

Spring 2013 Biannual Removal Action Monitoring Report
Blue Ledge Mine Site
Rogue River-Siskiyou National Forest
Siskiyou County, California

June 2013

ERRG Project No. 2010-084

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Prepared by:

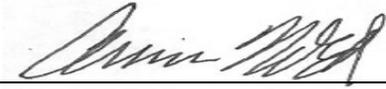


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Siskiyou County, California**

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Table of Contents

SECTION 1. INTRODUCTION	1-1
1.1. Site Background	1-1
1.2. Report Organization	1-2
SECTION 2. SAMPLE COLLECTION AND ANALYSIS	2-1
2.1. Drinking Water Samples	2-1
2.2. Surface Water Samples	2-3
2.3. Creek Sediment Samples	2-4
2.4. Fish Tissue Samples	2-5
2.5. Aquatic Macroinvertebrate Samples	2-5
2.6. Leachate Collection Sump Samples	2-6
2.7. Treatment Basins Sediment Samples	2-6
SECTION 3. RESULTS	3-1
3.1. Drinking Water	3-1
3.2. Surface Water	3-2
3.3. Creek Sediment	3-4
SECTION 4. DATA QUALITY ANALYSIS	4-1
4.1. Field Duplicates	4-1
4.2. Laboratory Quality Assurance and Quality Control	4-1
SECTION 5. CONCLUSIONS	5-1
5.1. Drinking Water	5-1
5.2. Surface Water	5-2
5.3. Creek Sediment	5-2
SECTION 6. REFERENCES.....	6-1

List of Figures

- Figure 1. Site Location and Vicinity Map
Figure 2. Overall Site Plan
Figure 3. Sampling Locations

List of Tables

- Table 1. Summary of Sampling Frequencies
Table 2. Drinking Water Analytical Data
Table 3. Surface (Creek) Water Analytical Data
Table 4. Creek Sediment Analytical Data
Table 5. Fish Species Sample Data
Table 6. Fish Tissue Analytical Data
Table 7. Aquatic Macroinvertebrate Analytical Data
Table 8. Leachate Analytical Data
Table 9. Sediment Basin Analytical Data
Table 10. Relative Percent Difference Results

List of Appendices

- Appendix A. Concentration Trend Graphs
Appendix B. Spring 2013 Laboratory Analytical Reports
Appendix C. Spring 2013 Biannual Monitoring Field Notes

Abbreviations and Acronyms

AMD	acid mine drainage
ASTM	ASTM International
Biannual Report	Biannual Removal Action Monitoring Report
CaCO ₃	calcium carbonate
CCC	continuous concentration criteria
DO	dissolved oxygen
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
ERRG	Engineering/Remediation Resources Group, Inc.
Forest Service	U.S. Department of Agriculture Forest Service
LCS	laboratory control samples
LCSD	LCS duplicates
MCLs	maximum contaminant levels
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mS/cm	milliSiemens per centimeter
MS/MSD	matrix spike/matrix spike duplicate
NRWQC	National Recommended Water Quality Criteria
NTCRA	non-time-critical removal action
O&M	operation and maintenance
QA	quality assurance
QAP/OMP	Quality Assurance Plan/Operations and Maintenance Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
RSLs	regional screening levels
SI	Site Inspection
SM	Standard Method

Abbreviations and Acronyms *(continued)*

TDS	total dissolved solids
TSS	total suspended solids
URS	URS Corporation
WRPs	waste rock piles
µg/L	micrograms per liter

Section 1. Introduction

Engineering/Remediation Resources Group, Inc. (ERRG) has prepared this Spring 2013 Biannual Removal Action Monitoring Report (Biannual Report) to document the results of biannual monitoring at the Blue Ledge Mine Site, in the Rogue River-Siskiyou National Forest, Siskiyou County, California (Figure 1). The non-time-critical removal action (NTCRA) was completed during two work seasons beginning on June 28, 2010, and ending on November 11, 2011. ERRG is conducting post-removal action monitoring events as part of operation and maintenance (O&M) activities under U.S. Department of Agriculture Forest Service (Forest Service) Contract No. GS-10F-0294R, Delivery Order No. AG-0489-D-10-0126. The purpose of the post-removal action monitoring is to document environmental conditions at the Blue Ledge Mine Site to ensure the effectiveness of the NTCRA to achieve unrestricted reuse of the site.

The Blue Ledge Mine Quality Assurance Plan/Operations and Maintenance Plan (QAP/OMP) provides the framework and procedures for sampling and analysis and serves as the primary guide for integrating quality assurance (QA) and quality control (QC) procedures. As outlined in the QAP/OMP, post-removal action monitoring includes:

- **Biannual monitoring** (fall and spring), which includes collection and analysis of drinking water samples, surface water samples, and creek sediment samples.
- **Annual monitoring** (fall), which includes collection and analysis of fish tissue samples and aquatic macroinvertebrate samples.
- **Waste characterization monitoring**, which includes collection and analysis of sediment samples from the treatment basins and the leachate samples. This monitoring was conducted during spring 2013 and will continue as-needed.

Biannual monitoring was performed on May 1 and 2, 2013 (spring 2013). Table 1 presents the sample type, number of sample locations, and frequency of sample collection for the spring 2013 event and future monitoring events. Data for all monitoring events are presented in Tables 2 through 9 for evaluation and comparison with the spring 2013 data.

1.1. SITE BACKGROUND

The Blue Ledge Mine Site is an abandoned copper mine. It is located on patented and National Forest System lands in northern California, within the Rogue River-Siskiyou National Forest, approximately 3 miles south of the Oregon border (Figure 1). The approximate geographic coordinates of the mine are N 41° 57' 36" latitude, W 123° 05' 60" longitude.

The Blue Ledge Mine was discovered in 1898, and was active from 1904 until approximately 1930. At least five productive mine adits and several prospect adits were constructed as part of the mining operation. Copper, zinc, silver, and gold ores were extracted from sulfide deposits and reportedly shipped from the site to the nearby historic town of Copper (now submerged beneath the Applegate Reservoir), and then to a former smelter in Tacoma, Washington. Sulfide-rich waste rock was discarded on the hillsides below the adits, forming four waste rock piles (WRPs) (WRP-1 through WRP-4) (URS Corporation [URS], 2010b).

WRP-1 through WRP-4 covered an area of approximately 7.2 acres. The WRPs were located on steep slopes at the upper headwaters of the Joe Creek watershed (Figure 2). Joe Creek flows north to Elliott Creek, a tributary to the Middle Fork of the Applegate River. The Applegate River feeds the Applegate Reservoir. The small community of Joe Bar, California, is located downstream of the site just downstream of the confluence of Joe Creek with Elliott Creek. Over time, the waste rock eroded and leached acidity and metals to Joe Creek and Elliott Creek and locations downstream. The acidity and the dissolved metals in acid mine drainage (AMD) are harmful to aquatic and terrestrial natural resources and potentially harmful to humans (URS, 2010b).

Since 1981, a number of environmental investigations have been performed at the Blue Ledge Mine Site. Results of those investigations showed that AMD from the site had impacted surface water, stream sediments, and groundwater downgradient from the site. Results of those investigations also showed that cadmium, copper, iron, lead, and zinc were present in soil, groundwater, surface water, and sediment at concentrations that could pose a risk to humans and wildlife. During cleanup activities performed prior to the 2010–2011 NTCRA conducted by ERRG, approximately the lower 25 percent of WRP-1 was terraced and regraded to direct AMD to a drainage channel lined with limestone boulders. The goal was to stabilize the slope, reduce erosion, and passively treat the AMD. The remediation work did not significantly reduce concentrations of metals or increase the pH of AMD flowing into Joe Creek. An estimated 70,000 tons of waste rock also remained in the four WRPs at the site (URS, 2010b). During the 2010–2011 NTCRA, waste rock was moved from all four WRPs to a permanent, lined waste repository that was constructed with an impermeable cap. The objective of the NTCRA was to eliminate the exposure pathway from waste rock to humans and wildlife to achieve unrestricted reuse of the site. Annual and biannual sampling is being performed until 2015 (ERRG, 2012) to confirm the effectiveness of the response action in achieving unrestricted reuse.

1.2. REPORT ORGANIZATION

The remainder of this report is organized as follows:

- [Section 2](#) summarizes sampling activities conducted during the spring 2013 biannual monitoring event.
- [Section 3](#) summarizes the results of the spring 2013 biannual monitoring event.

- [Section 4](#) summarizes the data quality analysis.
- [Section 5](#) provides conclusions based on the results of the spring 2013 biannual monitoring event.
- [Section 6](#) lists the documents and guidance used to prepare this report.

Figures and tables are presented following Section 6. This report also contains the following appendices:

- [Appendix A](#), Concentration Trend Graphs
- [Appendix B](#), Spring 2013 Laboratory Analytical Reports
- [Appendix C](#), Spring 2013 Biannual Monitoring Field Notes

Section 2. Sample Collection and Analysis

This section summarizes the methods used to collect and analyze samples during the spring 2013 biannual monitoring event conducted on May 1 and 2, 2013. Samples were collected of drinking water, surface water, and creek sediment. Fish tissue and macro invertebrates samples are collected annually in the fall and were not collected during this event. The samples collected for this sampling event were submitted to Apex Laboratory, LLC located in Tigard, Oregon, for analysis.

As discussed in [Section 1](#), sampling and analysis was conducted in accordance with the QAP/OMP ([URS, 2010a](#)). Please refer to the QAP/OMP for additional information on standard operating procedures, including decontamination, sample documentation, sample handling, and QC for sampling and analysis.

2.1. DRINKING WATER SAMPLES

As specified in the QAP/OMP ([URS, 2010a](#)), sample locations were selected upstream and downstream of the site near locations previously sampled during the site inspection (SI) ([URS, 2009](#)). Based on the criteria established in the QAP/OMP, drinking water samples were scheduled to be collected from the following five residences in Joe Bar, California ([Figure 3](#)):

- 462 (Bridgett's residence – creek source)
- 541 (Johan's residence – creek source)
- 12620 (Ron James' residence – well source)
- 12620 (Ron James' residence – irrigation well; well is not used for drinking water)
- 17607 (Luke's residence – well source)

Sample location 461 (Bob's residence) was eliminated from the O&M plan and replaced with the 12620 irrigation well location at the request of Pete Jones, project On-Scene Coordinator of the Forest Service. The spring source piping at sample location 461 (Bob's residence) was damaged in June 2010. The cabin does not currently have a water supply and there are no plans to replace the water supply during the O&M period. ERRG collected drinking water samples from residences 462, 541, 12620 (residence and irrigation), and 17607 during spring 2013.

In accordance with the QAP/OMP ([URS, 2010a](#)), each drinking water source was analyzed for alkalinity, sulfate, hardness, total dissolved solids (TDS), total suspended solids (TSS), and pH. A matrix

spike/matrix spike duplicate (MS/MSD) sample (location 541) and a field duplicate sample (location 17607) were also collected.

Prior to collecting drinking water samples, the tap and water line were flushed for 3 to 5 minutes. The irrigation well at Ron James' residence was flushed for a total of 10 minutes as requested by Pete Jones, Forest Service On-Scene Coordinator, because the source had not been used for an extended amount of time. Following flushing, sample containers were filled directly from the tap. Field parameters (pH, temperature, and specific conductivity) were measured using an electronic water quality meter that was calibrated prior to use. [Table 2](#) summarizes the field parameters.

Samples for offsite laboratory analysis were collected directly into appropriate laboratory-prepared sample containers provided by Apex Laboratory, LLC of Tigard, Oregon. Similar to the spring and fall 2012 biannual monitoring events, unfiltered samples were collected. Samples were intended to be filtered in the field (i.e., by gravity draining the samples through a 0.45-micron filter); however, field filtering required as much as 90 minutes per sample and was an inconvenience to residents. After consultation with the laboratory, it was determined that laboratory filtration would be acceptable provided unpreserved samples containers were used.

Sample containers were labeled with the appropriate sample identification number, project number, time, and date. Sample containers were then placed in a cooler with ice for transportation to the laboratory for filtration and analysis. Samples were prepared for shipping in accordance with ASTM International (ASTM) D 4840 chain-of-custody protocols ([ASTM, 1999](#)).

The laboratory analyzed the drinking water samples using the following analytical methods in accordance with the QAP/OMP ([URS, 2010a](#)):

- Dissolved metals (arsenic, cadmium, calcium, copper, iron, lead, magnesium, and zinc) by U.S. Environmental Protection Agency (EPA) Method 6020
- Alkalinity by Standard Method (SM) 2320B
- Sulfate by EPA Method 300.0
- Hardness by EPA Method 6020
- TDS by SM 2540C
- TSS by SM 2540D

[Table 2](#) summarizes the analytical results for the drinking water samples collected for the spring 2013 biannual monitoring event. Calcium and magnesium are considered essential nutrients and as such were not included in the summary tables or data analysis. [Table 2](#) also presents results from the previous drinking water sampling events for comparison. [Appendix A](#) provides the graphs containing concentration trends

over time. [Appendix B](#) provides the complete laboratory analytical reports for the spring 2013 biannual monitoring activities. [Appendix C](#) includes field notes from the spring 2013 biannual monitoring activities.

2.2. SURFACE WATER SAMPLES

As specified in the QAP/OMP ([URS, 2010a](#)), sample locations were selected in Elliott Creek, Joe Creek, and an unnamed tributary to Joe Creek. Based on the criteria established in the QAP/OMP, surface water samples were collected from the following six locations ([Figure 3](#)):

- EC-04 (Elliott Creek). Approximately 1,000 feet downstream from the Elliott Creek bridge, where Elliott Creek is adjacent to Forest Service Road 1050. Elliott Creek is most safely accessed from the private road along the south side of Elliott Creek that intersects Forest Service Road 1060 at the south end of the bridge crossing Elliott Creek. There is a ramp down to the creek for an irrigation pump. GPS location: 42.000584, -123.133272.
- EC-06 (Elliott Creek). Approximately 70 feet upstream from the confluence with Joe Creek. GPS location: 41.998232, -123.127425.
- JC-01 (Joe Creek). Approximately 100 feet upstream from the Joe Creek bridge on Forest Service Road 1060. GPS location: 41.998048, -123.128053.
- JC-08 (Joe Creek). Approximately 200 feet downstream from the confluence of Sediment Basin 1A and Joe Creek. GPS location: 41.962802, -123.106136.
- JC-09 (Joe Creek). In the riprap toe at the outlet of Sediment Basin 1A and the confluence of Joe Creek. GPS location: 41.962331, -123.105777. During the spring 2013 sampling event, this sample location was moved approximately 30 yards downstream because high water conditions of the season prevented safe access to the typical sample location.
- JC-10 (unnamed tributary to Joe Creek). Approximately 300 feet upstream of the mine site access road crossing Joe Creek where it intersects Forest Service Road 1060. GPS location: 41.961879, -123.103852.

Each of these locations, except JC-09, is marked in the field with paint on a nearby tree or rock surface and with flagging and a metal identification tag fastened to a nearby tree.

In accordance with the QAP/OMP ([URS, 2010a](#)), each surface water sample was analyzed for alkalinity, sulfate, hardness, TDS, TSS, and dissolved metals. An MS/MSD sample (location JC-10) and a field duplicate sample (location JC-08) were collected for QC purposes in accordance with Section 5.0 of the QAP/OMP ([URS, 2010a](#)). Samples were obtained during the spring 2013 biannual monitoring event from previously identified and marked locations, except where noted above. At each location, surface water field parameters (pH, temperature, and specific conductivity) were measured using an electronic water quality field meter.

During sample collection, field personnel stood out of the water or downstream of the location to be sampled to ensure that the sample reflected undisturbed creek conditions. Unfiltered samples were

collected from the side of the creek channels in the flowing water column by submerging the sampling container into the creek and allowing it to fill with creek water. The samples were collected into appropriate laboratory-prepared sample containers. The sample containers were labeled with the appropriate sample identification number, project number, time, and date. Sample containers were then placed in a cooler with ice for transportation to the laboratory for filtering and analysis. Samples were prepared for shipping in accordance with ASTM D 4840 chain-of-custody protocols (ASTM, 1999).

The surface water samples were analyzed using the following analytical methods in accordance with the QAP/OMP:

- Dissolved metals (arsenic, cadmium, calcium, copper, iron, lead, magnesium, and zinc) by EPA Method 6020
- Alkalinity by SM 2320B
- Sulfate by EPA Method 300.0
- Hardness by EPA Method 6020
- TDS by SM 2540C
- TSS by SM 2540D

Table 3 summarizes the analytical results for surface water samples collected during the spring 2013 biannual monitoring event and includes data from previous sampling events for comparison. Appendix A provides the graphs containing concentration trends over time. Appendix B provides the complete laboratory analytical reports. Appendix C includes field notes.

2.3. CREEK SEDIMENT SAMPLES

As specified in the QAP/OMP (URS, 2010a), creek sediment samples were collected at the same locations as the surface water samples collected in Elliott Creek, Joe Creek, and an unnamed tributary to Joe Creek from the following six locations (Figure 3):

- EC-04 (Elliott Creek)
- EC-06 (Elliott Creek)
- JC-01 (Joe Creek)
- JC-08 (Joe Creek)
- JC-09 (Joe Creek)
- JC-10 (unnamed tributary to Joe Creek)

In accordance with the QAP/OMP (URS, 2010a), each creek sediment sample was analyzed for metals (arsenic, cadmium, copper, iron, lead, and zinc), percent moisture, and grain size. An MS/MSD sample

(location JC-01) and a field duplicate sample (location JC-09) were collected for QC purposes in accordance with Section 5.0 of the QAP/OMP (URS, 2010a). Representative MS/MSD and duplicate sediment samples were collected by alternating aliquots of sediment from each scoop or shovel into the primary and MS/MSD or field duplicate sample containers.

Discrete samples were collected from each location. Samples were collected from the top 6 inches of sediment in the creek from previously identified and marked locations using dedicated, clean, disposable plastic scoops. Similar to the surface water samples discussed in Section 2.2, creek sediment sample location JC-09 was moved approximately 30 yards downstream because high water conditions of the season prevented safe access to the typical sample location. Each sample was placed into an appropriate laboratory-prepared sample container. Sample containers were labeled with the appropriate sample identification number, project number, time, and date and placed in a cooler with ice for transportation to the laboratory. Samples were prepared for shipping in accordance with ASTM D 4840 chain-of-custody protocols (ASTM, 1999).

The laboratory analyzed the creek sediment samples by the following analytical methods in accordance with the QAP/OMP:

- Metals (arsenic, cadmium, copper, iron, lead, and zinc) by EPA Method 6020
- Percent moisture by Apex Standard Operating Procedure
- Particle size by ASTM D422

Table 4 summarizes the analytical results for metals and includes data from previous sampling events for comparison. Appendix A provides the graphs containing concentration trends over time. Appendix B provides the complete laboratory analytical reports, particle size analysis, and percent moisture results. Appendix C includes field notes.

2.4. FISH TISSUE SAMPLES

Fish tissue samples are collected annually in the fall; therefore, fish tissue samples were not collected during the spring 2013 biannual monitoring event. The fish tissue samples will be collected during the fall 2013 biannual monitoring event in accordance with the annual sampling frequency protocol. Table 5 summarizes the species, size, and approximate age of the fish captured during previous sampling events. Table 6 summarizes the analytical results for fish tissue samples collected during previous sampling events, including the most recent event on October 16, 2012.

2.5. AQUATIC MACROINVERTEBRATE SAMPLES

Aquatic macroinvertebrate samples are collected annually in the fall; therefore, aquatic macroinvertebrate samples were not collected during the spring 2013 biannual monitoring event. Aquatic macroinvertebrate

samples will be collected during the fall 2013 biannual monitoring event in accordance with the annual sampling frequency protocol. [Table 7](#) summarizes the analytical results for aquatic macroinvertebrate samples collected during previous sampling events, including the most recent event on October 16, 2012.

2.6. LEACHATE COLLECTION SUMP SAMPLES

Leachate samples were collected from the leachate collection sump on May 1, 2013, and profiled for Resource Conservation and Recovery Act (RCRA) metals and pH by Apex Laboratory, LLC. Leachate will be disposed of during maintenance activities to be performed during late summer 2013. [Appendix B](#) includes the laboratory analytical reports. [Appendix C](#) includes field notes. [Table 8](#) summarizes the most recent results from the leachate sample collected.

