg/L	0.150	0.0750	500	W531033	KWH	07/28/15 11:20	D2
EPA 200.8	**Manganese**	198	mg/L	0.0100	0.00250	100	W531033	KWH	07/28/15 10:58	D2
EPA 200.8	**Nickel**	1.68	mg/L	0.0500	0.0390	100	W531033	KWH	07/28/15 10:58	D1
EPA 200.8	**Zinc**	108	mg/L	0.400	0.100	100	W531033	KWH	07/28/15 10:58	D2
Classical Chemistry Parameters										
SM 4500 H B	**pH @19.1°C**	2.45	pH Units				W530202	DKS	07/23/15 12:45	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	107	mg/L	20.0	5.60	100	W531059	DT	07/27/15 16:57	D2
EPA 300.0	**Fluoride**	193	mg/L	10.0	2.20	100	W531059	DT	07/27/15 16:57	D2
EPA 300.0	**Sulfate as SO4**	9740	mg/L	300	50.0	1000	W531059	DT	07/27/15 20:36	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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Client Sample ID: **CT-08 DAY 121**
SVL Sample ID: **W5G0441-03 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 20-Jul-15 16:25
Received: 22-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	1400	mg/L	4.00	1.80	50	W530241	STA	07/24/15 13:11	D1
EPA 200.7	**Iron**	67.2	mg/L	3.00	2.40	50	W530241	STA	07/24/15 13:11	D1
EPA 200.8	**Barium**	0.0576	mg/L	0.00400	0.00099	10	W531033	KWH	07/28/15 12:03	D1
EPA 200.8	**Beryllium**	1.07	mg/L	0.0160	0.00480	100	W531033	KWH	07/28/15 11:04	D1,D2,D8
EPA 200.8	**Cadmium**	0.896	mg/L	0.0100	0.00720	100	W531033	KWH	07/28/15 11:04	D1,D2
EPA 200.8	**Copper**	558	mg/L	0.150	0.0750	500	W531033	KWH	07/28/15 11:22	D2
EPA 200.8	**Manganese**	399	mg/L	0.0500	0.0125	500	W531033	KWH	07/28/15 11:22	D2
EPA 200.8	**Nickel**	3.29	mg/L	0.0500	0.0390	100	W531033	KWH	07/28/15 11:04	D1
EPA 200.8	**Zinc**	201	mg/L	0.400	0.100	100	W531033	KWH	07/28/15 11:04	D2
Classical Chemistry Parameters										
SM 4500 H B	**pH @19.1°C**	2.14	pH Units				W530202	DKS	07/23/15 12:47	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	425	mg/L	20.0	5.60	100	W531059	DT	07/27/15 17:34	D2
EPA 300.0	**Fluoride**	440	mg/L	100	22.0	1000	W531059	DT	07/27/15 21:03	D2
EPA 300.0	**Sulfate as SO4**	19200	mg/L	300	50.0	1000	W531059	DT	07/27/15 21:03	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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Client Sample ID: **CT-08 DAY 119**
SVL Sample ID: **W5G0441-04 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 20-Jul-15 16:40
Received: 22-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	2700	mg/L	4.00	1.80	50	W530241	STA	07/24/15 13:14	D1
EPA 200.7	**Iron**	165	mg/L	3.00	2.40	50	W530241	STA	07/24/15 13:14	D1
EPA 200.8	**Barium**	0.0691	mg/L	0.00400	0.00099	10	W531033	KWH	07/28/15 12:05	D1
EPA 200.8	**Beryllium**	1.80	mg/L	0.0160	0.00480	100	W531033	KWH	07/28/15 11:06	D1,D2,D8
EPA 200.8	**Cadmium**	1.69	mg/L	0.0100	0.00720	100	W531033	KWH	07/28/15 11:06	D1,D2
EPA 200.8	**Copper**	736	mg/L	0.300	0.150	1000	W531033	KWH	07/28/15 11:24	D2
EPA 200.8	**Manganese**	777	mg/L	0.100	0.0250	1000	W531033	KWH	07/28/15 11:24	D2
EPA 200.8	**Nickel**	6.22	mg/L	0.0500	0.0390	100	W531033	KWH	07/28/15 11:06	D2
EPA 200.8	**Zinc**	387	mg/L	4.00	1.00	1000	W531033	KWH	07/28/15 11:24	D2
Classical Chemistry Parameters										
SM 4500 H B	**pH @17.9°C**	1.71	pH Units				W530202	DKS	07/23/15 12:49	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	153	mg/L	100	28.0	500	W531059	DT	07/27/15 17:52	D2
EPA 300.0	**Fluoride**	798	mg/L	500	110	5000	W531059	DT	07/27/15 21:13	D2
EPA 300.0	**Sulfate as SO4**	34500	mg/L	1500	250	5000	W531059	DT	07/27/15 21:13	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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2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Client Sample ID: **CT-08 DAY 117**
SVL Sample ID: **W5G0441-05 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 20-Jul-15 16:55
Received: 22-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	6030	mg/L	4.00	1.80	50	W530241	STA	07/24/15 13:16	D1
EPA 200.7	**Iron**	239	mg/L	3.00	2.40	50	W530241	STA	07/24/15 13:16	D1
EPA 200.8	**Barium**	0.0724	mg/L	0.00400	0.00099	10	W531033	KWH	07/28/15 12:07	D1
EPA 200.8	**Beryllium**	3.29	mg/L	0.0160	0.00480	100	W531033	KWH	07/28/15 11:08	D8
EPA 200.8	**Cadmium**	3.76	mg/L	0.0100	0.00720	100	W531033	KWH	07/28/15 11:08	D2
EPA 200.8	**Copper**	803	mg/L	0.300	0.150	1000	W531033	KWH	07/28/15 11:26	D2
EPA 200.8	**Manganese**	1710	mg/L	0.100	0.0250	1000	W531033	KWH	07/28/15 11:26	D2
EPA 200.8	**Nickel**	13.6	mg/L	0.0500	0.0390	100	W531033	KWH	07/28/15 11:08	D2
EPA 200.8	**Zinc**	835	mg/L	4.00	1.00	1000	W531033	KWH	07/28/15 11:26	D2
Classical Chemistry Parameters										
SM 4500 H B	**pH @17.9°C**	1.39	pH Units				W530202	DKS	07/23/15 12:52	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	46.5	mg/L	100	28.0	500	W531059	DT	07/27/15 18:10	D1,J
EPA 300.0	**Fluoride**	1380	mg/L	500	110	5000	W531059	DT	07/27/15 21:22	D2
EPA 300.0	**Sulfate as SO4**	78700	mg/L	1500	250	5000	W531059	DT	07/27/15 21:22	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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Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Client Sample ID: **CT-08 DAY 116**
SVL Sample ID: **W5G0441-06 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 20-Jul-15 17:05
Received: 22-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	8010	mg/L	8.00	3.60	100	W530241	STA	07/24/15 14:25	D1
EPA 200.7	**Iron**	358	mg/L	6.00	4.80	100	W530241	STA	07/24/15 14:25	D1
EPA 200.8	**Barium**	0.0614	mg/L	0.0400	0.00990	100	W531033	KWH	07/28/15 11:10	D8
EPA 200.8	**Beryllium**	4.07	mg/L	0.0160	0.00480	100	W531033	KWH	07/28/15 11:10	D2
EPA 200.8	**Cadmium**	4.97	mg/L	0.0100	0.00720	100	W531033	KWH	07/28/15 11:10	D2
EPA 200.8	**Copper**	1100	mg/L	0.300	0.150	1000	W531033	KWH	07/28/15 11:40	D2
EPA 200.8	**Manganese**	2270	mg/L	0.100	0.0250	1000	W531033	KWH	07/28/15 11:40	D2
EPA 200.8	**Nickel**	17.9	mg/L	0.0500	0.0390	100	W531033	KWH	07/28/15 11:10	D2
EPA 200.8	**Zinc**	1100	mg/L	4.00	1.00	1000	W531033	KWH	07/28/15 11:40	D2
Classical Chemistry Parameters										
SM 4500 H B	**pH @18.8°C**	1.31	pH Units				W530202	DKS	07/23/15 12:55	H5
Anions by Ion Chromatography										
EPA 300.0	Chloride	< 280	mg/L	1000	280	5000	W531059	DT	07/27/15 21:31	D1,U
EPA 300.0	**Fluoride**	1790	mg/L	500	110	5000	W531059	DT	07/27/15 21:31	D2
EPA 300.0	**Sulfate as SO4**	101000	mg/L	1500	250	5000	W531059	DT	07/27/15 21:31	D2