The leachate collection sump at the repository is monitored periodically to determine if disposal of leachate is necessary during upcoming maintenance activities. Samples are collected as needed to profile the leachate for disposal.

2.7. TREATMENT BASINS SEDIMENT SAMPLES

Sediment samples were collected from the nine treatment basins on May 1, 2013, and submitted to Apex Laboratory, LLC for analysis of RCRA metals and pH. Laboratory analytical results indicated RCRA metal concentrations and pH were less than site cleanup goals, except for copper in treatment basin 3. Similar to spring 2012, copper was reported at a concentration of 1,640 milligrams per kilogram (mg/kg) which slightly exceeds the soil removal goal (including the 15% tolerance limit) of 1,197.15 mg/kg. Sediment will be removed from the treatment basins during site maintenance activities to be performed during late summer 2013. [Table 9](#) summarizes the results of the treatment basin sediment samples. [Appendix B](#) includes the laboratory analytical report.

Section 3. Results

This section summarizes the data collected during the spring 2013 biannual monitoring event, as well as the comparison of data from previous sampling events. As part of the data evaluation, data were screened against values from the Final SI Report (URS, 2009) and the Engineering Evaluation/Cost Analysis (EE/CA) (URS, 2010b), consistent with the removal action objectives and in compliance with applicable or relevant and appropriate requirements presented in the EE/CA. The screening criteria are included in Tables 2 through 4 and 6 through 9 for comparison purposes.

3.1. DRINKING WATER

Drinking water samples were collected as part of ongoing post-removal action monitoring. ERRG collected biannual drinking water samples from drinking water sources of residents of Joe Bar, California. Appendix B contains the laboratory analytical reports for the spring 2013 biannual monitoring event. Figure 3 shows the locations where the samples were collected, and Table 2 summarizes the sample results.

Samples were analyzed in the field for pH, conductivity, dissolved oxygen (DO), and temperature. Field parameter results for the spring 2013 biannual monitoring event are discussed below.

- Water temperature measurements ranged between 10.04°C and 11.08°C.
- Electrical conductivity measurements ranged between 0.271 and 0.355 milliSiemens per centimeter (mS/cm).
- DO concentrations ranged between 9.11 and 11.79 milligrams per liter (mg/L).
- pH measurements ranged between 6.86 and 7.59.
- Turbidity concentrations ranged from 27.7 to 60.0 nephelometric turbidity units.

Drinking water samples were analyzed for general chemistry parameters (total alkalinity, hardness, TDS, TSS, and sulfate). General chemistry results for the spring 2013 biannual monitoring event are discussed below.

- Total alkalinity as calcium carbonate (CaCO₃) ranged from 149 mg/L to 281 mg/L.
- Hardness as CaCO₃ ranged from 199 mg/L to 279 mg/L.
- TDS ranged from 211 mg/L to 299 mg/L.

- TSS was not detected at a concentration greater than the laboratory reporting limit of 5.0 mg/L.
- Sulfate concentrations ranged from 10.2 mg/L to 35.4 mg/L.

Samples were also analyzed for dissolved metals (arsenic, cadmium, calcium, copper, iron, lead, magnesium, and zinc). Drinking water results were compared with the following human health screening criteria for metals:

- EPA regional screening levels (RSLs) for tap water
- EPA maximum contaminant levels (MCLs)

RSLs are tools for evaluating and cleaning up contaminated EPA Superfund sites. RSLs are risk-based concentrations used for initial screening-level evaluations of environmental measurements to assist human health risk assessors. MCLs are the legal requirement for water companies to meet for serving water to the public. MCLs are developed by analyzing risk and what levels can be practically achieved. MCLs for arsenic are set considerably higher than RSLs because arsenic is commonly found in water systems at relatively high concentrations.

Dissolved metal results for the spring 2013 biannual monitoring event are discussed below.

- Arsenic results ranged from nondetect to 5.96 micrograms per liter ($\mu\text{g/L}$). Arsenic concentrations exceeded the EPA RSL (0.045 $\mu\text{g/L}$) in samples from three locations (462, 541, and 12620 [drinking water]); however, the concentrations were less than the EPA drinking water MCL of 10 $\mu\text{g/L}$ in all samples collected.
- Cadmium, copper, lead, and zinc concentrations in drinking water samples were less than their respective EPA RSLs and MCLs.
- Iron results ranged from 1,360 $\mu\text{g/L}$ to 2,170 $\mu\text{g/L}$. All iron results were less than EPA RSL for drinking water in all samples collected, but exceeded both the EPA MCL (300 $\mu\text{g/L}$) and the California MCL (300 $\mu\text{g/L}$).

[Table 2](#) summarizes the field parameter, general chemistry, and metals results for all sampling events from 2008 through spring 2013.

3.2. SURFACE WATER

ERRG collected surface water samples from Elliott Creek and Joe Creek during the spring 2013 biannual monitoring event. [Appendix B](#) contains the laboratory analytical report for the spring 2013 biannual monitoring event. [Figure 3](#) shows the locations where these samples were collected, and [Table 3](#) summarizes the sample results.

Samples were analyzed in the field for temperature, conductivity, and pH. Field parameter results for the spring 2013 biannual monitoring event are discussed below.

- Water temperature measurements ranged between 5.37°C and 6.42°C.
- Electrical conductivity measurements ranged between 0.041 and 0.083 mS/cm.
- pH measurements ranged between 7.24 and 8.00.

Surface water samples were analyzed for general chemistry parameters (total alkalinity, hardness, TDS, TSS, and sulfate). General chemistry results for the spring 2013 biannual monitoring event are discussed below.

- Total alkalinity as CaCO₃ ranged from nondetect to 40.0 mg/L.
- Hardness as CaCO₃ ranged from 20.8 mg/L to 42.5 mg/L.
- TDS ranged from nondetect to 40 mg/L.
- TSS concentrations ranged from nondetect to 7.00 mg/L.
- Sulfate concentrations ranged from 2.64 mg/L to 5.16 mg/L.

Samples were also analyzed for dissolved metals (arsenic, cadmium, calcium, copper, iron, lead, magnesium, and zinc). Surface water results were compared with the following screening criteria for metals:

- Ecological
 - California Water Quality Standards (continuous concentration criteria [CCC])
 - EPA National Recommended Water Quality Criteria (NRWQC) (CCC)
- Human health
 - California Water Quality Standards (humans ingesting organisms only)
 - EPA NRWQC (protective of humans ingesting organisms only)

* Note that no human health screening criteria have been established for cadmium, copper, iron, and lead.

Dissolved metal results for the spring 2013 biannual monitoring event are discussed below.

- Arsenic concentrations ranged from nondetect to 0.378 µg/L. Arsenic concentrations did not exceed ecological screening criteria in any of the samples collected. It should also be noted that if any human's drinking water system source is directly from the stream, the MCL for arsenic is 10 µg/L. Arsenic concentrations during spring 2013 were detected at concentrations lower than they were detected in spring 2012.
- Cadmium concentrations ranged from nondetect to 0.322 µg/L, with two concentrations (0.189 µg/L and 0.322 µg/L) exceeding the ecological screening criteria (0.13 µg/L or 0.25 µg/L) in samples collected from JC-08 and JC-01, respectively. Cadmium concentrations during spring 2013 were detected at concentrations either the same or lower than they were detected in spring 2012.

- Copper concentrations ranged from nondetect to 18.9 µg/L, with two concentrations (18.1 µg/L and 18.9 µg/L) exceedances of the ecological screening criterion (9.00 µg/L) in samples collected from JC-08 and JC-01. Copper concentrations during spring 2013 were detected at concentrations either the same or lower than they were detected in spring 2012 with the exception of one sample. This one sample was collected at JC-01 and was only slightly greater in spring 2013 than spring 2012 by 2.6 µg/L.
- The results for iron, lead, and zinc were less than the screening criteria.

Table 3 summarizes the field parameter, general chemistry, and metals results for all sampling events.

3.3. CREEK SEDIMENT

ERRG collected creek sediment samples during the spring 2013 biannual monitoring event. Appendix B contains the laboratory analytical report for the spring 2013 biannual monitoring event. Figure 3 shows the locations where these samples were collected and Table 4 summarizes the sample results.

Samples were analyzed for total metals (arsenic, cadmium, copper, iron, lead, and zinc). Creek sediment results were compared with the ecological and human health screening criteria originally presented in Table 5 of the Final SI Report (URS, 2009). The lowest of the ecological screening levels compared (threshold effect concentrations [TEC], probable effect concentrations [PEC], Oregon Department of Environmental Quality screening level values [SLV], Washington State sediment quality standards[SQS] and, background concentrations) was selected as the applicable ecological screening level. Applicable screening levels are listed below:

- Ecological
 - Arsenic: DEQ SLV
 - Cadmium: TECs
 - Copper: background concentration
 - Lead: DEQ SLVs
 - Zinc: TECs
 - Human health
 - EPA Region 6 Human Health Medium Specific Screening Levels
- * Note that no ecological or human health screening criteria has been established for iron.

Metal results for the spring 2013 biannual monitoring event are discussed below.

- Arsenic concentrations ranged from 2.56 mg/kg to 25.2 mg/kg with all six concentrations (2.56 mg/kg, 5.38 mg/kg [4.37 in duplicate sample], 5.65 mg/kg, 6.70 mg/kg, 9.69 mg/kg, 25.2 mg/kg) exceeding the human health screening criterion (1.5 mg/kg) in samples collected from JC-10, JC-01, EC-06, EC-04, JC-09, JC-08, respectively. Concentrations in sediment samples from two locations (JC-08 and JC-09) in Joe Creek also exceeded the ecological screening criterion (7 mg/kg).
- Cadmium concentrations ranged from 0.212 mg/kg to 2.85 mg/kg, with three concentrations (1.54 mg/kg, 2.32 mg/kg [2.40 mg/kg in the duplicate], 2.85 mg/kg) exceeding the ecological screening criterion (0.99 mg/kg) in sediment samples collected from JC-09, JC-01, and JC-08, respectively in Joe Creek. However the duplicate sample collected from JC-09 contained a detection of 0.686 µg/L which is below the ecological screening criteria. Cadmium concentrations did not exceed ecological screening criteria in sediment samples collected from Elliott Creek. Cadmium was not reported at concentrations exceeding the human health screening criterion in all sediment samples collected.
- Copper concentrations ranged from 39.2 mg/kg to 769 mg/kg, with five concentrations (50.5 mg/kg, 113 mg/kg, 222 mg/kg, 621 mg/kg [585 mg/kg in the duplicate], and 769 mg/kg) exceeding the ecological screening criterion (42.9 mg/kg) in sediment samples collected from four locations (JC-10, JC-09, JC-01, and JC-08, respectively) in Joe Creek and from one location (EC-04) in Elliott Creek. Copper concentrations did not exceed ecological screening criteria in the sample collected from location EC-06 in Elliott Creek. Copper was not reported at concentrations exceeding the human health screening criteria in all sediment samples collected.
- Iron concentrations ranged from 15,300 mg/kg to 29,000 mg/kg; however, no ecological or human health screening criteria have been established for iron in sediment.
- Lead concentrations ranged from 2.66 mg/kg to 75.9 mg/kg, with two concentrations (29.7 mg/kg and 75.9 mg/kg) exceeding the ecological screening criterion (17 mg/kg) in sediment samples collected from two locations (JC-09 and JC-08, respectively) in Joe Creek. Lead was not reported at concentrations exceeding the human health screening criterion in sediment samples collected from Joe Creek. Lead concentrations did not exceed ecological or human health screening criteria in sediment samples collected from Elliott Creek.
- Zinc concentrations ranged from 36.3 mg/kg to 602 mg/kg, with three concentrations (145 mg/kg, 420 mg/kg, 433 mg/kg [602 mg/kg in the duplicate]) exceeding the ecological screening criterion (121 mg/kg) in sediment samples collected from three locations (JC-09, JC-01, and JC-08, respectively) in Joe Creek. Zinc concentrations did not exceed the ecological screening screening criteria in the sediment samples collected from Elliott Creek. Zinc was not reported at concentrations exceeding the human health screening criteria in all sediment samples collected.

Section 4. Data Quality Analysis

Several QC samples, including three field duplicates (one each for drinking water, surface water, and creek sediment), were collected during the spring 2013 biannual monitoring event. In addition, laboratory QA/QC was performed by the criteria established by the EPA (EPA, 2010). QC samples were not collected for waste characterization samples.

4.1. FIELD DUPLICATES

A field duplicate sample was collected at a minimum for 10 percent of the samples collected. Field duplicate analysis primarily measures consistency of field sampling procedures; however, the results are also affected by precision of the laboratory operations. Field duplicate results were compared with the results of the parent sample, and values of the relative percent difference (RPD) were calculated using the following formula:

$$RPD=(A-B)/((A+B)/2) \times 100$$

where:

A = parent sample concentration

B = duplicate sample concentration

RPD results are presented in Table 10. If an analyte was not detected at a concentration greater than the laboratory control limit, half of the reporting limit was used for the RPD calculation.

The RPDs calculated for the duplicate pairs were all less than established control limits (<40 percent), except for alkalinity in duplicate pair BL-SW-JC08-050113 and BL-SW-JC08-050113DUP and cadmium and zinc in duplicate pair BL-CS-JC09-050113 and BL-CS-JC09-050113DUP. The RPD exceedances for these analytes can be attributed to the heterogeneous composition of soil and the data were deemed usable.

4.2. LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL

Laboratory QA and QC procedures were carried out in accordance with EPA protocols, and the data were accepted based on the QA/QC criteria established by the EPA (EPA, 2010). Laboratory QA/QC included method blanks, storage blanks, laboratory duplicates, laboratory control samples (LCS), LCS duplicates (LCSD), and MS/MSD samples. Laboratory QA/QC analysis is summarized below for sediment, surface water, and drinking water samples.

There were no laboratory blank detections for creek sediment, surface water or drinking water analysis.

MS/MSD samples were analyzed to evaluate matrix interferences in the associated sediment, surface water, and drinking water samples. Percent recoveries and/or RPD values for laboratory duplicates, LCS, and MS/MSD samples were within method-specified control limits for surface water and drinking water and the data are deemed usable.

Percent recoveries and/or RPD values for blank spikes, LCS/LCSD, and MS/MSD samples were within method-specified control limits for sediment analysis, except for the following:

- MS recoveries for copper, iron, and zinc in QC samples 3050237-MS1 and 305237-MSD1 due to high concentrations of analytes present in the sample.
- MS percent recoveries for copper and iron in QC sample 3050160-MS1 and MSD RPDs for copper in QC sample 3050160-DUP1 due to non-homogeneous sample matrix.
- MS percent recovery for lead in QC sample 3050160-MS2 for lead.
- MS percent recovery for zinc in QC sample 3050324-MS2.

However, the percent recoveries and RPDs of the associated LCS/LCSD samples were within laboratory control limits for all analytes were within laboratory control limits and the data are deemed usable.

Percent recoveries and/or RPD values for LCS/LCSD samples were within method-specified control limits for sediment analysis except for the RPD for arsenic in QC sample 3050237-DUP1. However, the percent recoveries and RPDs of the associated MS/MSD samples were within laboratory control limits for all analytes and the data are deemed usable. [Appendix B](#) contains the laboratory analytical reports.

Section 5. Conclusions

This Biannual Report evaluates the chemical concentrations reported in drinking water, surface water, and creek sediment during the period from the completion of the NTCRA to the spring 2013 biannual monitoring event. For reference, historical chemical data are also presented in [Tables 2 through 4](#) and [6 through 9](#).

5.1. DRINKING WATER

Concentrations of metals detected in drinking water, except for arsenic and iron, were less than the screening criteria. Dissolved arsenic concentrations exceeded the RSL of 0.045 µg/L in drinking water samples. Arsenic concentrations did not exceed the MCL of 10 µg/L in the drinking water samples collected. As stated in [Section 3.1](#), MCLs are the legal limits for concentrations in drinking water for the public and the MCL for arsenic is higher than RSL because arsenic is commonly found in water systems at relatively high concentrations. These results are consistent with the elevated concentrations of dissolved arsenic reported in drinking water samples collected during the SI ([URS, 2009](#)) and previous biannual monitoring events. Arsenic present in drinking water samples cannot be directly attributed to contamination at the site and may be the result of naturally occurring arsenic because arsenic occurs naturally in California bedrock at concentrations ranging from 0.6 to 11 mg/kg ([Bradford et. al, 1996](#)). Background sampling upgradient of the site, in an area not affected by site contamination, would be necessary to evaluate whether elevated arsenic concentrations in drinking water samples are a direct result of site contamination.

Concentrations of copper, cadmium, lead, and zinc indicate a stable trend over the monitoring period to date. However, a notable increase in iron concentrations was observed from June 2011 to May 2013 ([Appendix A](#)), with all results exceeding the MCLs ([Table 2](#)). Iron concentrations did not exceed the RSL of 11,000 µg/L in any of the drinking water samples collected. Iron concentrations will continue to be monitored and tracked.

Turbidity was significantly higher in all drinking water samples collected during May 2013, and turbidity readings collected during June 2010 were also significantly high. The elevated readings may be a result of increased runoff, which increases the turbidity. ERRG will continue to monitor drinking water during QAP/OMP activities and compare seasonal measurements. [Appendix A](#) provides the concentration trends for metals over time. Data from future biannual monitoring events will be added to the concentration trends to allow a complete evaluation of metals concentrations during the QAP/OMP period.

5.2. SURFACE WATER

Joe Creek starts upstream from the mine and flows through the mine area before entering Elliott Creek several miles downstream. The spring 2013 biannual monitoring surface water sample results showed the following:

- Elevated concentrations of arsenic have been historically present in Elliott Creek. However, none of the spring 2013 samples contained arsenic at concentrations exceeding the California Water Quality Standards or the EPA NRWQC (the ecological screening criteria). Water samples collected from Elliott Creek (EC-04 and EC-06) contained arsenic at concentrations exceeding the EPA NRWQC (protective of humans ingesting organisms) (the human health screening criterion). If elevated concentrations of arsenic are detected in samples from Joe Creek, it could be an indication that elevated concentrations are not a result of site contamination but reflect naturally occurring concentrations of arsenic.
- Cadmium concentrations in surface water samples collected from locations JC-01 and JC-08 in Joe Creek slightly exceeded the Ecological Screening Criterion (California Water Quality Standards). Concentrations of cadmium in the remaining samples from Joe Creek and all samples collected in Elliott Creek were less than the Ecological Screening Criterion (California Water Quality Standards).
- Copper concentrations in surface water samples collected from JC-01 and JC-08 in Joe Creek exceeded the Ecological Screening Criterion (EPA NRWQC).
- Zinc, iron, and lead concentrations were less than the Ecological Screening Criterion (California Water Quality Standards).

[Appendix A](#) provides the concentration trends for metals over time. Results less than the reporting limit are represented in [Appendix A](#) as one-half of the reporting limit. Concentrations for arsenic, cadmium, copper, lead, and zinc are generally consistent and do not show a clear trend over the time period recorded. Data from future monitoring events will be added to the concentration trends to allow for a complete evaluation of metals concentrations during the QAP/OMP period.

5.3. CREEK SEDIMENT

Except for arsenic, metals concentrations in creek sediment are generally higher in Joe Creek than in Elliott Creek, particularly in locations (JC-01, JC-08, and JC-09) downstream from the mine ([Table 4](#)). This observation is consistent with historical data (e.g., [URS, 2009](#)) and is likely because Joe Creek flows through the historically excavated portions of the mine area before entering Elliott Creek several miles downstream. Arsenic is detected at similar concentrations in both creeks, which could be an indication that these elevated concentrations are not solely the result of site contamination but reflect naturally occurring concentrations of arsenic.

Concentrations of metals in creek sediment samples were less than the human health screening criterion in all samples collected, except for arsenic. Concentrations of arsenic only slightly exceeded the human

health screening criterion, except in samples collected from locations JC-08 and JC-09 in Joe Creek. Additionally, arsenic concentrations in sediment samples collected from locations JC-08 and JC-09 exceeded the ecological screening criterion. Arsenic concentrations in creek sediment samples collected from location JC-09 are similar to those concentrations detected in creek sediment collected in fall 2011. Concentrations of arsenic in creek sediment have increased at location JC-08 since fall 2011, and concentrations of arsenic in creek sediment at location JC-10 have decreased significantly. The contribution of sediments to Joe Creek from the former WRPs is limited by the nine sediment collection and treatment basins, except for periods of very high runoff such as major storm events and spring snowmelt. Therefore, the variation in sample results may be the result of variations in the preexisting sediment as it is naturally and continuously deposited and eroded at each sample location between the time of each sample event. Arsenic concentrations in creek sediment will continue to be monitored to determine if a trend develops.

[Appendix A](#) provides the concentration trends for metals over time. The data are generally stable and do not show a clear increasing or decreasing trend over the time period recorded. Concentrations of five metals analyzed are lower in the creek sediment samples collected at locations JC-09 and JC-08 since fall 2012. Conversely, concentrations of five metals have either decreased or remained the same in the remaining sample locations since fall 2012. Additional data are needed from subsequent sampling events to compare concentrations during similar seasons to fully evaluate the significance of these changes in metal concentrations.

Analytical results for metals in creek sediment collected at location JC-10 during fall 2011 remain an anomaly. No other sediment samples have exhibited such high concentrations of metals, indicating it is unlikely a result of incorrectly labeling the sample name. Other sample results have been consistent at each location. Metals concentrations collected from JC-10 in spring 2013 are consistent with data collected in 2008. Another difference between the fall 2011 data and the spring 2011, spring 2012, fall 2012, and spring 2013 data for JC-10 is the greater percentage of fine grain sediment. The fall 2011 creek sediment sample collected at JC-10 contained 40 percent silt and 5 percent clay, while sediment samples collected in spring 2011, spring 2012, fall 2012, and spring 2013 contained between 1 and 5 percent silt and 0 to 1 percent clay. As more data is collected from subsequent sampling events, a trend over time may become evident. Data from future monitoring events will be added to the concentration trend plots to further evaluate metals concentrations at the site.

Section 6. References

ASTM International (ASTM), 1999. ASTM D 4840-99, “Standard Guide for Sample Chain-of-Custody Procedures.” December 10.

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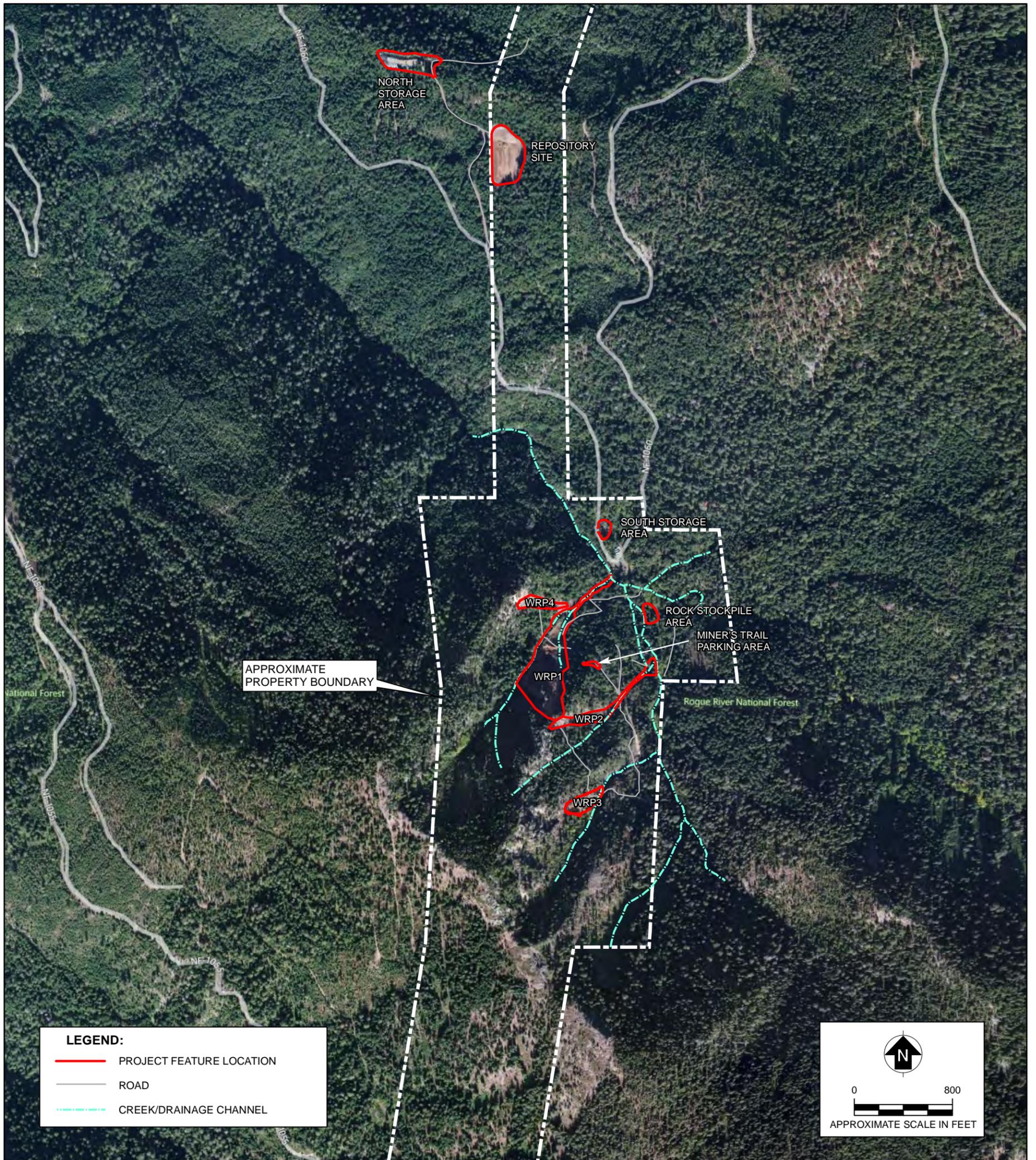
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Figures



LEGEND:

- PROJECT FEATURE LOCATION
- ROAD
- - - CREEK/DRAINAGE CHANNEL

APPROXIMATE SCALE IN FEET

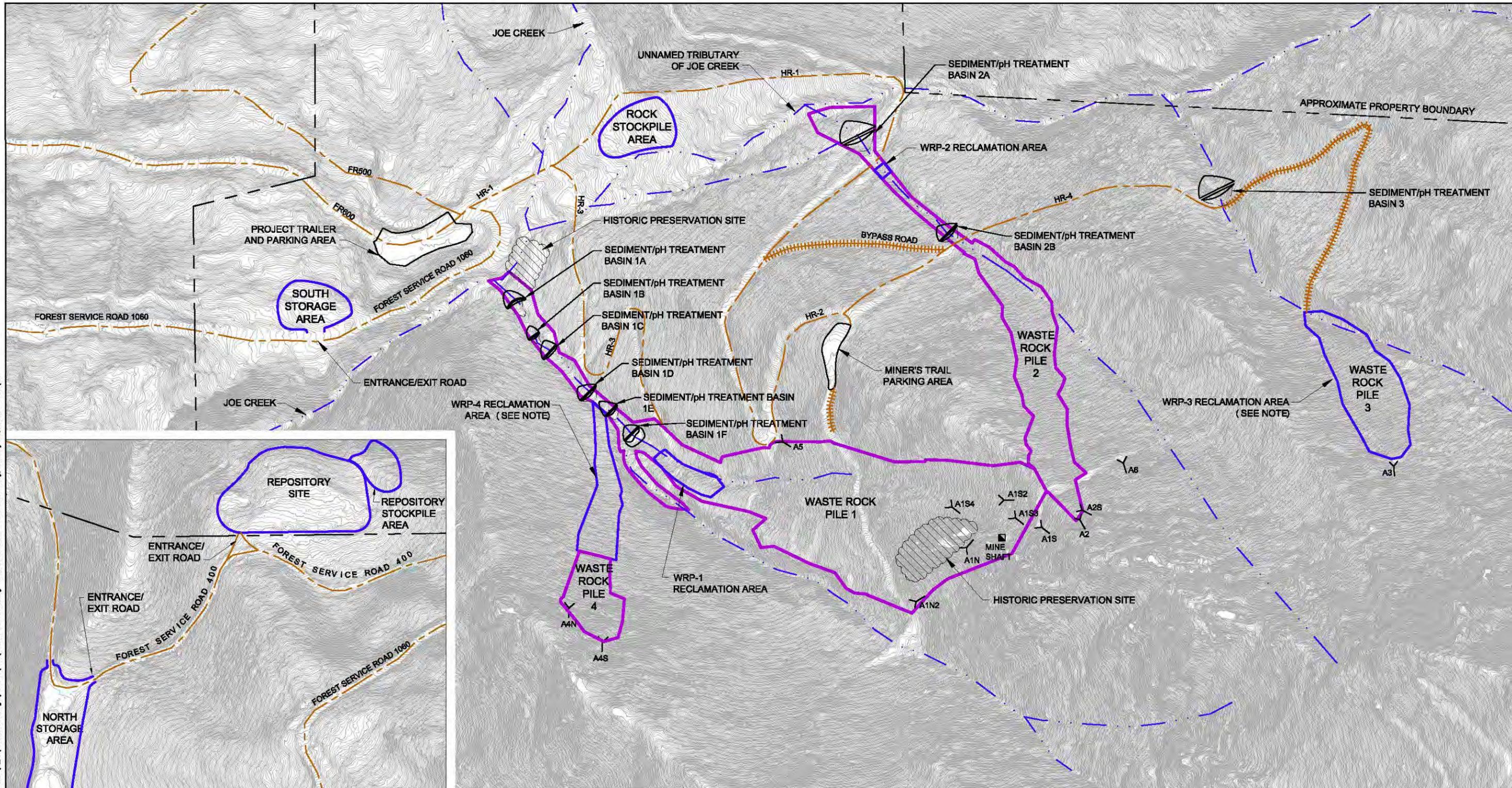
SOURCES: BING MAPS; URS CORPORATION



N:\graphics\2010\2010-084 USFS Blueledge_Mine\2011 GIS\Site_Vicinity_Map.mxd

 Engineering/Remediation Resources Group, Inc. 4585 Pacheco Blvd, Suite 200 Martinez, California 94553 (925) 969-0750	CLIENT: USDA FOREST SERVICE	SITE LOCATION AND VICINITY MAP			
	LOCATION: BLUE LEDGE MINE BLUE LEDGE, CALIFORNIA	DRAWN BY: JJC 6/14/2010	CHECKED BY: MS 6/14/2010	PROJECT NO. 2010-084	FIG NO. 1

FILE NAME: N:\graphics\2010\084 USFS Blueledge Mine\N_Maps and Drawings\Final Report\Overall Site Planning LAYOUT NAME: 1 PLOTTED: Friday, January 20, 2012 - 2:10pm



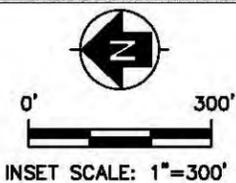
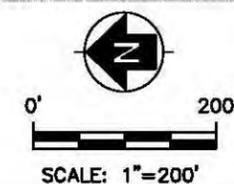
- LEGEND:**
- FOREST SERVICE/HAUL ROAD
 - DECOMMISSIONED HAUL ROAD
 - PROPERTY BOUNDARY
 - RECLAMATION AREA
 - STREAM
 - WASTE ROCK BOUNDARY REMOVAL LIMIT

- APPROXIMATE LOCATION OF ADIT
- APPROXIMATE LOCATION OF MINE SHAFT

NOTES:

WRP-3 AND WRP-4 RECLAMATION AREAS ARE ALSO THE WASTE ROCK BOUNDARY REMOVAL LIMITS.

FR = FOREST SERVICE ROAD
HR = HAUL ROAD

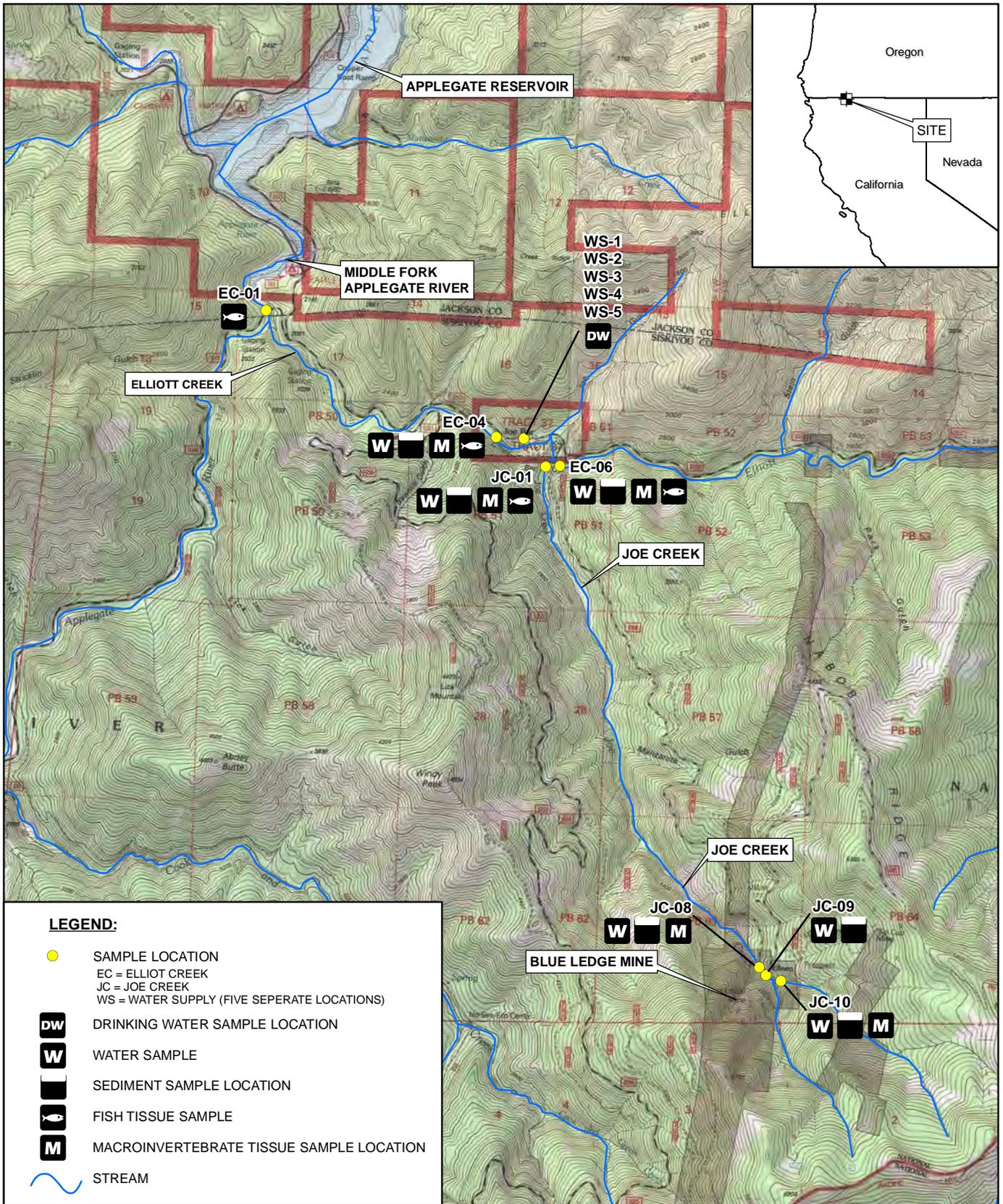


SOURCE: URS BLUE LEDGE MINE REMOVAL ACTION, DRAWING NO. 101, SHEET 7 OF 60, CAD FILE NO. 101, DATED: 2/2010.

ERRG Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, California 94553
(925) 969-0750

CLIENT:	USDA FOREST SERVICE	OVERALL SITE PLAN			
LOCATION:	BLUE LEDGE MINE REMOVAL ACTION				
DRAWN BY:	RDB 11/18/11	CHECKED BY:	JGS 11/21/11	PROJECT NO.	2010-084
				FIG NO.	2

N:\Graphics\2010\2010-084 USFS Blueledge Mine\2011 GIS\Sampling_Locations.mxd



LEGEND:

- SAMPLE LOCATION
- EC = ELLIOT CREEK
- JC = JOE CREEK
- WS = WATER SUPPLY (FIVE SEPERATE LOCATIONS)
- DW** DRINKING WATER SAMPLE LOCATION
- W** WATER SAMPLE
- S** SEDIMENT SAMPLE LOCATION
- F** FISH TISSUE SAMPLE
- M** MACROINVERTEBRATE TISSUE SAMPLE LOCATION
- STREAM

SOURCE: "PROPOSED SAMPLING LOCATIONS", URS CORPORATION, 2010
 DUTCH CREEK, CALIFORNIA USGS 7.5' TOPO QUAD, 1981
 KANGAROO MOUNTAIN, CALIFORNIA USGS 7.5' TOPO QUAD, 1981
 SQUAW LAKES, OREGON USGS 7.5' TPO QUAD, 1983
 CARBERRY CREEK, OREGON USGS 7.5' TOPO QUAD, 1983

0 3,660



SCALE: 1" = 3,600'



Engineering/Remediation
 Resources Group, Inc.
 4585 Pacheco Blvd, Suite 200
 Martinez, California 94553
 (925) 969-0750

CLIENT:
 USDA FOREST SERVICE

LOCATION: BLUE LEDGE MINE
 ROGUE RIVER-SISKIYOU
 NATIONAL FOREST

SAMPLING LOCATIONS

DRAWN BY: JJC 1/17/2012	CHECKED BY: JS 1/17/2012	PROJECT NO. 2010-084	FIG NO. 3
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Tables

Table 1. Summary of Sampling Frequencies

Sample Matrix	Analyses	No. of Sample Locations	No. of Duplicates	No. of MS/MSD Samples
Biannual Samples (Spring and Fall)				
Drinking Water	Dissolved Metals	5	1	1
	Alkalinity			
	Hardness			
	Sulfate			
	Total Dissolved Solids			
	Total Suspended Solids			
Surface Water	Dissolved Metals	6	1	1
	Alkalinity			
	Hardness			
	Sulfate			
	Total Dissolved Solids			
	Total Suspended Solids			
Sediment (Creek)	Metals	6	1	1
	Particle Size			
	% moisture			
Annual Samples (Fall Only)				
Fish Tissue ¹	Metals	4	1	0
Aquatic Macroinvertebrate ¹	Species Composition and Taxa Richness	6	0	0
	Community Structure	6	0	0
	Benthic Index of Biotic Integrity	6	0	0

Notes: All drinking water, surface water, creek sediment, and fish tissue samples will be analyzed for arsenic, cadmium, copper, iron, lead, and zinc.

1 = Macroinvertebrate and fish tissue samples will be collected annually in the fall only.