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

John Kern
Laboratory Director

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Excelsior Mining Corp.
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Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Client Sample ID: **CT-08 DAY 136**
SVL Sample ID: **W5G0441-07 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 20-Jul-15 17:30
Received: 22-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	**Aluminum**	9.79	mg/L	0.08	0.04		W530241	STA	07/24/15 13:30	
EPA 200.7	**Iron**	0.135	mg/L	0.060	0.048		W530241	STA	07/24/15 13:30	
EPA 200.8	**Barium**	0.0317	mg/L	0.00400	0.00099	10	W531033	KWH	07/28/15 12:11	D1
EPA 200.8	**Beryllium**	0.0634	mg/L	0.00160	0.00048	10	W531033	KWH	07/28/15 12:11	D8
EPA 200.8	**Cadmium**	0.0179	mg/L	0.00100	0.00072	10	W531033	KWH	07/28/15 12:11	D1
EPA 200.8	**Copper**	24.7	mg/L	0.0300	0.0150	100	W531033	KWH	07/28/15 11:12	D2
EPA 200.8	**Manganese**	9.26	mg/L	0.0100	0.00250	100	W531033	KWH	07/28/15 11:12	D2
EPA 200.8	**Nickel**	0.0837	mg/L	0.0050	0.0039	10	W531033	KWH	07/28/15 12:11	D1
EPA 200.8	**Zinc**	5.52	mg/L	0.400	0.100	100	W531033	KWH	07/28/15 11:12	D2
Classical Chemistry Parameters										
SM 4500 H B	**pH @20.0°C**	4.01	pH Units				W530202	DKS	07/23/15 12:57	H5
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	14.1	mg/L	1.00	0.28	5	W531059	DT	07/27/15 18:38	D2
EPA 300.0	**Fluoride**	21.9	mg/L	10.0	2.20	100	W531059	DT	07/27/15 21:40	D2
EPA 300.0	**Sulfate as SO4**	1770	mg/L	15.0	2.50	50	W531059	DT	07/27/15 18:47	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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Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Dissolved)								
EPA 200.7	Aluminum	mg/L	<0.04	0.04	0.08	W530241	24-Jul-15	U
EPA 200.7	Iron	mg/L	<0.048	0.048	0.060	W530241	24-Jul-15	U
EPA 200.8	Barium	mg/L	<0.000099	0.000099	0.00100	W531033	28-Jul-15	U
EPA 200.8	Beryllium	mg/L	<0.000048	0.000048	0.00020	W531033	28-Jul-15	U
EPA 200.8	Cadmium	mg/L	<0.000072	0.000072	0.00020	W531033	28-Jul-15	U
EPA 200.8	Copper	mg/L	<0.00015	0.00015	0.00100	W531033	28-Jul-15	U
EPA 200.8	Manganese	mg/L	<0.000025	0.000025	0.00100	W531033	28-Jul-15	U
EPA 200.8	Nickel	mg/L	<0.0004	0.0004	0.0010	W531033	28-Jul-15	U
EPA 200.8	Zinc	mg/L	<0.0010	0.0010	0.0050	W531033	28-Jul-15	U
Anions by Ion Chromatography								
EPA 300.0	Chloride	mg/L	<0.06	0.06	0.20	W531059	27-Jul-15	U
EPA 300.0	Fluoride	mg/L	<0.022	0.022	0.100	W531059	27-Jul-15	U
EPA 300.0	Sulfate as SO4	mg/L	<0.05	0.05	0.30	W531059	27-Jul-15	U