MS/MSD = Matrix spike/matrix spike duplicate

Table 2. Drinking Water Analytical Data

Sample Location ID No.	Sample ID No.	Sample Date	Field Parameters					General Chemistry Parameters (mg/L)					Dissolved Metals						
			Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)	Total Alkalinity (CaCO ₃)	Hardness (CaCO ₃)	Total Dissolved Solids	Total Suspended Solids	Sulfate	Arsenic (µg/L)	Cadmium (µg/L)	Copper (µg/L)	Iron (µg/L)	Lead (µg/L)	Zinc (µg/L)	
Ziem's Residence	WS-1	2008	NR	NR	NR	NR	NR	NR	244	256	267.00	5 U	18.2	6.24	0.554	9.67	ND<20	2.82	540
Ruetiger's Residence	WS-2	2008	NR	NR	NR	NR	NR	NR	258	271	276.00	5 U	21	0.22 J	0.019 J	1.16	ND< 4	0.09	7
Neilson's Residence	WS-3	2008	NR	NR	NR	NR	NR	NR	160	246	324.00	5 U	77.4	2.04	0.062	4.00	ND<20	0.17	43
461 (Bob's Cabin)	BL-DW-461-063010	30-Jun-10	13.9	0.52	9.57	7.75	18.1	136	138	116	ND<5.00	8.23	ND<0.50	ND<0.02	1.00	ND<20.00	0.03	4.50	
	BL-DW-461-063010DUP	30-Jun-10	--	--	--	--	--	134	139	161	ND<5.00	8.15	ND<0.50	ND<0.02	0.90	ND<20.0	0.02	4.30	
	NS	21-Sep-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	NS	12-Jan-11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	NS	13-Jul-11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	NS	1-Nov-11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
462 (Bridgett)	BL-DW-462-063010	30-Jun-10	19.2	0.752	4.32	7.41	16	176	202	275	ND<5.00	35.50	1.90	0.05	4.60	ND<20.00	0.20	22.30	
	BL-DW-462-092110	21-Sep-10	13.74	0.415	20.54	6.72	1.3	173	246	346	ND<5.00	58.90	ND<2.00	ND<1.00	6.77	NS	ND<1.00	21.90	
	BL-DW-462-011211	12-Jan-11	NS	NS	NS	NS	NS	189	192	240	ND<5.00	22.20	ND<2.00	0.167	33.20	NS	ND<1.00	40.30	
	BL-DW-462-071311	13-Jul-11	17.63	0.405	7.92	7.09	1.6	174	200	283	ND<5.00	42.60	ND<2.00	ND<0.100	18.90	NS	ND<1.00	26.30	
	BL-DW-462-071311 DUP	13-Jul-11	--	--	--	--	--	180	200	286	ND<5.00	42.60	ND<2.00	ND<0.100	12.90	NS	ND<1.00	15.40	
	BL-DW-462-110111	1-Nov-11	7.98	0.371	18.26	7.74	0.9	172	237	338	5.00	73.00	1.79 J	ND<0.2	11.90	748.00	ND<1.00	31.00	
	BL-DW-462-050212	2-May-12	7.61	0.403	8.48	7.33	1.5	158	199	226	ND<5.00	30.30	1.86 J	0.0667	12.10	457.00	ND<1.00	31.30	
	BL-DW-462-101612	16-Oct-12	14.61	0.289	11.58	7.63	1.2	157	223	348	ND<5.00	70.60	4.38	0.0667	29.1	981	ND<1.00	1,210	
541 (Johan)	BL-DW-541-063010	30-Jun-10	15.6	0.9	4.3	7.19	18.7	230	247	302	ND<5.00	31.4	7	0.26	4.9	ND<20.00	1.09	194	
	BL-DW-541-092110	21-Sep-10	13.14	0.388	17.89	7.07	6.0	242	265	302	ND<5.00	21.4	5.1	ND<1.00	4.77	NS	ND<1.00	228	
	BL-DW-541-011211	12-Jan-11	NS	NS	NS	NS	NS	51	62.8	81	ND<5.00	4.81	ND<2.00	0.0667	ND<4.00	NS	ND<1.00	7.96	
	BL-DW-541-011211 DUP	12-Jan-11	--	--	--	--	--	66.2	63.3	81	ND<5.00	4.84	ND<2.00	0.0667	ND<4.00	NS	ND<1.00	6.31	
	BL-DW-541-011211 MSMSD	12-Jan-11	--	--	--	--	--	65.4	64	79	ND<5.00	4.87	ND<2.00	0.0778	ND<4.00	NS	ND<1.00	10.1	
	BL-DW-541-071311	13-Jul-11	13.53	0.400	6.38	7.03	1.4	244	243	283	ND<5.00	22.6	5.84	ND<0.1	8.97	NS	ND<1.00	47.6	
	BL-DW-541-110111	1-Nov-11	9.76	0.356	14.98	7.41	1.9	259	262	301	ND<5.00	17.4	5.49	ND<0.20	12.1	766	ND<1.00	50.4	
	BL-DW-541-110111MSMSD	1-Nov-11	--	--	--	--	--	261	272	295	ND<5.00	17.4	5.89	ND<0.20	11.8	759	ND<1.00	39.2	
	BL-DW-541-050212	2-May-12	7.92	0.415	7.62	7.39	1.5	226	284	277	ND<5.00	23.8	6.33	0.167	4.16	558	ND<1.00	201	
	BL-DW-541-050212 MSMSD	2-May-12	--	--	--	--	--	236	261	263	ND<5.00	23.5	6.5	0.167	3.78	569	ND<1.00	196	
	BL-DW-541-101612	16-Oct-12	13.46	0.277	23.9	7.72	1.8	234	252	272	ND<5.00	17.6	6.43	0.0556	9.7	953	ND<1.00	32.2	
	BL-DW-541-101612 MSMSD	16-Oct-12	--	--	--	--	--	235	253	282	ND<5.00	17.6	5.86	ND<0.0400	8.44	938	ND<1.00	34.5	
	BL-DW-541-050213	2-May-13	11.42	0.337	11.52	7.28	39.2	281	257	268	ND<5.00	21.3	5.96	0.133	6.76	1,760	0.522	210	
12620 (Ron James)	BL-DW-12620-063010	30-Jun-10	12.0	0.941	4.54	7.43	29.6	258	259	345	ND<5.00	21.5	5.4	0.04	1	103	0.12	24.8	
	NS	21-Sep-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	NS	12-Jan-11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	BL-DW-12620-071311	13-Jul-11	16.45	0.446	7.16	7.23	1.6	255	260	308	ND<5.00	24.9	4.12	ND<0.10	21.7	NS	1.46	109	
	BL-DW-12620-071311MSMSD	13-Jul-11	--	--	--	--	--	256	258	311	ND<5.00	24.9	4.37	0.133	22.2	NS	1.13	191	
	NS	1-Nov-11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	NS	2-May-12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	BL-DW-12620-101612	16-Oct-12	12.12	0.202	12.19	7.50	1.8	244	269	300	ND<5.00	21.9	3.84	0.0667	4.83	1110	ND<1.00	30.7	
BL-DW-12620-050213	2-May-13	10.77	0.355	9.11	7.11	54.1	255	279	299	ND<5.00	21.6	4.17	ND<0.200	1.16	2,170	ND<1.00	13.0		
12620 (Irrigation Well)	BL-DW-12620irrig-101612	16-Oct-12	12.12	0.202	24.13	7.77	1.8	197	210	231	ND<5.00	9.95	ND<0.50 ^a	0.0667	ND<2.00	845	ND<1.00	19.5	
	BL-DW-12620irrig-050213	2-May-13	11.14	0.271	9.21	6.86	27.8	149	215	211	ND<5.00	10.2	ND<0.500	ND<0.200	1.37	1,520	ND<1.00	27.0	
17607 (Luke)	BL-DW-17607-063010	30-Jun-10	17.4	0.782	9.35	7.73	11.8	230	135	283	ND<5.00	19.7	ND<0.50	0.03	1.7	ND<20.00	0.11	8.6	
	BL-DW-17607-092110	21-Sep-10	13.57	0.414	16.46	7.75	2.4	274	295	345	ND<5.00	20.9	ND<2.00	ND<1.00	ND<4.00	NS	ND<1.00	24.9	
	BL-DW-17607-092110DUP	21-Sep-10	--	--	--	--	--	271	297	336	ND<5.00	20.9	ND<2.00	ND<1.00	ND<4.00	NS	ND<1.00	10.5	
	BL-DW-17607-011211	12-Jan-11	NS	NS	NS	NS	NS	220	232	266	ND<5.00	31	3	0.5	6.84	NS	2.02	1730	
	BL-DW-17607-071311	13-Jul-11	15.95	0.405	8.62	7.53	1.2	243	238	268	ND<5.00	17.9	ND<2.00	ND<0.1	ND<4.00	NS	ND<1.00	7.54	
	BL-DW-17607-110111	1-Nov-11	11.32	0.388	16.51	7.97	1.9	268	284	293	ND<5.00	21.3	0.522 J	ND<0.200	ND<4.00	728	ND<1.00	8.96	
	BL-DW-17607-110111DUP	1-Nov-11	--	--	--	--	--	272	278	304	ND<5.00	21.2	ND<0.50 ^a	ND<0.200	16.3	704	1.22	14.2	
	BL-DW-17607-050212	2-May-12	8.2	0.398	8.41	7.63	1.7	180	217	221	ND<5.00	17.1	ND<0.50 ^a	ND<0.0400 ^a	ND<0.200	399	ND<1.00	11	
	BL-DW-17607-050212DUP	2-May-12	--	--	--	--	--	191	216	219	ND<5.00	17.1	ND<0.50 ^a	ND<0.0400 ^a	2.78	391	ND<1.00	12.2	
	BL-DW-17607-101612	16-Oct-12	15.28	0.164	10.05	8.02	1.7	254	275	354	ND<5.00	22.6	ND<0.50 ^a	ND<0.0400 ^a	4.50	890	ND<1.00	8.72	
	BL-DW-17607-101612DUP	16-Oct-12	--	--	--	--	--	251	271	306	ND<5.00	22.7	ND<0.50 ^a	ND<0.0400 ^a	5.89	909	ND<1.00	12.8	
	BL-DW-17607-050213	2-May-13	10.04	0.289	11.79	7.59	27.7	215	233	244	ND<5.00	17.0	ND<0.500	ND<0.200	ND<2.00	1,360	ND<1.00	ND<4.00	
	BL-DW-17607-050213DUP	2-May-13	--	--	--	--	--	214	240	231	ND<5.00	17.2	ND<0.500	ND<0.200	ND<2.00	1,380	ND<1.00	ND<4.00	
Human Health Screening Criteria ¹																			
	EPA MCLs		--	--	--	--	--	--	--	--	--	--	--	10	5	1,300	300	15	--
	EPA RSLs for Tap Water		--	--	--	--	--	--	--	--	--	--	--	0.045	6.9	620	11,000	--	4,700
	California MCLs		--	--	--	--	--	--	--	--	--	--	--	10	5	1,000 ^b	300	15	5,000 ^b
	North Coast Basin Plan		--	--	--	--	--	--	--	--	--	--	--	50	10	--	--	50	--

Table 2. Drinking Water Analytical Data (continued)

Notes:

* Arsenic analyzed by ICPMS fall 2012 only

1 = Human health screening criteria are from Table 3-1a in the Engineering Evaluation and Cost Analysis for Blue Ledge Mine (URS Corporation, 2010b).

a= MDL, rather than RL

b = Secondary Maximum Contaminant Level (California Department of Public Health)

Bold = result exceeds screening criteria

Italic = RL or MDL is above selected screening criteria

461 = Bob's residence

462 = Bridgett's residence

541 = Johan's residence

12620 = Ron James residence

17607 = Luke's residence

BL= Blue Ledge

DW = Drinking water

EPA = U.S. Environmental Protection Agency

ICPMS = Inductively coupled plasma mass spectrometry

J = estimated value

MCL = maximum contaminant levels

MDL = method detection limit

mg CaCO₃/L = milligrams of calcium carbonate per liter

mg/L = milligrams per liter

mS/cm = milliSiemens per centimeter

ND < = not detected at concentrations greater than the reporting limit

ND < 0.50 = Non detected above the laboratory method reporting limit

NR = not reported

NS = not sampled

NTU = Nephelometric Turbidity Unit

RL = reporting limit

RSLs = regional screening levels

µg/L = micrograms per liter

- = not applicable

Table 3. Surface (Creek) Water Analytical Data

Sample Location ID No.	Sample ID No.	Sample Date	Field Parameters			General Chemistry Parameters (mg/L)					Dissolved Metals (µg/L)						
			pH (SU)	Conductivity (mS/cm)	Temperature (°C)	Total Alkalinity (CaCO ₃)	Hardness (CaCO ₃)	TDS	TSS	Sulfate	Arsenic	* Dissolved Arsenic by ICPMS with Hydride Preparation	Cadmium	Copper	Iron	Lead	Zinc
EC-04	EC-04-SW-080625-URS	25-Jun-08	7.51	0.101	13.5	42.00	44.00	64.00	ND<5.00	3.00	0.37 B	--	0.04	3.22	ND<4.0	0.012 B	3.82
	EC-04-SW-DUP-080625-URS	25-Jun-08	NA	NA	NA	44.00	43.10	82.00	ND<5.00	2.90	0.4 B	--	0.049	3.25	ND<4.0	0.013 B	4.73
	BL-SW-EC04-110111	1-Nov-11	8.03	0.178	6.5	71.20	68.70	103.00	ND<5.00	6.43	ND<0.50 ^a	--	ND<0.200	ND<4.00	199.00	ND<1.00	5.80
	BL-SW-EC04-050212	2-May-12	7.66	0.088	5.28	32.70	36.70	29.00	15.00	2.67	0.567 J	--	ND<0.0400 ^a	2.17	ND<100	ND<1.00	ND<4.00
	BL-SW-EC04-101612	16-Oct-12	8.34	0.128	11.86	66.2	72.80	101	ND<5.00	6.75	0.556	0.399	ND<0.0400 ^a	5.87	257	ND<1.00	ND<4.00
BL-SW-EC04-050213	1-May-13	8	0.083	6.42	39.3	42.5	33.0	ND<5.00	3.11	0.367	--	ND<0.0400 ^a	2.43	249	ND<0.500 ^a	4.88	
EC-06	EC-06-SW-080625-URS	25-Jun-08	6.92	0.082	10.9	38	40.4	73	ND<5.00	3.1	0.22 B	--	0.18	13.9	ND<4.0	0.016 B	22.3
	BL-SW-EC06-110111	1-Nov-11	7.99	0.180	7.26	61	70.8	88	ND<5.00	5.88	0.589 J	--	ND<0.200	ND<4.00	176	ND<1.00	ND<4.00
	BL-SW-EC06-050212	2-May-12	7.58	0.092	5.46	32.4	37	21	11	2.48	0.664 J	--	ND<0.0400 ^a	ND<2.00	ND<100	ND<1.00	ND<4.00
	BL-SW-EC06-101612	16-Oct-12	7.89	0.143	11.76	67.8	72.8	98	ND<5.00	6.15	0.656	0.45	ND<0.0400 ^a	ND<2.00	250	ND<1.00	ND<4.00
BL-SW-EC06-050213	1-May-13	7.26	0.082	5.72	40.0	42.4	40.0	7.00	2.87	0.378	--	ND<0.0400 ^a	ND<2.00	244	ND<0.500 ^a	ND<4.00	
JC-01	JC-01-SW-080625-URS	25-Jun-08	7.4	0.075	10.5	35	37	48	ND<5.00	5.1	ND<0.07	--	0.564	31.3	ND<4.0	0.014 B	79.4
	BL-SW-JC01-110111	1-Nov-11	7.67	0.161	7.88	66	72.4	102	ND<5.00	12.6	ND<0.50 ^a	--	0.589	15.2	218	ND<1.00	79.1
	BL-SW-JC01-050212	2-May-12	8.01	0.089	6.13	31.8	36.2	52	ND<5.00	4.42	ND<0.50 ^a	--	1.48	16.3	ND<100	ND<1.00	36.1
	BL-SW-JC01-101612	16-Oct-12	7.87	0.122	12.57	55.2	68.5	91	ND<5.00	12.8	ND<0.50 ^a	0.0689	0.344	22.8	263	ND<1.00	30.3
BL-SW-JC01-050213	1-May-13	7.66	0.081	5.37	35.0	42.0	39.0	ND<5.00	5.16	ND<0.500	--	0.322	18.9	295	ND<0.500 ^a	44.8	
JC-08	JC-08-SW-080626-URS	26-Jun-08	6.94	0.047	10.5	21	20.6	21	ND<5.00	2.8	ND<0.07	--	0.228	29	ND<4.0	0.043	42.9
	BL-SW-JC08-110111	1-Nov-11	7.5	0.078	4.59	32.4	35.8	35	ND<5.00	4.64	ND<0.50 ^a	--	ND<0.200	ND<4.00	93.3	ND<1.00	ND<4.00
	BL-SW-JC08-110111DUP	1-Nov-11	--	--	--	45.4	35.5	35	ND<5.00	4.63	ND<0.50 ^a	--	ND<0.200	ND<4.00	93.1	ND<1.00	ND<4.00
	BL-SW-JC08-050212	2-May-12	7.91	0.040	2.91	ND<20.00	19.6	16	ND<5.00	3.19	ND<0.50 ^a	--	0.189	18	ND<100	ND<1.00	31.9
	BL-SW-JC08-050212DUP	2-May-12	--	--	--	ND<20.00	19.7	21	15	3.2	ND<0.50 ^a	--	0.2	17.4	ND<100	ND<1.00	31.3
	BL-SW-JC08-101612	16-Oct-12	7.99	0.052	9.34	28.4	34.6	50	6	6.01	ND<0.50 ^a	0.0521	0.211	10.6	129	ND<1.00	34.8
	BL-SW-JC08-101612DUP	16-Oct-12	--	--	--	28.6	34.7	46	9	6	ND<0.50 ^a	0.0475	0.233	10.2	118	ND<1.00	33.8
BL-SW-JC-08-050113	1-May-13	7.71	0.042	6.17	20.0	20.9	18.0	ND<5.00	3.33	ND<0.500	--	0.189	17.4	201	ND<0.500 ^a	30.2	
BL-SW-JC-08-050113-DUP	1-May-13	--	--	--	ND<20.0	21.0	21.0	ND<5.00	3.4	ND<0.500	--	0.189	18.1	200	ND<0.500 ^a	31.5	
JC-09	JC-09-SW-080627-URS	27-Jun-08	7.29	0.048	9.1	22	21.3	15	ND<5.00	2.3	ND<0.07	--	0.031	3.45	ND<4.0	0.014 B	6.01
	BL-SW-JC09-110111	1-Nov-11	7.53	0.081	5.72	31	33.2	41	ND<5.00	5.97	ND<0.50 ^a	--	0.3	9.57	81.7	ND<1.00	66.4
	BL-SW-JC09-050212	2-May-12	7.73	0.038	2.69	ND<20.00	18.4	16	ND<5.00	2.66	ND<0.50 ^a	--	0.0556	3.66	ND<100	ND<1.00	8.87
	BL-SW-JC09-101612	16-Oct-12	7.76	0.053	9.23	28.8	35.1	44	ND<5.00	5.26	ND<0.50 ^a	0.0484	0.122	6.61	128	ND<1.00	25.5
BL-SW-JC-09-050113	1-May-13	7.38	0.041	6.07	ND<20.0	20.8	ND<10.00	ND<5.00	2.73	ND<0.500	--	0.0444	3.13	198	ND<0.500 ^a	6.80	
JC-10	JC-10-SW-080627-URS	27-Jun-08	8.13	0.055	9.7	25	24.5	26	ND<5.00	2.5	ND<0.07	--	ND<0.008	0.77	ND<4.0	0.007 B	0.65
	BL-SW-JC10-110111	1-Nov-11	7.36	0.083	4.47	32	33.1	51	ND<5.00	4.73	ND<0.50 ^a	--	ND<0.200	ND<4.00	87.5	ND<1.00	16.5
	BL-SW-JC10-110111MSMSD	1-Nov-11	--	--	--	31.8	33	48	ND<5.00	4.72	ND<0.50 ^a	--	ND<0.200	ND<4.00	85.6	ND<1.00	16.8
	BL-SW-JC10-050212	2-May-12	7.85	0.043	2.57	21.5	21.8	ND<10.00	ND<5.00	2.13	ND<0.50 ^a	--	ND<0.0400 ^a	ND<2.00	ND<100	ND<1.00	ND<4.00
	BL-SW-JC10-050212MSMSD	2-May-12	--	--	--	ND<20.00	21.6	37	ND<5.00	2.14	ND<0.50 ^a	--	ND<0.0400 ^a	ND<2.00	ND<100	ND<1.00	ND<4.00
	BL-SW-JC10-101612	16-Oct-12	8.63	0.057	9.09	33.6	38.5	50	ND<5.00	4.85	ND<0.50 ^a	0.0538	ND<0.0400 ^a	ND<2.00	138	ND<1.00	ND<4.00
BL-SW-JC10-101612MSMSD	16-Oct-12	--	--	--	33.2	38.6	51	ND<5.00	4.89	ND<0.50 ^a	0.0488	ND<0.0400 ^a	ND<2.00	139	ND<1.00	ND<4.00	
BL-SW-JC-10-050113	1-May-13	7.24	0.046	5.93	20.8	23.4	20.0	ND<5.00	2.64	ND<0.500 ^a	--	ND<0.0400 ^a	ND<2.00	225	ND<0.500 ^a	ND<4.00	
Ecological Screening Criteria¹																	
California Water Quality Standards (CCC)			--	--	--	--	--	--	--	--	150	150	0.13	--	1,000	0.92	54
EPA NRWQC (CCC)			--	--	--	--	--	--	--	--	150	150	0.25	9	1,000	2.5	120
Human Health Screening Criteria¹																	
California Water Quality Standards (humans ingesting organisms only)			--	--	--	--	--	250.00	--	250.00	--	--	--	--	--	--	--
EPA NRWQC (protective of humans ingesting organisms only)			--	--	--	--	--	--	--	--	0.14	--	--	--	--	--	26,000

Table 3. Surface (Creek) Water Analytical Data *(continued)*

Notes:

* Arsenic analyzed by ICPMS fall 2012 only

1 = Ecological and human health screening criteria are from Table 3-1a in the Engineering Evaluation and Cost Analysis for Blue Ledge Mine (URS Corporation, 2010b).

a= MDL, rather than RL

Bold = concentration exceeds the screening criteria

Italic = Reporting limit is greater than one or more of the selected screening criteria

B = Flagged by the laboratory stating "compound was found in the blank and sample".