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	0.99	1.00	99.1	85 - 115	W530241	24-Jul-15	
EPA 200.7	Iron	mg/L	9.23	10.0	92.3	85 - 115	W530241	24-Jul-15	
EPA 200.8	Barium	mg/L	0.0251	0.0250	100	85 - 115	W531033	28-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0247	0.0250	98.7	85 - 115	W531033	28-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0259	0.0250	103	85 - 115	W531033	28-Jul-15	
EPA 200.8	Copper	mg/L	0.0250	0.0250	100	85 - 115	W531033	28-Jul-15	
EPA 200.8	Manganese	mg/L	0.0252	0.0250	101	85 - 115	W531033	28-Jul-15	
EPA 200.8	Nickel	mg/L	0.0250	0.0250	99.9	85 - 115	W531033	28-Jul-15	
EPA 200.8	Zinc	mg/L	0.0258	0.0250	103	85 - 115	W531033	28-Jul-15	
Anions by Ion Chromatography									
EPA 300.0	Chloride	mg/L	3.07	3.00	102	90 - 110	W531059	27-Jul-15	
EPA 300.0	Fluoride	mg/L	2.00	2.00	99.9	90 - 110	W531059	27-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	10.3	10.0	103	90 - 110	W531059	27-Jul-15	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters									
SM 4500 H B	pH	pH Units	4.11	4.01	2.5	20	W530202	23-Jul-15	
SM 4500 H B	pH	pH Units	8.64	8.68	0.5	20	W530202	23-Jul-15	

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Project Name: Gunnison Copper 2015
Work Order: **W5G0441**
Reported: 29-Jul-15 14:10

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	mg/L	10.8	9.79	1.00	102	70 - 130	W530241	24-Jul-15	
EPA 200.7	Aluminum	mg/L	0.99	<0.036	1.00	99.0	70 - 130	W530241	24-Jul-15	
EPA 200.7	Iron	mg/L	9.39	0.135	10.0	92.6	70 - 130	W530241	24-Jul-15	
EPA 200.7	Iron	mg/L	9.52	0.074	10.0	94.5	70 - 130	W530241	24-Jul-15	
EPA 200.8	Barium	mg/L	0.0558	0.0303	0.0250	102	70 - 130	W531033	28-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0266	<0.000048	0.0250	106	70 - 130	W531033	28-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0268	<0.000072	0.0250	107	70 - 130	W531033	28-Jul-15	
EPA 200.8	Copper	mg/L	0.0263	0.00136	0.0250	99.9	70 - 130	W531033	28-Jul-15	
EPA 200.8	Manganese	mg/L	0.0264	0.000952	0.0250	102	70 - 130	W531033	28-Jul-15	
EPA 200.8	Nickel	mg/L	0.0261	0.0009	0.0250	101	70 - 130	W531033	28-Jul-15	
EPA 200.8	Zinc	mg/L	0.0343	0.0061	0.0250	113	70 - 130	W531033	28-Jul-15	
Anions by Ion Chromatography										
EPA 300.0	Chloride	mg/L	73.8	73.9	3.00	R > 4S	90 - 110	W531059	27-Jul-15	D2,M3
EPA 300.0	Fluoride	mg/L	2.85	0.710	2.00	107	90 - 110	W531059	28-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	181	173	10.0	R > 4S	90 - 110	W531059	27-Jul-15	D2,M3

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	%R	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Dissolved)											
EPA 200.7	Aluminum	mg/L	10.9	10.8	1.00	107	0.5	20	W530241	24-Jul-15	
EPA 200.7	Iron	mg/L	9.52	9.39	10.0	93.8	1.3	20	W530241	24-Jul-15	
EPA 200.8	Barium	mg/L	0.0558	0.0558	0.0250	102	0.0	20	W531033	28-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0269	0.0266	0.0250	108	1.1	20	W531033	28-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0272	0.0268	0.0250	109	1.2	20	W531033	28-Jul-15	
EPA 200.8	Copper	mg/L	0.0265	0.0263	0.0250	101	0.8	20	W531033	28-Jul-15	
EPA 200.8	Manganese	mg/L	0.0264	0.0264	0.0250	102	0.3	20	W531033	28-Jul-15	
EPA 200.8	Nickel	mg/L	0.0256	0.0261	0.0250	98.7	2.1	20	W531033	28-Jul-15	
EPA 200.8	Zinc	mg/L	0.0358	0.0343	0.0250	119	4.2	20	W531033	28-Jul-15	
Anions by Ion Chromatography											
EPA 300.0	Chloride	mg/L	73.6	73.8	3.00	R > 4S	0.3	20	W531059	27-Jul-15	D2,M3
EPA 300.0	Fluoride	mg/L	2.78	2.85	2.00	103	2.5	20	W531059	28-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	180	181	10.0	R > 4S	0.3	20	W531059	27-Jul-15	D2,M3

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Excelsior Mining Corp.	**Project Name: Gunnison Copper 2015**
2999 N. 44th St. #300	Work Order: **W5G0441**
Phoenix, AZ 85018	Reported: 29-Jul-15 14:10

Notes and Definitions

D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of target analyte.
D8	Sample required dilution to meet internal standard recovery limits.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
J	The reported value is less than the Reporting Limit (MRL, CRDL) but greater than or equal to the MDL. Results closer to the MDL have increased relative uncertainty.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
U	Less than MDL.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0513**
Reported: 31-Jul-15 16:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received	Notes
JC WATER	W5G0513-01	Rinsate	23-Jul-15 13:00	RT	24-Jul-2015	
MAG R&D TAP WATER	W5G0513-02	Rinsate	23-Jul-15 13:20	RT	24-Jul-2015	

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested. Non-Detects are reported at the MDL.
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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0513**
Reported: 31-Jul-15 16:12

Client Sample ID: **JC WATER**
SVL Sample ID: **W5G0513-01 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 23-Jul-15 13:00
Received: 24-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.04	mg/L	0.08	0.04		W530275	STA	07/27/15 13:59	U
EPA 200.7	**Calcium**	20.0	mg/L	0.100	0.058		W530275	STA	07/27/15 13:59	
EPA 200.7	Iron	< 0.048	mg/L	0.060	0.048		W530275	STA	07/27/15 13:59	U
EPA 200.7	**Magnesium**	22.4	mg/L	0.20	0.11		W530275	STA	07/27/15 13:59	
EPA 200.7	**Potassium**	1.84	mg/L	0.50	0.25		W530275	STA	07/27/15 13:59	
EPA 200.7	**Sodium**	11.7	mg/L	0.50	0.10		W530275	STA	07/27/15 13:59	
EPA 200.8	Antimony	< 0.00019	mg/L	0.00300	0.00019		W531033	KWH	07/28/15 10:50	U
EPA 200.8	**Arsenic**	0.00483	mg/L	0.00300	0.00027		W531033	KWH	07/28/15 10:50	
EPA 200.8	**Barium**	0.0303	mg/L	0.00100	0.000099		W531033	KWH	07/28/15 10:50	
EPA 200.8	Beryllium	< 0.000048	mg/L	0.00020	0.000048		W531033	KWH	07/28/15 10:50	U
EPA 200.8	Cadmium	< 0.000072	mg/L	0.00020	0.000072		W531033	KWH	07/28/15 10:50	U
EPA 200.8	**Chromium**	0.0092	mg/L	0.0015	0.0004		W531033	KWH	07/28/15 10:50	
EPA 200.8	**Copper**	0.00136	mg/L	0.00100	0.00015		W531033	KWH	07/28/15 10:50	
EPA 200.8	**Lead**	0.00102	mg/L	0.00300	0.000031		W531033	KWH	07/28/15 10:50	J
EPA 200.8	**Manganese**	0.000952	mg/L	0.00100	0.000025		W531033	KWH	07/28/15 10:50	J
EPA 200.8	**Nickel**	0.0009	mg/L	0.0010	0.0004		W531033	KWH	07/28/15 10:50	J
EPA 200.8	**Selenium**	0.0013	mg/L	0.0030	0.0006		W531033	KWH	07/28/15 10:50	M1,J
EPA 200.8	Silver	< 0.000021	mg/L	0.000100	0.000021		W531033	KWH	07/28/15 10:50	U
EPA 200.8	Thallium	< 0.000026	mg/L	0.00100	0.000026		W531033	KWH	07/28/15 10:50	U
EPA 200.8	**Zinc**	0.0061	mg/L	0.0050	0.0010		W531033	KWH	07/28/15 10:50	
Metals (Filtered)										
EPA 245.1	Mercury	< 0.00004	mg/L	0.00020	0.00004		W531134	DB	07/31/15 14:18	U
Classical Chemistry Parameters										
EPA 353.2	**Nitrate/Nitrite as N**	1.21	mg/L	0.050	0.017		W531009	BAG	07/28/15 12:35	
SM 2320B	**Total Alkalinity**	142	mg/L as CaCO3	1.0			W530270	DKS	07/27/15 11:32	
SM 2320B	**Bicarbonate**	142	mg/L as CaCO3	1.0			W530270	DKS	07/27/15 11:32	
SM 2320B	Carbonate	< 1.0	mg/L as CaCO3	1.0			W530270	DKS	07/27/15 11:32	R2B
SM 2540 C	**Total Diss. Solids**	211	mg/L	10			W531062	RS	07/28/15 12:30	
SM 4500 H B	**pH @19.0°C**	7.81	pH Units				W530270	DKS	07/27/15 11:32	H3,R1B
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	39.1	mg/L	1.00	0.28	5	W531059	DT	07/27/15 19:14	D2
EPA 300.0	**Fluoride**	1.15	mg/L	0.500	0.110	5	W531059	DT	07/28/15 15:48	D1
EPA 300.0	**Sulfate as SO4**	91.5	mg/L	1.50	0.25	5	W531059	DT	07/27/15 19:14	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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0513**
Reported: 31-Jul-15 16:12