CaCO₃ = calcium carbonate

CCC = criterion continuous concentration

DEQ = Oregon Department of Environmental Quality

EPA = U.S. Environmental Protection Agency

ICPMS = Inductively coupled plasma mass spectrometry

J = the result is an estimated quantity; the associated numeric value is the approximate concentration of the analyte in the sample

MDL = method detection limit

mg/L = milligrams per liter

ND< = nondetected above the laboratory method reporting limit

NRWQC = national recommended water quality criteria

U = the analyte was analyzed for but was not detected above the reported sample method detection limit

RL = reporting limit

SU = standard unit

TDS = total dissolved solid

TSS = total suspended solids

µg/L = micrograms per liter

-- = not applicable

Table 4. Creek Sediment Analytical Data

Sample Location ID No.	Sample ID No.	Sample Date	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)	
EC-04	EC-04-SD-080625-URS	25-Jun-08	6.20	0.211	39.90	27,700	5.52	77.10	
	EC-04-SD-DUP-080625-URS	25-Jun-08	5.20	0.270	51.30	32,200	4.72	75.10	
	BL-CS-EC04-110111	1-Nov-11	1.82 J	0.339	33.30	9,420	3.40	57.10	
	BL-CS-EC04-050212	2-May-12	5.97	0.335	73.70	23,200	5.80	72.50	
	BL-CS-EC04-101612	16-Oct-12	3.53	ND<0.669	39.2	15,500	5.03	47.0	
	BL-CS-EC-04-050213	2-May-13	6.70	0.309	113	19,700	5.34	76.9	
EC-06	EC-06-SD-080625-URS	25-Jun-08	4.92	0.581	119	33,200	10.4	114	
	BL-CS-EC06-110111	1-Nov-11	6.11	0.236	37.2	21,500	5.6	53.3	
	BL-CS-EC06-05022012	2-May-12	4.02	0.174	30.9	15,900	3.58	39.1	
	BL-CS-EC06-101612	16-Oct-12	5.41	ND<0.753	38.5	18,900	7.58	42.2	
	BL-CS-EC-06-050213	2-May-13	5.65	0.212	39.2	20,300	4.88	49.5	
JC-01	JC-01-SD-080626-URS	26-Jun-08	3.01	2.14	430	26,200	5.85	440	
	BL-CS-JC01-110111	1-Nov-11	5.91	4.44	975	25,000	12.5	1,010	
	BL-CS-JC01-110111-MSMSD	1-Nov-11	6.34	3.29	903	19,300	35.3	870	
	BL-CS-JC01-05022012	2-May-12	2.48	1.46	423	13,500	6.97	375	
	BL-CS-JC01-050212-MSMSD	2-May-12	5.93	4.17	518	16,300	10.6	797	
	BL-CS-JC01-101612	16-Oct-12	1.12	1.6	271	10,300	2.57	314	
	BL-CS-JC01-101612-MSMSD	16-Oct-12	4.13	2.02	377	14,900	6.01	460	
	BL-CS-JC-01-050213	2-May-13	5.38	2.32	621	23,300	15.7	433	
JC-08	BL-CS-JC-01-050213DUP	2-May-13	4.37	2.40	585	17,000	16.3	602	
	JC-08-SD-080627	27-Jun-08	2.54	0.941	978	24,700	13.8	208	
	BL-CS-JC08-110111	1-Nov-11	1.07 J	0.178	62.2	13,400	1.33	25.3	
	BL-CS-JC08-050212	2-May-12	17.6	7.95	2,250	30,900	45.9	1,210	
	BL-CS-JC08-101612	16-Oct-12	37.2	6.61	1,750	38,100	84.4	1,160	
JC-09	BL-CS-JC08-050113	1-May-13	25.2	2.85	769	29,000	75.9	420	
	Not sampled in 2008								
	BL-CS-JC09-110111	1-Nov-11	30.00	1.79	736.00	41,100	147	403	
	BL-CS-JC09-110111 DUP	1-Nov-11	25.80	4.16	1,010	31,300	90.60	688	
	BL-CS-JC09-050212	2-May-12	5.32	0.496	154	16,000	9.64	84.50	
	BL-CS-JC09-050212DUP	2-May-12	5.07	0.668	174	15,200	12.60	96.20	
	BL-CS-JC09-101612	16-Oct-12	22.7	4.14	1,480	38,700	403	707	
	BL-CS-JC09-101612DUP	16-Oct-12	14.4	2.77	1,170	29,200	43.4	463	
BL-CS-JC-09-050113	1-May-13	13.2	1.54	555	21,500	34.2	254		
JC-10	BL-CS-JC-09-050113DUP	1-May-13	9.69	0.686	222	15,300	29.7	145	
	JC-10-SD-080627-URS	27-Jun-08	2.68	0.214	51.7	24,000	2.67	55.6	
	BL-CS-JC10-110111	1-Nov-11	85.1	19.8	5030	76,500	797	2,900	
	BL-CS-JC10-050212	2-May-12	2	0.258	36.7	12,500	1.84	27.4	
	BL-CS-JC10-101612	16-Oct-12	2.23	ND<0.655	45.1	14,500	1.9	29.3	
BL-CS-JC-10-050113	1-May-13	2.56	0.235	50.5	15,600	2.66	36.3		
Ecological Screening Criteria ¹			7	0.99	42.9	--	17	121	
Human Health Screening Criteria ¹			1.5	39	2,900	--	400	23,000	

Notes:

1 = Ecological and human health screening criteria are from Table 5 in the Final Site Inspection Report for Blue Ledge Mine (URS Corporation, 2009).

Bold = Value is equal to or greater than the screening criteria

J = estimated value

mg/kg = micrograms per kilogram

ND< = nondetect at concentration greater than the laboratory method reporting limit

-- = not applicable

Table 5. Fish Species Sample Data

Sampling Location ID No.	Species	Quantity Collected	Age	Length (inches)	Sample Date
EC-01	Rainbow Trout	1	not reported	7.5	10-Nov-11
	Torrent Sculpin	2	not reported	3.25, 3.75	
	Pacific Giant Salamander	2	1	4.25, 5	16-Oct-12
	Torrent Sculpin	8	1+	2.75, 1.75, 1.75, 2.25, 2, 1.5, 1.25, 1.5	
EC-04	Rainbow Trout	4	unreported, juvenile, juvenile, adult	8.5, 5.5, 3, unreported	10-Nov-11
	Torrent Sculpin	14	not reported	3.5, 3, 3.25, 3, 2.75, 3.5, 3, 3, 2.75, 3, 3.5, 2.25, 3.5, 3.25	
	Rainbow Trout	4	1+, 2+	4.25, 5, 2.75, 2.5	16-Oct-12
	Torrent Sulpin	3	1+	2.75, 2.5, 2.5	
EC-06	Rainbow Trout	5	1 adult, 4 juveniles	9.25, 3.25, 3.5, 3.5, 3.25	10-Nov-11
	Rainbow Trout	1	2+	9.5	16-Oct-12
	Torrent Sculpin	1	1	3.25	
JC-01	Rainbow Trout	1	not reported	6.75	10-Nov-11
	Rainbow Trout	1	2+	6	16-Oct-12

Notes:

rainbow trout = *Oncorhynchus mykiss*

torrent sculpin = *Cottus rhotheus*

Pacific Giant Salamander = Dicamptodontidae

Table 6. Fish Tissue Analytical Data

Sampling Location ID No.	Sample ID No.	Sample Date	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)	Percent Moisture
EC-01	EC-01-TS-111011	10-Nov-11	<i>ND<0.51</i>	<i>ND<0.17</i>	6 J	269 J	<i>ND<0.21</i>	57.1	70.8
	EC-01-TS-101612	16-Oct-12	<i>ND<0.89</i>	0.32 J	5.1	190	0.32 J	100 B	77 H
EC-04	EC-04-FT-080626-URS	26-Jun-08	0.15	0.134	4.79	1,140	0.194	29.2	--
	EC-04-TS-111011	10-Nov-11	<i>ND<0.58</i>	<i>ND<0.19</i>	4.4 J	75.4 J	<i>ND<0.23</i>	113	74.1
<i>Duplicate</i>	EC-04-TSD-111011	10-Nov-11	<i>ND<0.69</i>	0.17 B	7.3 J	95.6 J	<i>ND<0.35</i>	61.7	71.0
<i>Duplicate</i>	EC-04-TS-101612	16-Oct-12	<i>ND<0.69</i>	0.19 J	4.5	120	<i>ND<0.34</i>	150 B	72 H
	EC-04-TSD-101612	16-Oct-12	<i>ND<0.85</i>	0.21 J	8.6	190	<i>ND<0.42</i>	100 B	75 H
EC-06	Not sampled in 2008								
	EC-06-TS-111011	10-Nov-11	<i>ND<0.55</i>	<i>ND<0.18</i>	6.7 J	1,940 J	0.26	76.3	72.9
	EC-06-TS-101612	16-Oct-12	<i>ND<0.79</i>	<i>ND<0.39</i>	8.2	3,100	0.33 J	140 B	76 H
JC-01	Not sampled in 2008								
	JC-01-TS-111011	10-Nov-11	<i>ND<0.48</i>	<i>ND<0.16</i>	5.5 J	97.1 J	<i>ND<0.19</i>	124	68.8
	JC-01-TS-101612	16-Oct-12	<i>ND<0.74</i>	0.39	12	120	<i>ND<0.37</i>	94 B	74 H
Ecological Screening Criteria ¹			6.60	0.15	--	--	0.12	--	NA
Human Health Screening Criteria ¹			0.0062	0.49	--	--	0.50	--	NA

Notes:

1 = Ecological and human health screening criteria are from Table 6 in the Final Site Inspection Report for Blue Ledge Mine (URS Corporation, 2009).

Bold = result exceeds screening criteria

Italic = reporting limit is greater than screening criterion

B = Flagged by the laboratory stating "compound was found in the blank and sample".

H = Flagged by the laboratory stating "sample was prepped or analyzed beyond the specified holding time".

J = Flagged by the laboratory stating "result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value".

mg/kg = milligrams per kilogram

ND< = nondetect at concentration greater than the laboratory reporting limit

NR = not reported

-- = not applicable

Table 7. Aquatic Macroinvertebrate Analytical Data

Sample Date	Sample Location	EPT Richness		Coleoptera Richness		Diptera Richness		% Intolerant Individuals		% Non-Gastropoda Scraper Individuals		% Predator Individuals		% Shredder Taxa		% Non-Insect Taxa		NorCal B-IBI	Condition Category
		Value	Score	Value	Score	Value	Score	Value	Score	Value	Score	Value	Score	Value	Score	Value	Score		
9-Nov-11	JC-01	3	1	0	0	3	3	29.03	7	0.00	0	32.26	10	16.67	10	0.00	10	51.25	Fair
16-Oct-12		13	5	2	3	4	4	32.89	8	5.26	3	13.16	6	17.39	10	7.89	10	61.25	Good
9-Nov-11	JC-08	5	1	1	1	2	2	76.47	10	5.88	3	52.94	10	25.00	10	0.00	10	58.75	Fair
16-Oct-12		10	3	0	0	1	1	61.70	10	0.00	0	25.53	10	16.67	10	2.13	10	55.00	Fair
9-Nov-11	JC-10	11	4	0	0	1	1	61.90	10	19.05	10	14.29	6	21.43	10	14.29	8	61.25	Good
16-Oct-12		25	10	0	0	6	6	74.31	10	24.11	10	15.18	7	21.21	10	3.57	10	78.75	Good
9-Nov-11	EC-04	12	4	0	0	3	3	39.18	9	18.56	10	16.49	7	0.00	0	0.00	10	53.75	Fair
16-Oct-12		20	7	2	3	5	5	49.59	10	19.01	10	33.06	10	6.25	4	7.44	10	73.75	Good
9-Nov-11	EC-06	14	5	1	1	4	4	22.34	6	9.04	5	7.45	3	0.00	0	6.91	10	42.50	Fair
16-Oct-12		19	7	2	3	6	6	27.32	7	16.62	8	10.42	5	6.67	4	23.38	7	58.75	Fair

Notes:

B - IBI = Benthic Index of Biotoc Integrity

B-IBI Key	
Score	Rating
0 - 19	Very Poor
20 - 39	Poor
40 - 59	Fair
60 - 79	Good
80 - 100	Very Good

Table 8. Leachate Analytical Data

Sample ID No.	Sample Date	Metals																	pH
		Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Mercury (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)	
BL-RS-091211 ¹	12-Sep-11	--	ND<2.00	--	--	127	--	--	17.0	ND<1.00	--	--	--	--	--	--	--	64,700	--
BL-RS-050212 ¹	2-May-12	--	ND<2.00	27.6	--	42.8	ND<2.00	--	--	ND<1.00	0.123	--	--	ND<4.00	ND<1.00	--	--	--	5.57
BL-RS-091412 ²	14-Sep-12	ND<5.00	ND<10.0	23.7	ND<5.00	35.0	ND<10.0	2,090	64.6	ND<5.00	ND<0.400	ND<10.0	1,770	ND<10.0	ND<5.00	ND<5.00	ND<10.0	148,000	4.02
BL-RS-050113 ²	1-May-13	ND<10.0	ND<20.0	15.2	ND<10.0	35.1	ND<20.0	2,600	142	ND<10.0	ND<0.800	ND<20.0	2,150	ND<20.0	ND<10.0	ND<10.0	ND<20.0	153,000	3.26

Notes:
 1 = Analyzed by EPA Method 6020 for dissolved metals.
 2 = Analyzed by EPA Method 6020 for total metals

EPA = U.S. Environmental Protection Agency
 ND< = nondetect at concentration greater than the laboratory method reporting limit
 µg/L = micrograms per liter
 -- = not reported

Table 9. Sediment Basin Analytical Data

Sample ID No.	Sample Date	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)	pH
BL-TB-1A-050212	5/2/2012	41.1	1.77	803	51,100	142	366	--
BL-TB-1B-050212	5/2/2012	45.3	3.04	1,170	58,800	149	543	--
BL-TB-1C-050212	5/2/2012	39.3	1.54	880	49,900	126	320	--
BL-TB-1D-050212	5/2/2012	61.9	1.02	704	58,800	98.2	242	--
BL-TB-1E-050212	5/2/2012	31.0	1.44	521	39,400	57.7	279	--
BL-TB-1F-050212	5/2/2012	50.0	0.467	413	61,000	104	172	--
BL-TB-1FL-050212	5/2/2012	17.4	0.582	247	38,300	55.6	164	--
BL-TB-1F,E,D,C,B,A-050113 ¹	5/1/2013	56.2	1.57	957	73,600	188	313	4.18
BL-TB-2A-050212	5/2/2012	15.5	0.849	512	29,700	76.9	302	--
BL-TB-2B-050212	5/2/2012	11.1	0.667	379	29,800	38.1	429	--
BL-TB-2A,B-050113 ²	5/1/2013	21.9	1.53	731	35,300	83.1	383	5.99
BL-TB-3-050212	5/2/2012	11.4	2.35	2,450	26,800	52.6	365	--
BL-TB-3S-050212	5/2/2012	11.5	1.08	486	26,600	30.8	264	--
BL-TB-3-050113	5/1/2013	15.0	2.83	1,640	24,000	86.9	446	6.52
Soil Removal Goals³		87.00	23.00	1,041.00	NA	179.00	660.00	--
Tolerance Limit (Soil Removal Goals +15%³)		100.05	26.45	1,197.15	NA	205.85	759.00	--

Notes:

Removal goal and tolerance: Metals concentrations are to be no more than 15 percent above the numeric standards, and no more than 15 percent of the sample results will be allowed to have concentrations above the 15 percent tolerance.

Analyzed by U.S. Environmental Protection Agency Method 6020 for metals.

1 = Composite sample from TB 1A, 1B, 1C, 1D, 1E, and 1F.

2 = Composite sample from TB 2A and 2B.

3 = Soil removal goals as presented in Removal Action Completion Report prepared by Engineering/Remediation Resources Group, Inc. in February 2012.

Bold = Value is equal to or greater than the removal goal

Shaded = result exceeds the tolerance limit (removal goal plus 15 percent).

mg/kg = milligrams per kilogram

NA = not applicable

ND< = nondetect at concentration greater than the laboratory reporting limit

-- = not reported

Table 10. Relative Percent Difference Results

Sample ID No.	Matrix	Total Solids	Date	Alkalinity (mg CaCO ₃ /L)	Hardness (mg CaCO ₃ /L)	TDS (mg/L)	TSS (mg/L)	Sulfate (mg/L)	Arsenic (µg/L)	Cadmium (µg/L)	Copper (µg/L)	Iron (µg/L)	Lead (µg/L)	Zinc (µg/L)
BL-DW-17607-050213	Drinking Water	NA	2-May-13	215	233	244	ND<5.00	17.00	ND<0.5	ND<0.200	ND<2.0	1360	ND<1.00	ND<4.0
BL-DW-17607-050213DUP	Drinking Water	NA	2-May-13	214	240	231	ND<5.00	17.20	ND<0.5	ND<0.200	ND<2.0	1380	ND<1.00	ND<4.0
			RPD (%)	0.47	2.96	5.47	0	1.17	0	0	0.00	1.46	0	0.00
BL-SW-JC08-050113	Surface Water	NA	1-May-13	20.0	20.9	18.0	ND<5.00	3.33	ND<0.5	0.189	17.4	201	ND<1.00	30.2
BL-SW-JC08-050113DUP	Surface Water	NA	1-May-13	ND<20	21.0	21.0	ND<5.00	3.40	ND<0.5	0.189	18.10	200	ND<1.00	31.5
			RPD (%)	66.67	0.48	15.38	0.00	2.08	0	0.00	3.94	0.50	0	4.21
BL-CS-JC09-050113	Sediment	74.6	1-May-13	NA	NA	NA	NA	NA	13.20	1.54	555.00	21,500	34.2	254
BL-CS-JC09-050113DUP	Sediment	71.8	1-May-13	NA	NA	NA	NA	NA	9.69	0.686	222	15,300	29.7	145
			RPD (%)	NA	NA	NA	NA	NA	30.67	76.73	85.71	33.70	14.08	54.64

Notes: If analyte is not detected above the reporting limit, half the reporting limit is used to calculate the RPD

Bold = RPD exceeds target range (<40%)