Client Sample ID: **MAG R&D TAP WATER**
SVL Sample ID: **W5G0513-02 (Rinsate)**

Sample Report Page 1 of 1

Sampled: 23-Jul-15 13:20
Received: 24-Jul-15
Sampled By: RT

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	< 0.04	mg/L	0.08	0.04		W530275	STA	07/27/15 14:01	U
EPA 200.7	**Calcium**	71.4	mg/L	0.100	0.058		W530275	STA	07/27/15 14:01	
EPA 200.7	Iron	< 0.048	mg/L	0.060	0.048		W530275	STA	07/27/15 14:01	U
EPA 200.7	**Magnesium**	9.08	mg/L	0.20	0.11		W530275	STA	07/27/15 14:01	
EPA 200.7	**Potassium**	2.86	mg/L	0.50	0.25		W530275	STA	07/27/15 14:01	
EPA 200.7	**Sodium**	59.7	mg/L	0.50	0.10		W530275	STA	07/27/15 14:01	
EPA 200.8	Antimony	< 0.00019	mg/L	0.00300	0.00019		W531033	KWH	07/28/15 11:14	U
EPA 200.8	**Arsenic**	0.00598	mg/L	0.00300	0.00027		W531033	KWH	07/28/15 11:14	
EPA 200.8	**Barium**	0.0894	mg/L	0.00100	0.000099		W531033	KWH	07/28/15 11:14	
EPA 200.8	Beryllium	< 0.000048	mg/L	0.00020	0.000048		W531033	KWH	07/28/15 11:14	U
EPA 200.8	Cadmium	< 0.000072	mg/L	0.00020	0.000072		W531033	KWH	07/28/15 11:14	U
EPA 200.8	**Chromium**	0.0047	mg/L	0.0015	0.0004		W531033	KWH	07/28/15 11:14	
EPA 200.8	**Copper**	0.0184	mg/L	0.00100	0.00015		W531033	KWH	07/28/15 11:14	
EPA 200.8	Lead	< 0.000031	mg/L	0.00300	0.000031		W531033	KWH	07/28/15 11:14	U
EPA 200.8	**Manganese**	0.000416	mg/L	0.00100	0.000025		W531033	KWH	07/28/15 11:14	J
EPA 200.8	**Nickel**	0.0038	mg/L	0.0010	0.0004		W531033	KWH	07/28/15 11:14	
EPA 200.8	**Selenium**	0.0076	mg/L	0.0030	0.0006		W531033	KWH	07/28/15 11:14	
EPA 200.8	Silver	< 0.000021	mg/L	0.000100	0.000021		W531033	KWH	07/28/15 11:14	U
EPA 200.8	Thallium	< 0.000026	mg/L	0.00100	0.000026		W531033	KWH	07/28/15 11:14	U
EPA 200.8	**Zinc**	0.0113	mg/L	0.0050	0.0010		W531033	KWH	07/28/15 11:14	
Metals (Filtered)										
EPA 245.1	Mercury	< 0.00004	mg/L	0.00020	0.00004		W531134	DB	07/31/15 14:20	U
Classical Chemistry Parameters										
EPA 353.2	**Nitrate/Nitrite as N**	1.47	mg/L	0.050	0.017		W531009	BAG	07/28/15 12:36	
SM 2320B	**Total Alkalinity**	109	mg/L as CaCO3	1.0			W530270	DKS	07/27/15 11:37	
SM 2320B	**Bicarbonate**	109	mg/L as CaCO3	1.0			W530270	DKS	07/27/15 11:37	
SM 2320B	Carbonate	< 1.0	mg/L as CaCO3	1.0			W530270	DKS	07/27/15 11:37	
SM 2540 C	**Total Diss. Solids**	505	mg/L	10			W531062	RS	07/28/15 12:30	
SM 4500 H B	**pH @20.0°C**	7.93	pH Units				W530270	DKS	07/27/15 11:37	H3
Anions by Ion Chromatography										
EPA 300.0	**Chloride**	73.9	mg/L	2.00	0.56	10	W531059	DT	07/27/15 19:41	D2,M3
EPA 300.0	**Fluoride**	0.710	mg/L	0.100	0.022		W531059	DT	07/28/15 15:56	
EPA 300.0	**Sulfate as SO4**	173	mg/L	3.00	0.50	10	W531059	DT	07/27/15 19:41	D2,M3

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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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0513**
Reported: 31-Jul-15 16:12