BL= Blue Ledge

DW = Drinking water

mg CaCO₃/L = milligrams of calcium carbonate per liter

mg/L = milligrams per liter

ND < = not detected at concentrations greater than the reporting limit

ND < 0.50 = Non detected above the laboratory method reporting limit

NA = not analyzed

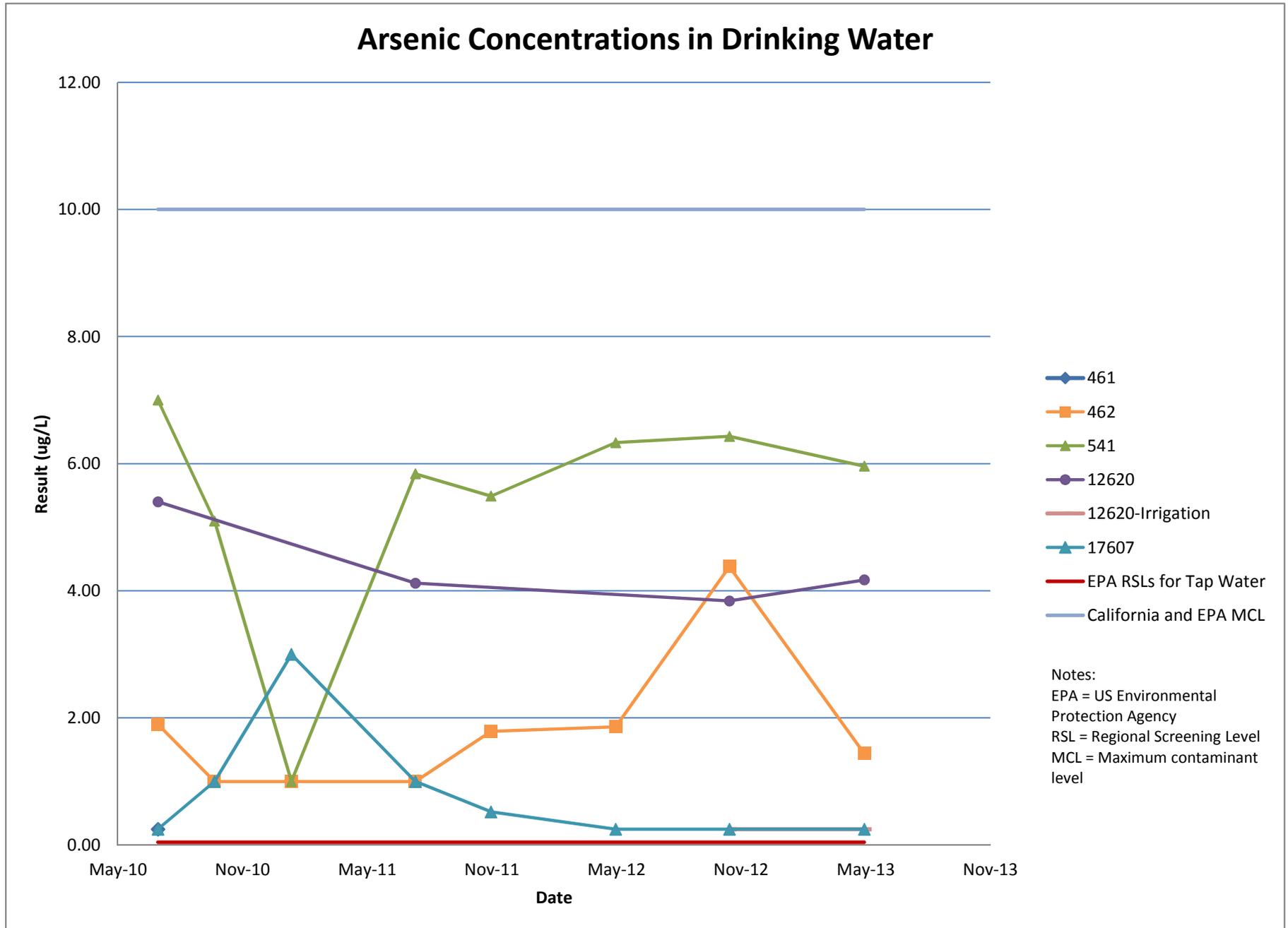
RPD = relative percent difference

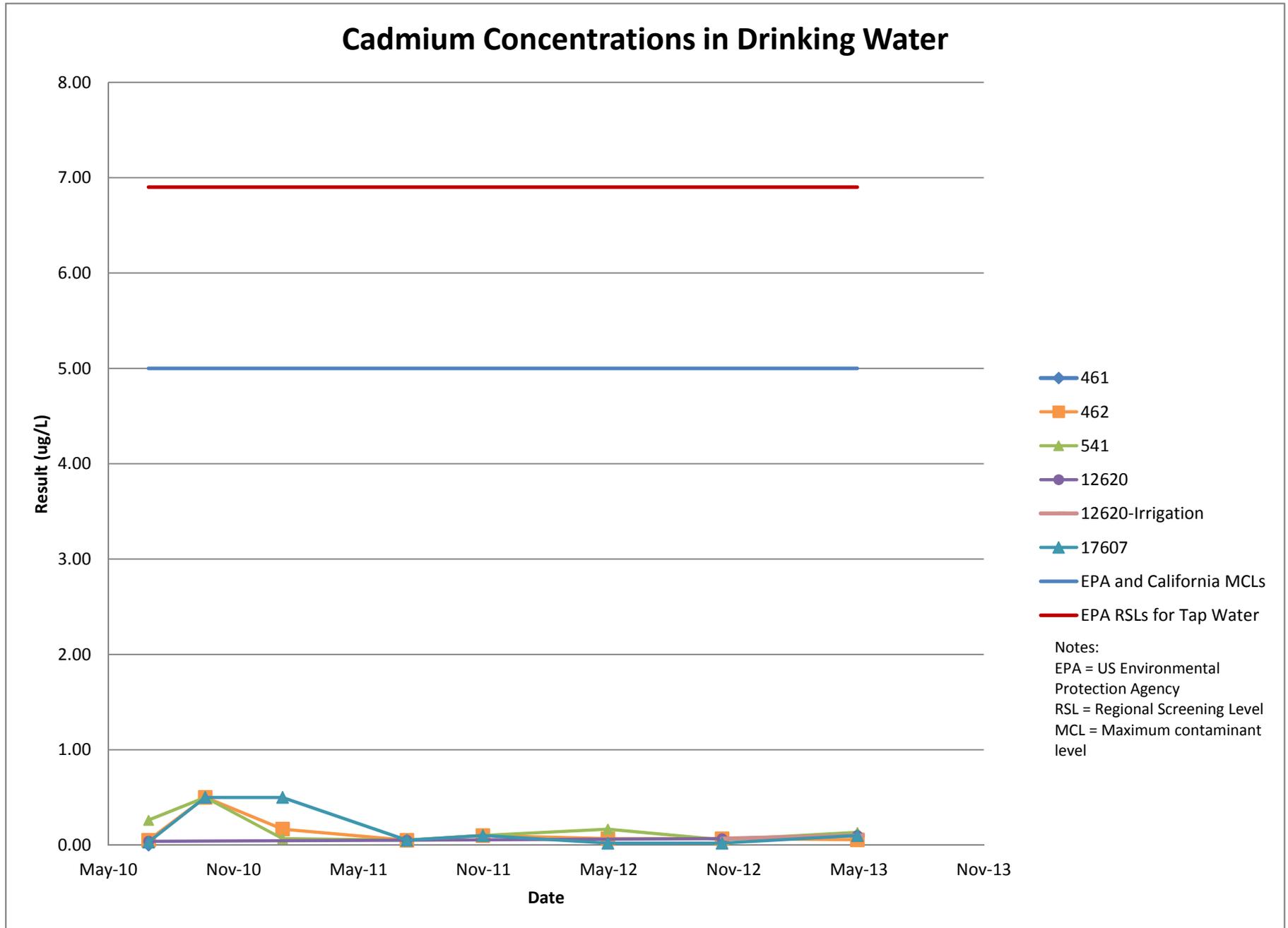
TDS = total dissolved solids

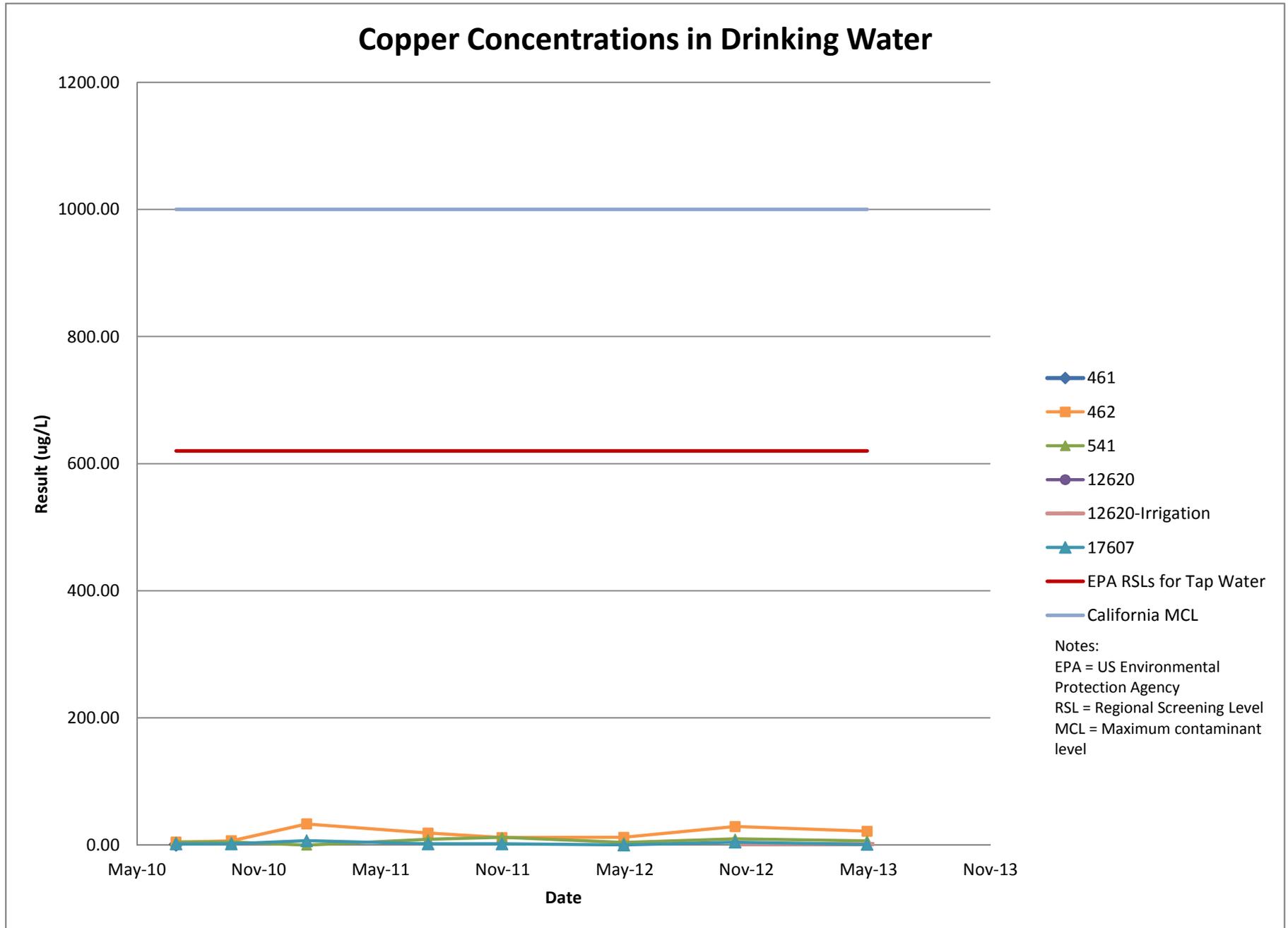
TSS = total suspended solids

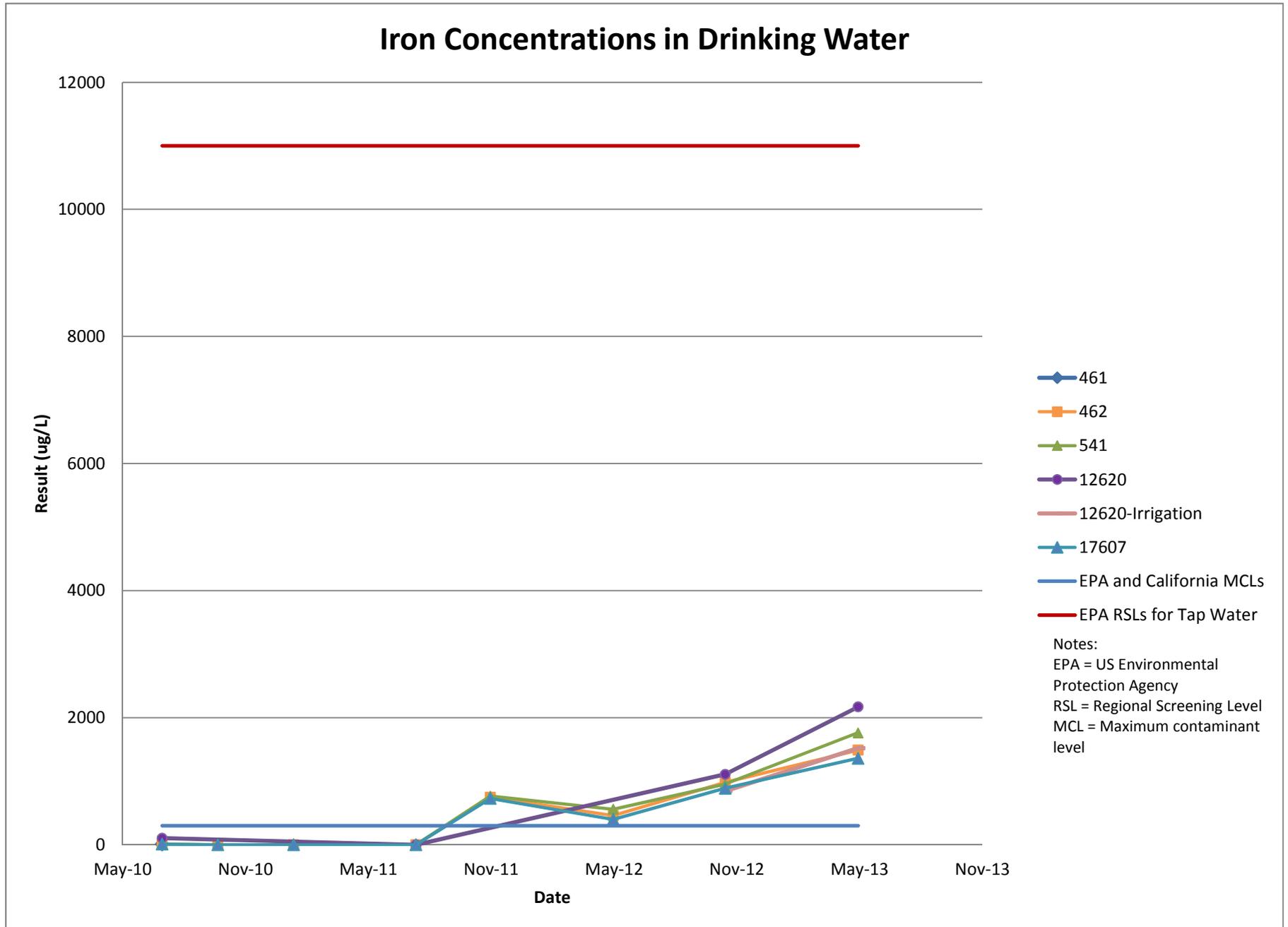
µg/L = micrograms per liter

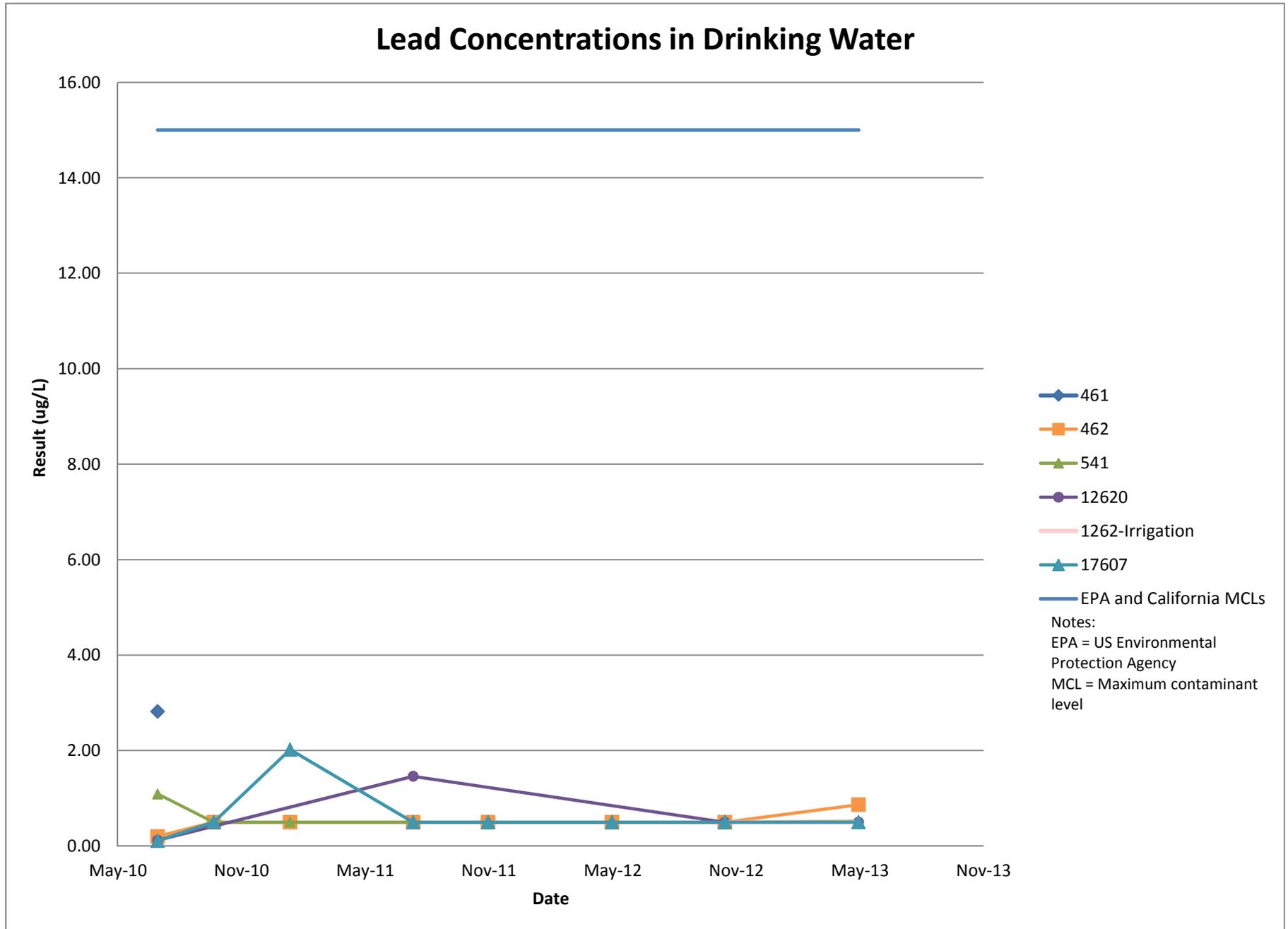
Appendix A. Concentration Trend Graphs

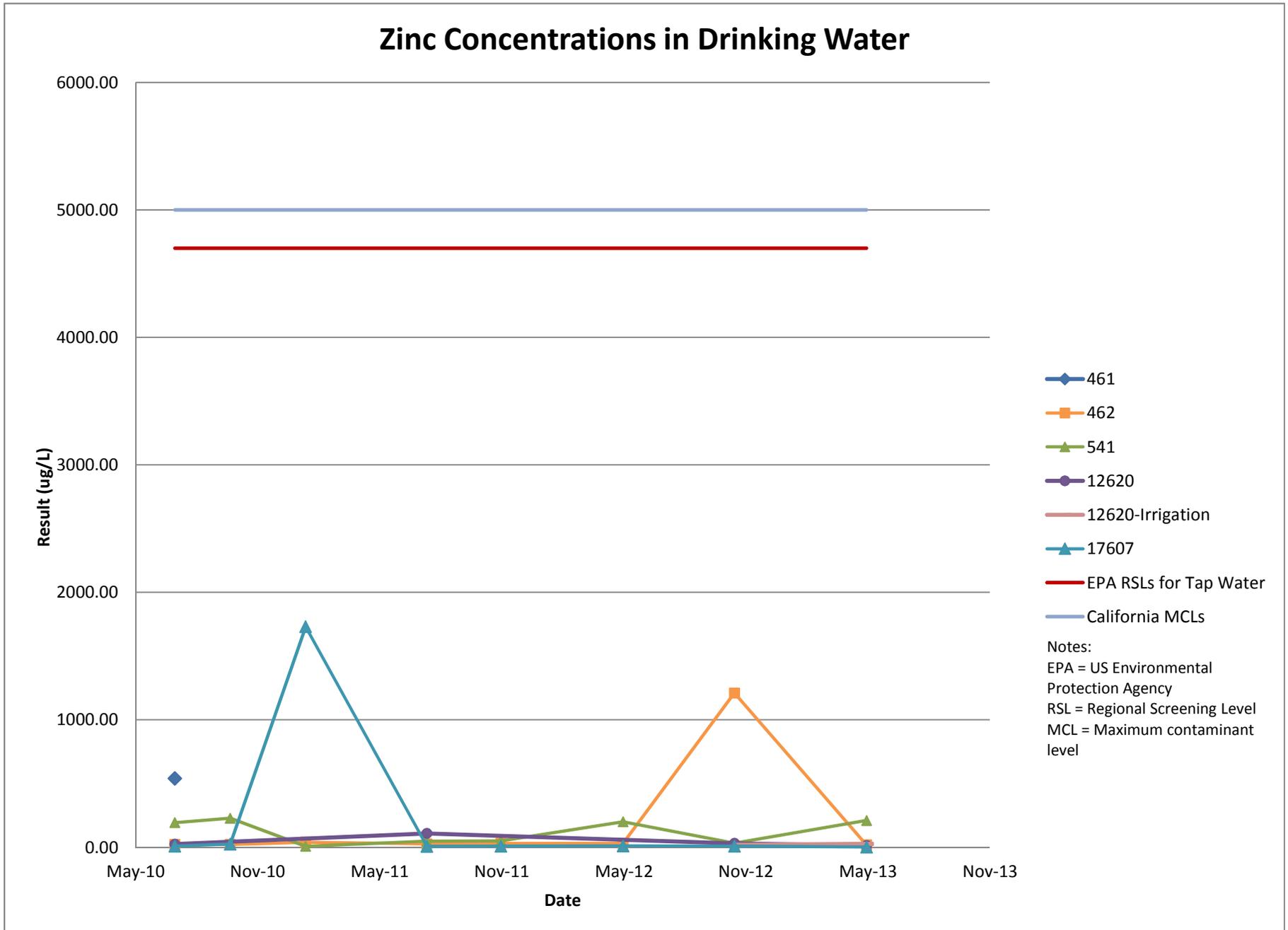


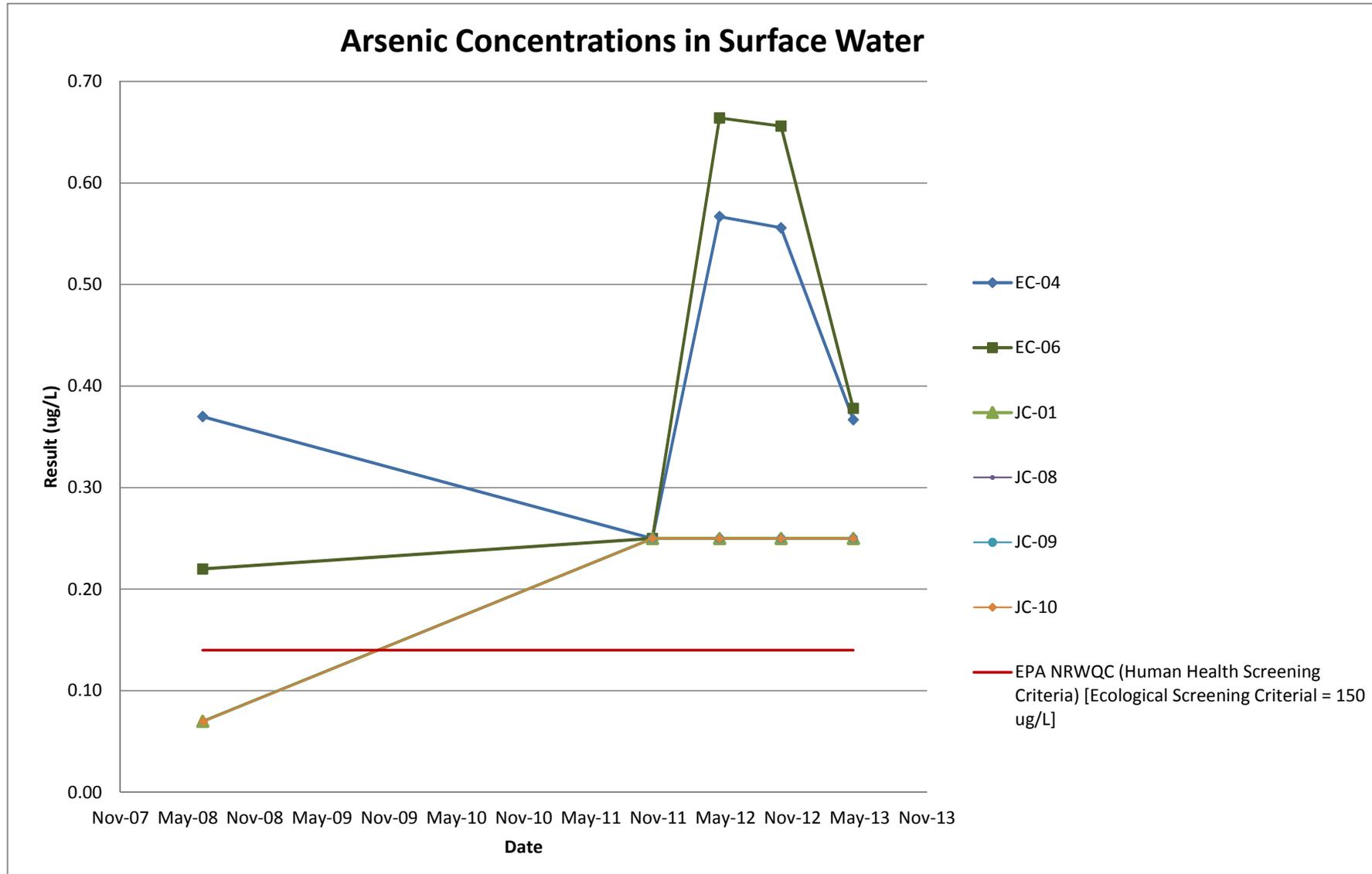


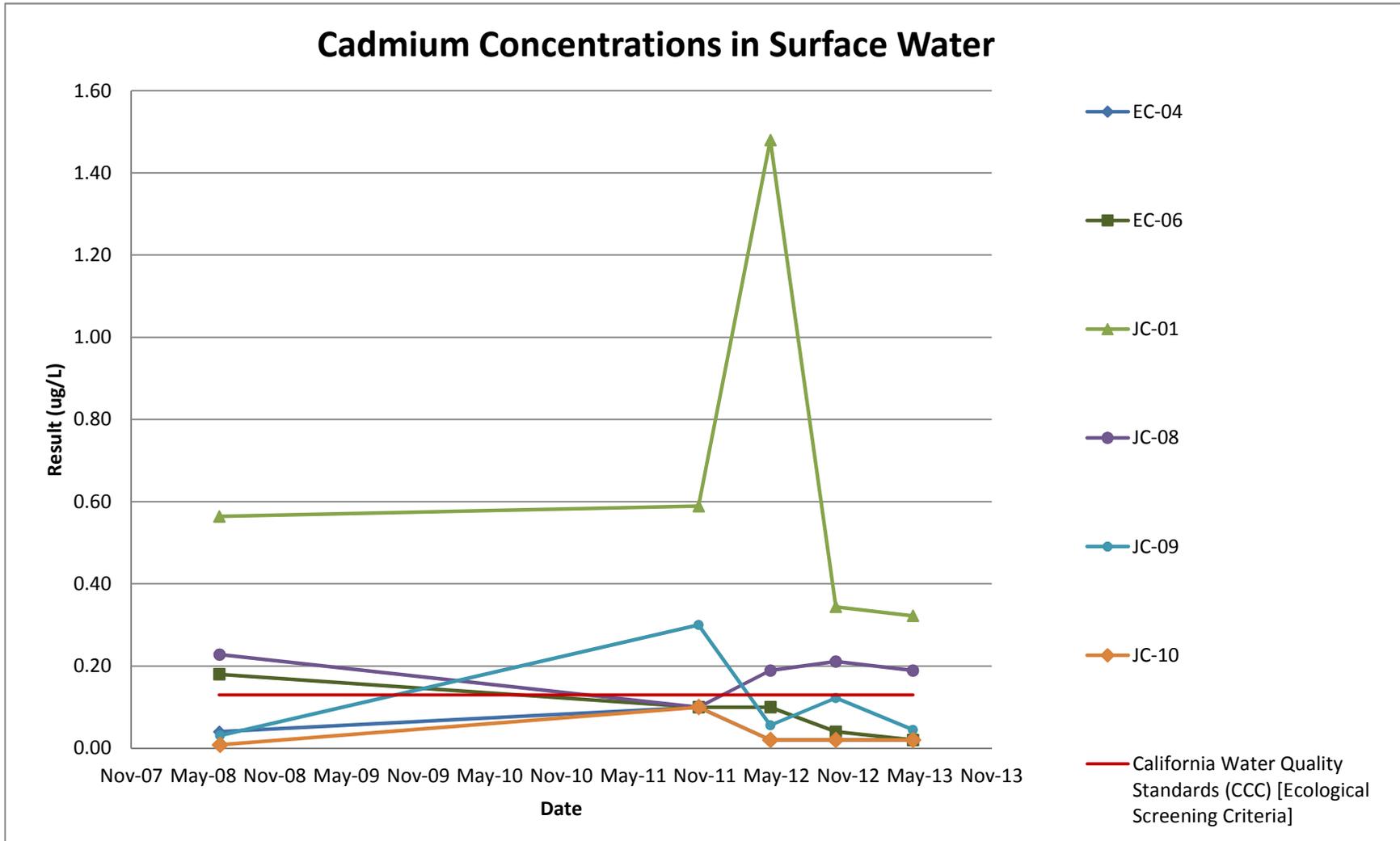


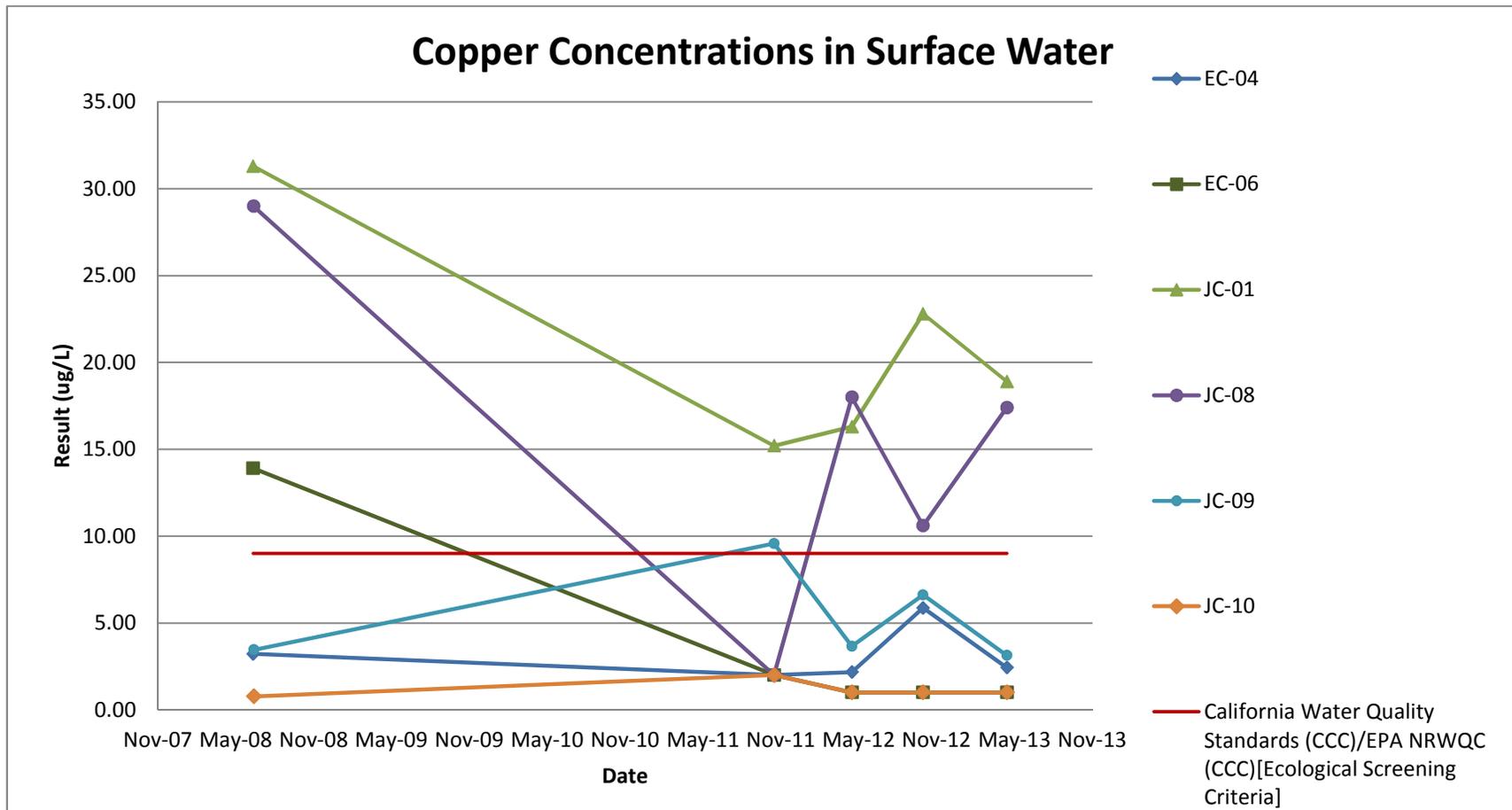


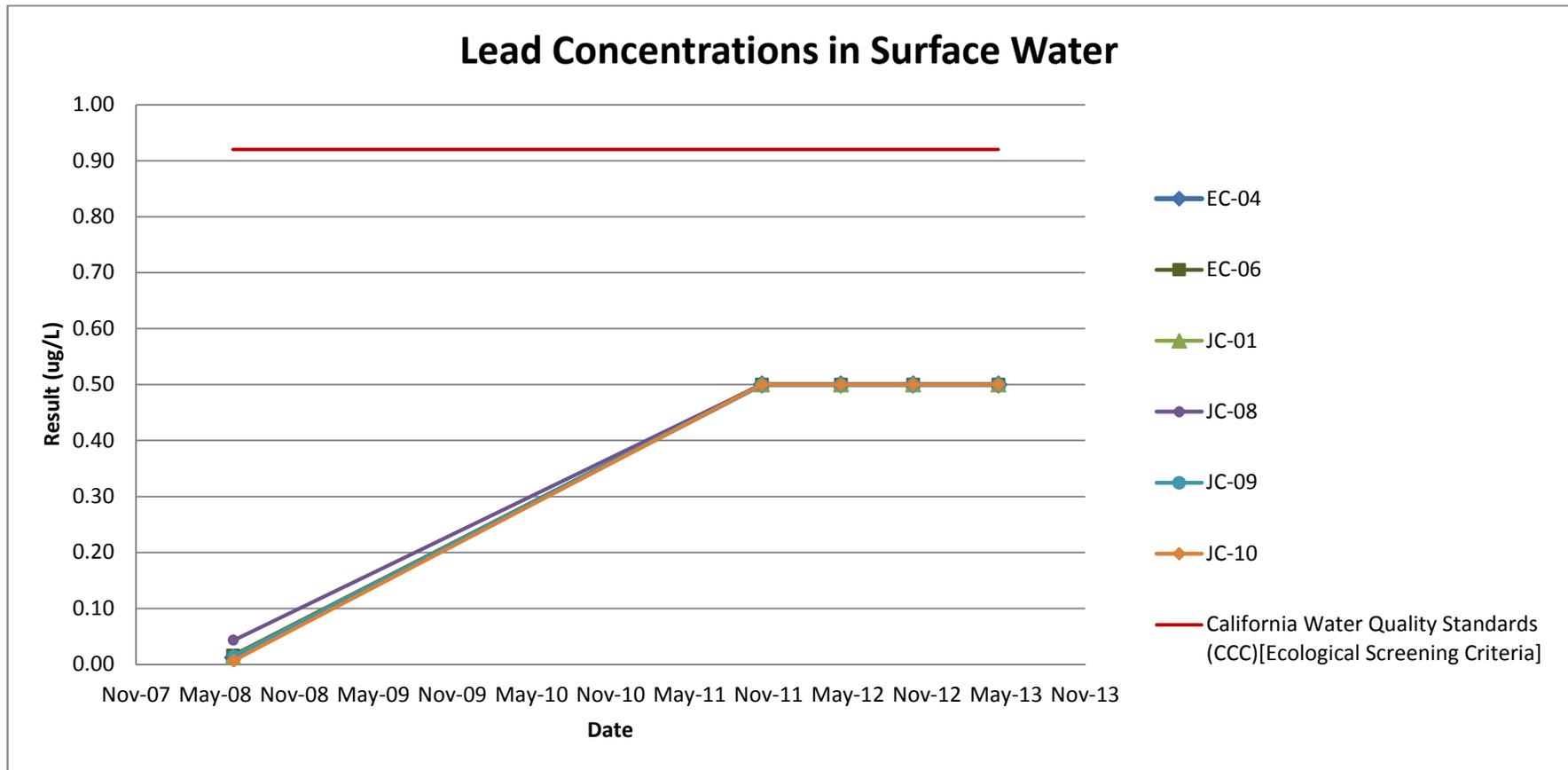


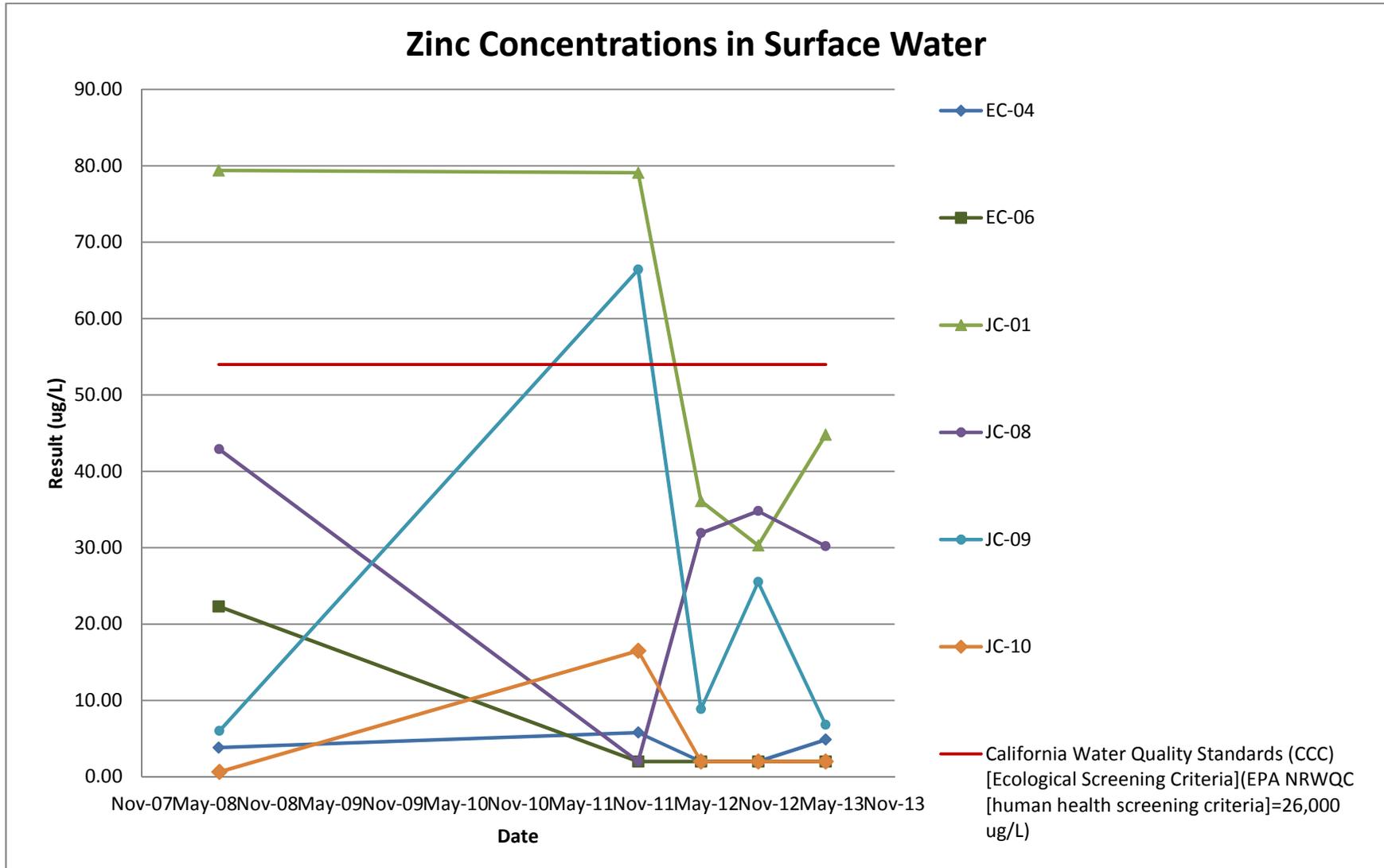


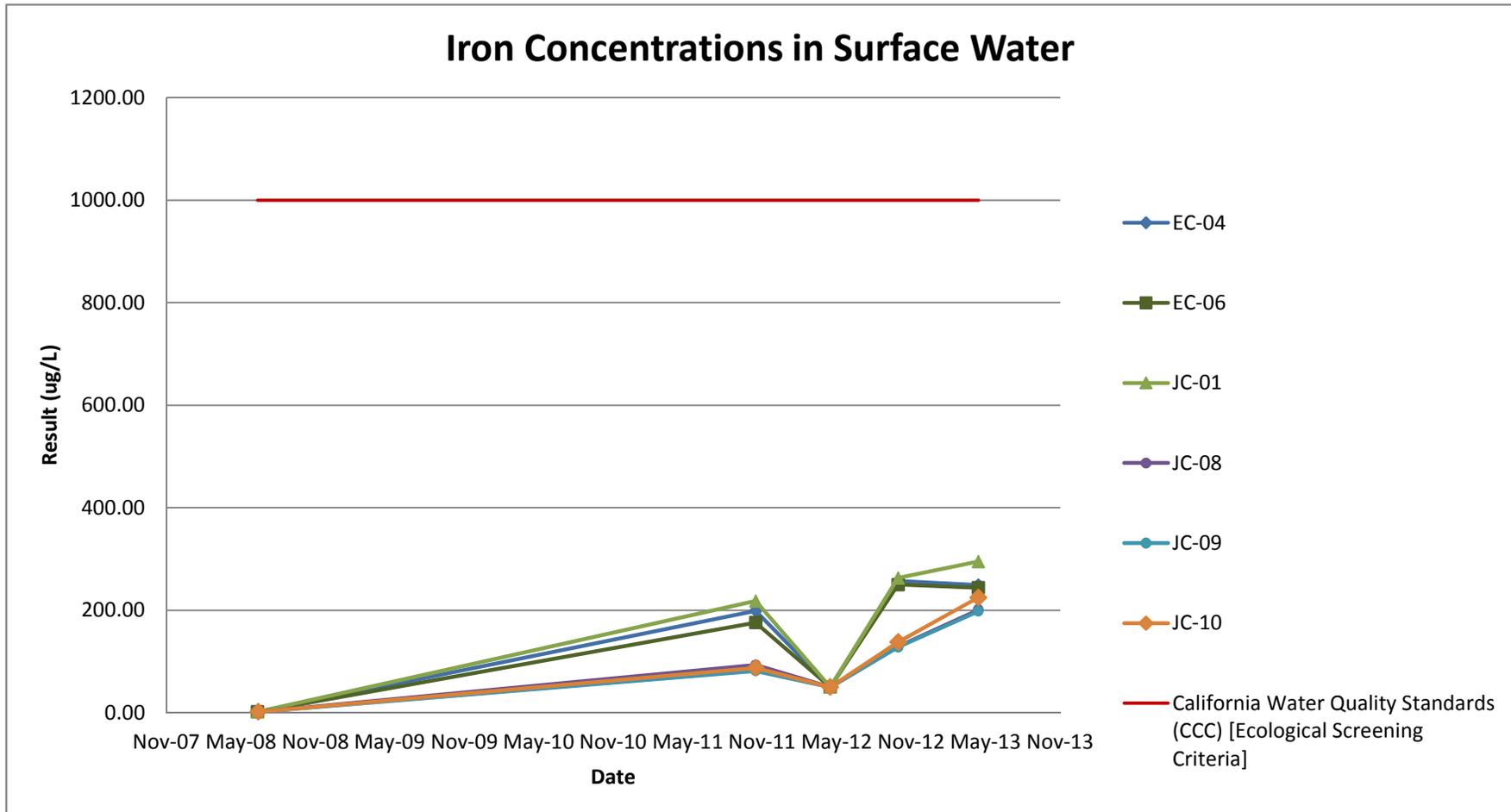


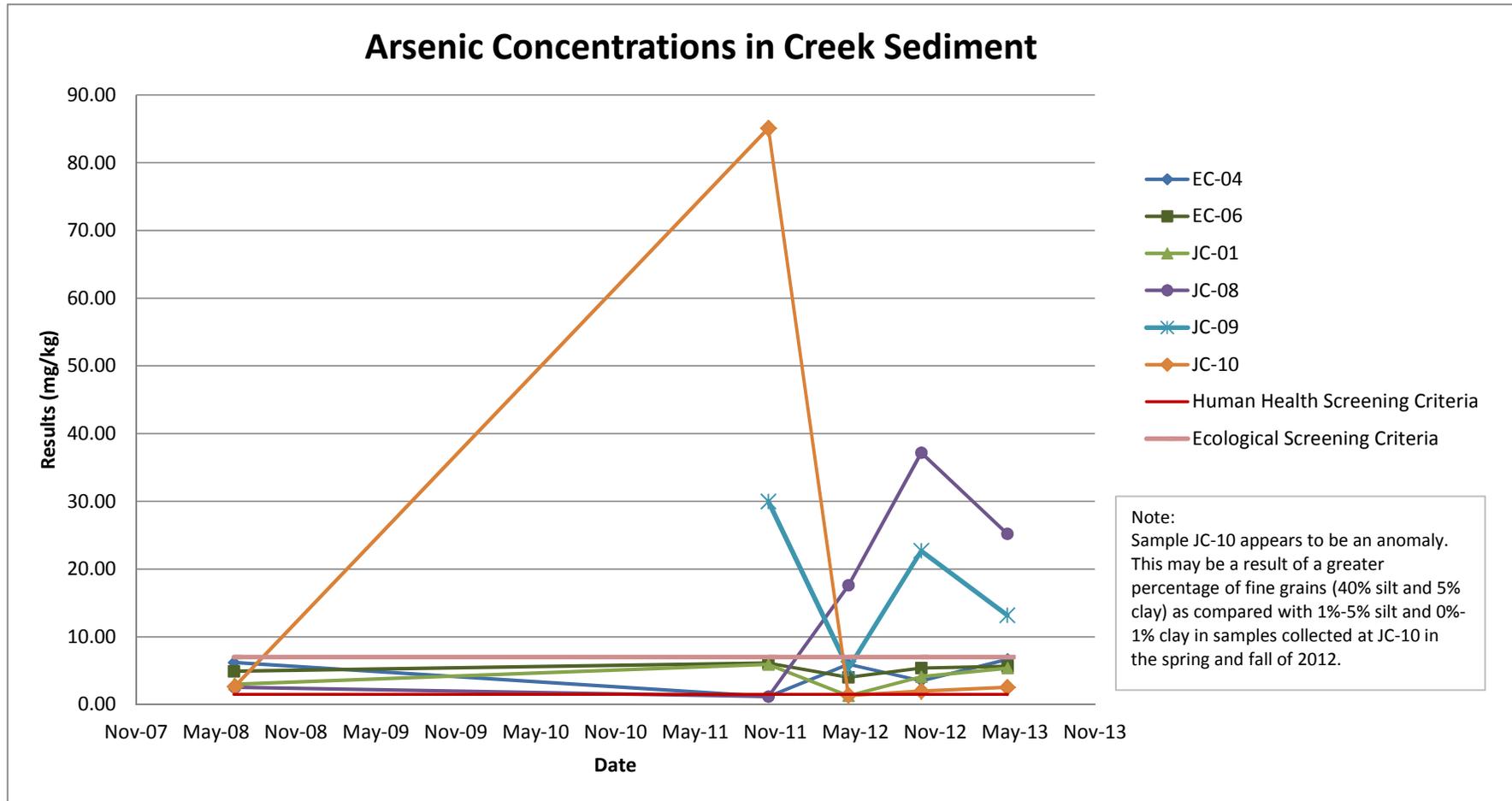


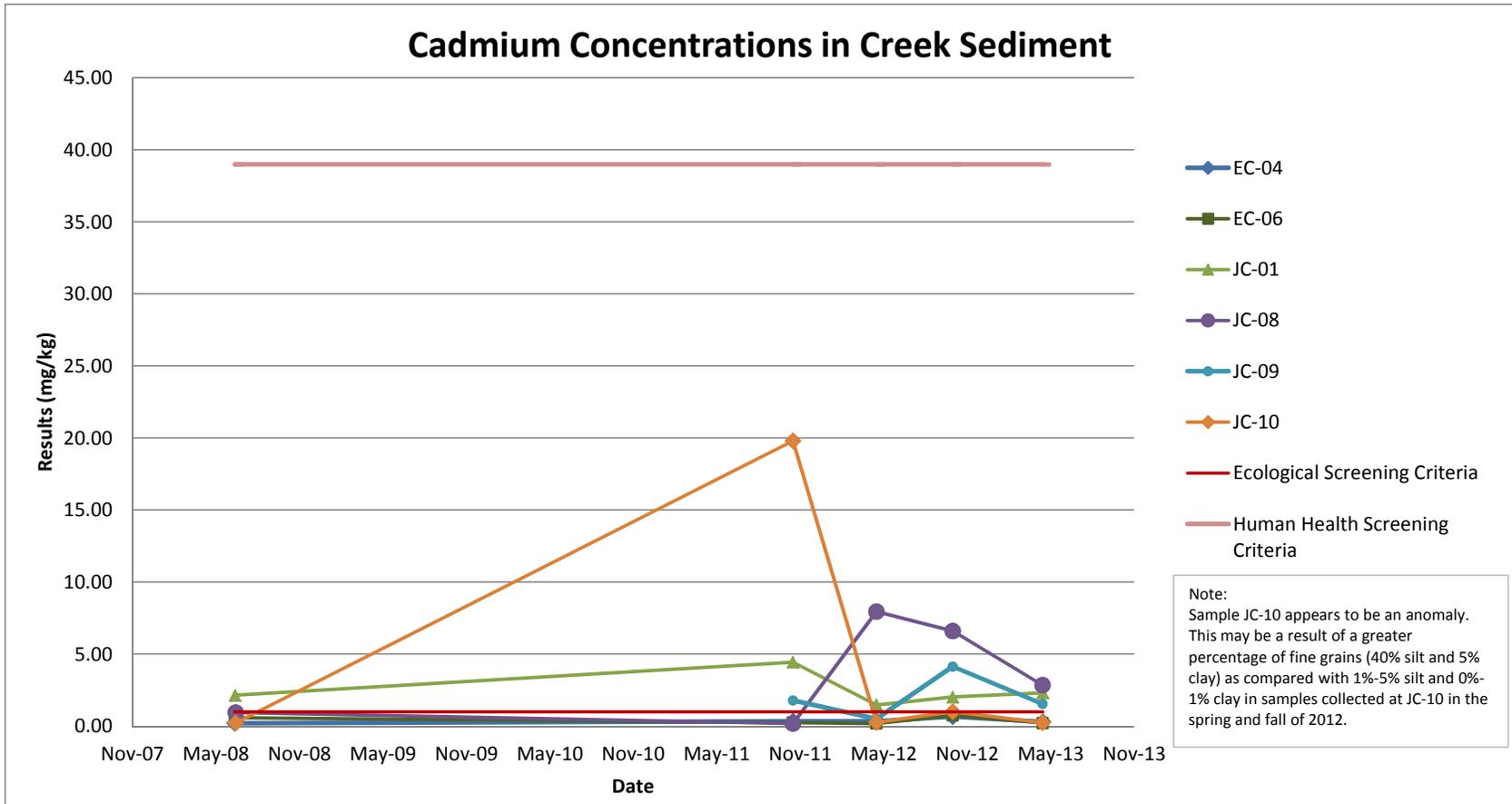


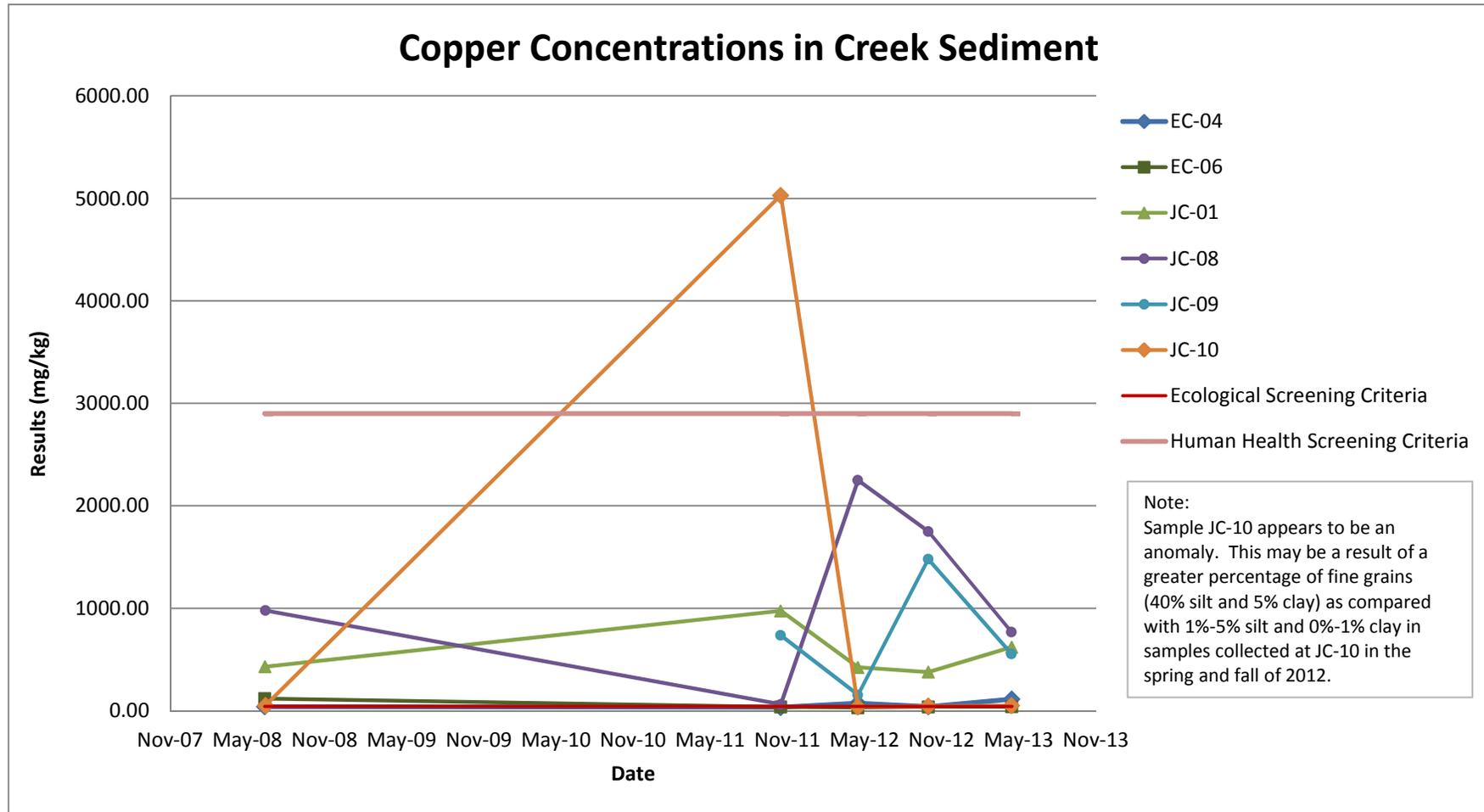


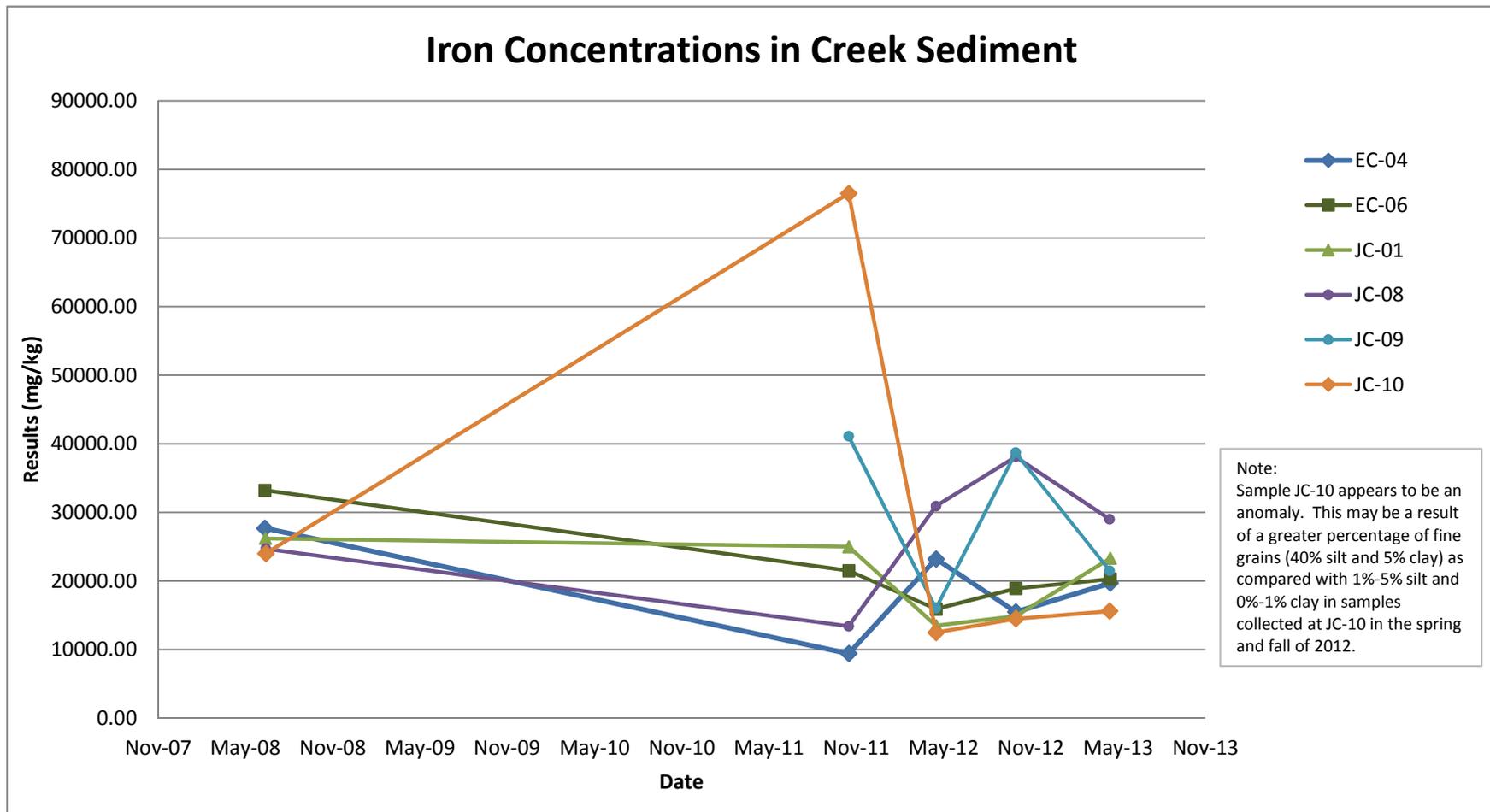