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Dissolved)								
EPA 200.7	Aluminum	mg/L	<0.04	0.04	0.08	W530275	27-Jul-15	U
EPA 200.7	Calcium	mg/L	<0.058	0.058	0.100	W530275	27-Jul-15	U
EPA 200.7	Iron	mg/L	<0.048	0.048	0.060	W530275	27-Jul-15	U
EPA 200.7	Magnesium	mg/L	<0.11	0.11	0.20	W530275	27-Jul-15	U
EPA 200.7	Potassium	mg/L	<0.25	0.25	0.50	W530275	27-Jul-15	U
EPA 200.7	Sodium	mg/L	<0.10	0.10	0.50	W530275	27-Jul-15	U
EPA 200.8	Antimony	mg/L	<0.00019	0.00019	0.00300	W531033	28-Jul-15	U
EPA 200.8	Arsenic	mg/L	0.00033	0.00027	0.00300	W531033	28-Jul-15	J
EPA 200.8	Barium	mg/L	<0.000099	0.000099	0.00100	W531033	28-Jul-15	U
EPA 200.8	Beryllium	mg/L	<0.000048	0.000048	0.00020	W531033	28-Jul-15	U
EPA 200.8	Cadmium	mg/L	<0.000072	0.000072	0.00020	W531033	28-Jul-15	U
EPA 200.8	Chromium	mg/L	<0.0004	0.0004	0.0015	W531033	28-Jul-15	U
EPA 200.8	Copper	mg/L	<0.00015	0.00015	0.00100	W531033	28-Jul-15	U
EPA 200.8	Lead	mg/L	<0.000031	0.000031	0.00300	W531033	28-Jul-15	U
EPA 200.8	Manganese	mg/L	<0.000025	0.000025	0.00100	W531033	28-Jul-15	U
EPA 200.8	Nickel	mg/L	<0.0004	0.0004	0.0010	W531033	28-Jul-15	U
EPA 200.8	Selenium	mg/L	<0.0006	0.0006	0.0030	W531033	28-Jul-15	U
EPA 200.8	Silver	mg/L	<0.000021	0.000021	0.000100	W531033	28-Jul-15	U
EPA 200.8	Thallium	mg/L	<0.000026	0.000026	0.00100	W531033	28-Jul-15	U
EPA 200.8	Zinc	mg/L	<0.0010	0.0010	0.0050	W531033	28-Jul-15	U
Metals (Filtered)								
EPA 245.1	Mercury	mg/L	<0.00004	0.00004	0.00020	W531134	31-Jul-15	U
Classical Chemistry Parameters								
EPA 353.2	Nitrate/Nitrite as N	mg/L	<0.017	0.017	0.050	W531009	28-Jul-15	U
SM 2320B	Total Alkalinity	mg/L as CaCO3	<1.0		1.0	W530270	27-Jul-15	
SM 2320B	Bicarbonate	mg/L as CaCO3	<1.0		1.0	W530270	27-Jul-15	
SM 2320B	Carbonate	mg/L as CaCO3	<1.0		1.0	W530270	27-Jul-15	
SM 2540 C	Total Diss. Solids	mg/L	<10		10	W531062	28-Jul-15	
Anions by Ion Chromatography								
EPA 300.0	Chloride	mg/L	<0.06	0.06	0.20	W531059	27-Jul-15	U
EPA 300.0	Fluoride	mg/L	<0.022	0.022	0.100	W531059	27-Jul-15	U
EPA 300.0	Sulfate as SO4	mg/L	<0.05	0.05	0.30	W531059	27-Jul-15	U

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)									
EPA 200.7	Aluminum	mg/L	0.93	1.00	93.0	85 - 115	W530275	27-Jul-15	
EPA 200.7	Calcium	mg/L	18.7	20.0	93.7	85 - 115	W530275	27-Jul-15	
EPA 200.7	Iron	mg/L	9.24	10.0	92.4	85 - 115	W530275	27-Jul-15	
EPA 200.7	Magnesium	mg/L	18.5	20.0	92.5	85 - 115	W530275	27-Jul-15	
EPA 200.7	Potassium	mg/L	19.3	20.0	96.4	85 - 115	W530275	27-Jul-15	
EPA 200.7	Sodium	mg/L	17.8	19.0	93.6	85 - 115	W530275	27-Jul-15	
EPA 200.8	Antimony	mg/L	0.0260	0.0250	104	85 - 115	W531033	28-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0257	0.0250	103	85 - 115	W531033	28-Jul-15	
EPA 200.8	Barium	mg/L	0.0251	0.0250	100	85 - 115	W531033	28-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0247	0.0250	98.7	85 - 115	W531033	28-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0259	0.0250	103	85 - 115	W531033	28-Jul-15	
EPA 200.8	Chromium	mg/L	0.0252	0.0250	101	85 - 115	W531033	28-Jul-15	
EPA 200.8	Copper	mg/L	0.0250	0.0250	100	85 - 115	W531033	28-Jul-15	
EPA 200.8	Lead	mg/L	0.0241	0.0250	96.4	85 - 115	W531033	28-Jul-15	

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Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0513**
Reported: 31-Jul-15 16:12

Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved) (Continued)									
EPA 200.8	Manganese	mg/L	0.0252	0.0250	101	85 - 115	W531033	28-Jul-15	
EPA 200.8	Nickel	mg/L	0.0250	0.0250	99.9	85 - 115	W531033	28-Jul-15	
EPA 200.8	Selenium	mg/L	0.0267	0.0250	107	85 - 115	W531033	28-Jul-15	
EPA 200.8	Silver	mg/L	0.0262	0.0250	105	85 - 115	W531033	28-Jul-15	
EPA 200.8	Thallium	mg/L	0.0242	0.0250	96.9	85 - 115	W531033	28-Jul-15	
EPA 200.8	Zinc	mg/L	0.0258	0.0250	103	85 - 115	W531033	28-Jul-15	
Metals (Filtered)									
EPA 245.1	Mercury	mg/L	0.00504	0.00500	101	85 - 115	W531134	31-Jul-15	
Classical Chemistry Parameters									
EPA 353.2	Nitrate/Nitrite as N	mg/L	2.17	2.00	109	90 - 110	W531009	28-Jul-15	
SM 2320B	Total Alkalinity	mg/L as CaCO3	102	99.3	103	85 - 115	W530270	27-Jul-15	
SM 2320B	Bicarbonate	mg/L as CaCO3	102	99.3	103	85 - 115	W530270	27-Jul-15	
Anions by Ion Chromatography									
EPA 300.0	Chloride	mg/L	3.07	3.00	102	90 - 110	W531059	27-Jul-15	
EPA 300.0	Fluoride	mg/L	2.00	2.00	99.9	90 - 110	W531059	27-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	10.3	10.0	103	90 - 110	W531059	27-Jul-15	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters									
SM 2320B	Total Alkalinity	mg/L as CaCO3	145	142	1.8	20	W530270	27-Jul-15	
SM 2320B	Bicarbonate	mg/L as CaCO3	132	142	7.1	20	W530270	27-Jul-15	
SM 2320B	Carbonate	mg/L as CaCO3	12.3	<1.0	<RL	20	W530270	27-Jul-15	R2B
SM 2540 C	Total Diss. Solids	mg/L	252	262	3.9	10	W531062	28-Jul-15	
SM 2540 C	Total Diss. Solids	mg/L	503	505	0.4	10	W531062	28-Jul-15	
SM 4500 H B	pH	pH Units	8.59	7.81	9.5	20	W530270	27-Jul-15	R1B

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved)										
EPA 200.7	Aluminum	mg/L	0.96	<0.036	1.00	96.1	70 - 130	W530275	27-Jul-15	
EPA 200.7	Aluminum	mg/L	0.97	<0.036	1.00	96.8	70 - 130	W530275	27-Jul-15	
EPA 200.7	Calcium	mg/L	79.7	61.5	20.0	91.0	70 - 130	W530275	27-Jul-15	
EPA 200.7	Calcium	mg/L	505	497	20.0	R > 4S	70 - 130	W530275	27-Jul-15	M3
EPA 200.7	Iron	mg/L	9.39	<0.048	10.0	93.9	70 - 130	W530275	27-Jul-15	
EPA 200.7	Iron	mg/L	20.6	11.4	10.0	92.4	70 - 130	W530275	27-Jul-15	
EPA 200.7	Magnesium	mg/L	24.9	6.32	20.0	92.7	70 - 130	W530275	27-Jul-15	
EPA 200.7	Magnesium	mg/L	121	106	20.0	78.8	70 - 130	W530275	27-Jul-15	M3
EPA 200.7	Potassium	mg/L	21.5	1.78	20.0	98.4	70 - 130	W530275	27-Jul-15	
EPA 200.7	Potassium	mg/L	27.3	6.51	20.0	104	70 - 130	W530275	27-Jul-15	
EPA 200.7	Sodium	mg/L	38.2	20.1	19.0	95.6	70 - 130	W530275	27-Jul-15	
EPA 200.7	Sodium	mg/L	78.0	60.7	19.0	90.9	70 - 130	W530275	27-Jul-15	
EPA 200.8	Antimony	mg/L	0.0265	<0.00019	0.0250	106	70 - 130	W531033	28-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0347	0.00483	0.0250	119	70 - 130	W531033	28-Jul-15	
EPA 200.8	Barium	mg/L	0.0558	0.0303	0.0250	102	70 - 130	W531033	28-Jul-15	

SVL holds the following certifications:
AZ:0538, **CA**:2080, **ID**:ID00019 & ID00965 (Microbiology), **NV**:ID000192007A, **UT**(**TNI**):ID000192015-1, **WA**:C573

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0513**
Reported: 31-Jul-15 16:12

Quality Control - MATRIX SPIKE Data (Continued)

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Dissolved) (Continued)										
EPA 200.8	Beryllium	mg/L	0.0266	<0.000048	0.0250	106	70 - 130	W531033	28-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0268	<0.000072	0.0250	107	70 - 130	W531033	28-Jul-15	
EPA 200.8	Chromium	mg/L	0.0350	0.0092	0.0250	103	70 - 130	W531033	28-Jul-15	
EPA 200.8	Copper	mg/L	0.0263	0.00136	0.0250	99.9	70 - 130	W531033	28-Jul-15	
EPA 200.8	Lead	mg/L	0.0245	0.00102	0.0250	93.9	70 - 130	W531033	28-Jul-15	
EPA 200.8	Manganese	mg/L	0.0264	0.000952	0.0250	102	70 - 130	W531033	28-Jul-15	
EPA 200.8	Nickel	mg/L	0.0261	0.0009	0.0250	101	70 - 130	W531033	28-Jul-15	
EPA 200.8	Selenium	mg/L	0.0353	0.0013	0.0250	136	70 - 130	W531033	28-Jul-15	M1
EPA 200.8	Silver	mg/L	0.0258	<0.000021	0.0250	103	70 - 130	W531033	28-Jul-15	
EPA 200.8	Thallium	mg/L	0.0240	<0.000026	0.0250	95.8	70 - 130	W531033	28-Jul-15	
EPA 200.8	Zinc	mg/L	0.0343	0.0061	0.0250	113	70 - 130	W531033	28-Jul-15	
Metals (Filtered)										
EPA 245.1	Mercury	mg/L	0.00113	0.000041	0.00100	109	70 - 130	W531134	31-Jul-15	
EPA 245.1	Mercury	mg/L	0.00101	<0.00004	0.00100	101	70 - 130	W531134	31-Jul-15	
Classical Chemistry Parameters										
EPA 353.2	Nitrate/Nitrite as N	mg/L	3.24	0.978	2.00	113	90 - 110	W531009	28-Jul-15	M1
EPA 353.2	Nitrate/Nitrite as N	mg/L	2.38	<0.017	2.00	119	90 - 110	W531009	28-Jul-15	M1
Anions by Ion Chromatography										
EPA 300.0	Chloride	mg/L	73.8	73.9	3.00	R > 4S	90 - 110	W531059	27-Jul-15	D2,M3
EPA 300.0	Fluoride	mg/L	2.85	0.710	2.00	107	90 - 110	W531059	28-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	181	173	10.0	R > 4S	90 - 110	W531059	27-Jul-15	D2,M3

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	%R	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Dissolved)											
EPA 200.7	Aluminum	mg/L	0.96	0.96	1.00	96.2	0.2	20	W530275	27-Jul-15	
EPA 200.7	Calcium	mg/L	79.5	79.7	20.0	89.8	0.3	20	W530275	27-Jul-15	
EPA 200.7	Iron	mg/L	9.34	9.39	10.0	93.4	0.5	20	W530275	27-Jul-15	
EPA 200.7	Magnesium	mg/L	24.7	24.9	20.0	91.9	0.7	20	W530275	27-Jul-15	
EPA 200.7	Potassium	mg/L	21.3	21.5	20.0	97.8	0.6	20	W530275	27-Jul-15	
EPA 200.7	Sodium	mg/L	37.9	38.2	19.0	93.9	0.8	20	W530275	27-Jul-15	
EPA 200.8	Antimony	mg/L	0.0269	0.0265	0.0250	108	1.6	20	W531033	28-Jul-15	
EPA 200.8	Arsenic	mg/L	0.0357	0.0347	0.0250	123	2.9	20	W531033	28-Jul-15	
EPA 200.8	Barium	mg/L	0.0558	0.0558	0.0250	102	0.0	20	W531033	28-Jul-15	
EPA 200.8	Beryllium	mg/L	0.0269	0.0266	0.0250	108	1.1	20	W531033	28-Jul-15	
EPA 200.8	Cadmium	mg/L	0.0272	0.0268	0.0250	109	1.2	20	W531033	28-Jul-15	
EPA 200.8	Chromium	mg/L	0.0347	0.0350	0.0250	102	1.0	20	W531033	28-Jul-15	
EPA 200.8	Copper	mg/L	0.0265	0.0263	0.0250	101	0.8	20	W531033	28-Jul-15	
EPA 200.8	Lead	mg/L	0.0240	0.0245	0.0250	92.1	1.9	20	W531033	28-Jul-15	
EPA 200.8	Manganese	mg/L	0.0264	0.0264	0.0250	102	0.3	20	W531033	28-Jul-15	
EPA 200.8	Nickel	mg/L	0.0256	0.0261	0.0250	98.7	2.1	20	W531033	28-Jul-15	
EPA 200.8	Selenium	mg/L	0.0354	0.0353	0.0250	136	0.4	20	W531033	28-Jul-15	M1
EPA 200.8	Silver	mg/L	0.0256	0.0258	0.0250	103	0.6	20	W531033	28-Jul-15	
EPA 200.8	Thallium	mg/L	0.0234	0.0240	0.0250	93.6	2.3	20	W531033	28-Jul-15	
EPA 200.8	Zinc	mg/L	0.0358	0.0343	0.0250	119	4.2	20	W531033	28-Jul-15	
Metals (Filtered)											
EPA 245.1	Mercury	mg/L	0.00103	0.00113	0.00100	98.9	9.4	20	W531134	31-Jul-15	

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Excelsior Mining Corp.
2999 N. 44th St. #300
Phoenix, AZ 85018

Project Name: Gunnison Copper 2015
Work Order: **W5G0513**
Reported: 31-Jul-15 16:12

Quality Control - MATRIX SPIKE DUPLICATE Data (Continued)

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	%R	RPD	RPD Limit	Batch ID	Analyzed	Notes
Classical Chemistry Parameters											
EPA 353.2	Nitrate/Nitrite as N	mg/L	3.27	3.24	2.00	115	1.0	20	W531009	28-Jul-15	M1
Anions by Ion Chromatography											
EPA 300.0	Chloride	mg/L	73.6	73.8	3.00	R > 4S	0.3	20	W531059	27-Jul-15	D2,M3
EPA 300.0	Fluoride	mg/L	2.78	2.85	2.00	103	2.5	20	W531059	28-Jul-15	
EPA 300.0	Sulfate as SO4	mg/L	180	181	10.0	R > 4S	0.3	20	W531059	27-Jul-15	D2,M3

Notes and Definitions

D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of target analyte.
H3	Sample was received and/or analysis requested past holding time.
J	The reported value is less than the Reporting Limit (MRL, CRDL) but greater than or equal to the MDL. Results closer to the MDL have increased relative uncertainty.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
R1B	RPD exceeded the method acceptance limit.
R2B	RPD exceeded the laboratory acceptance limit.
U	Less than MDL.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable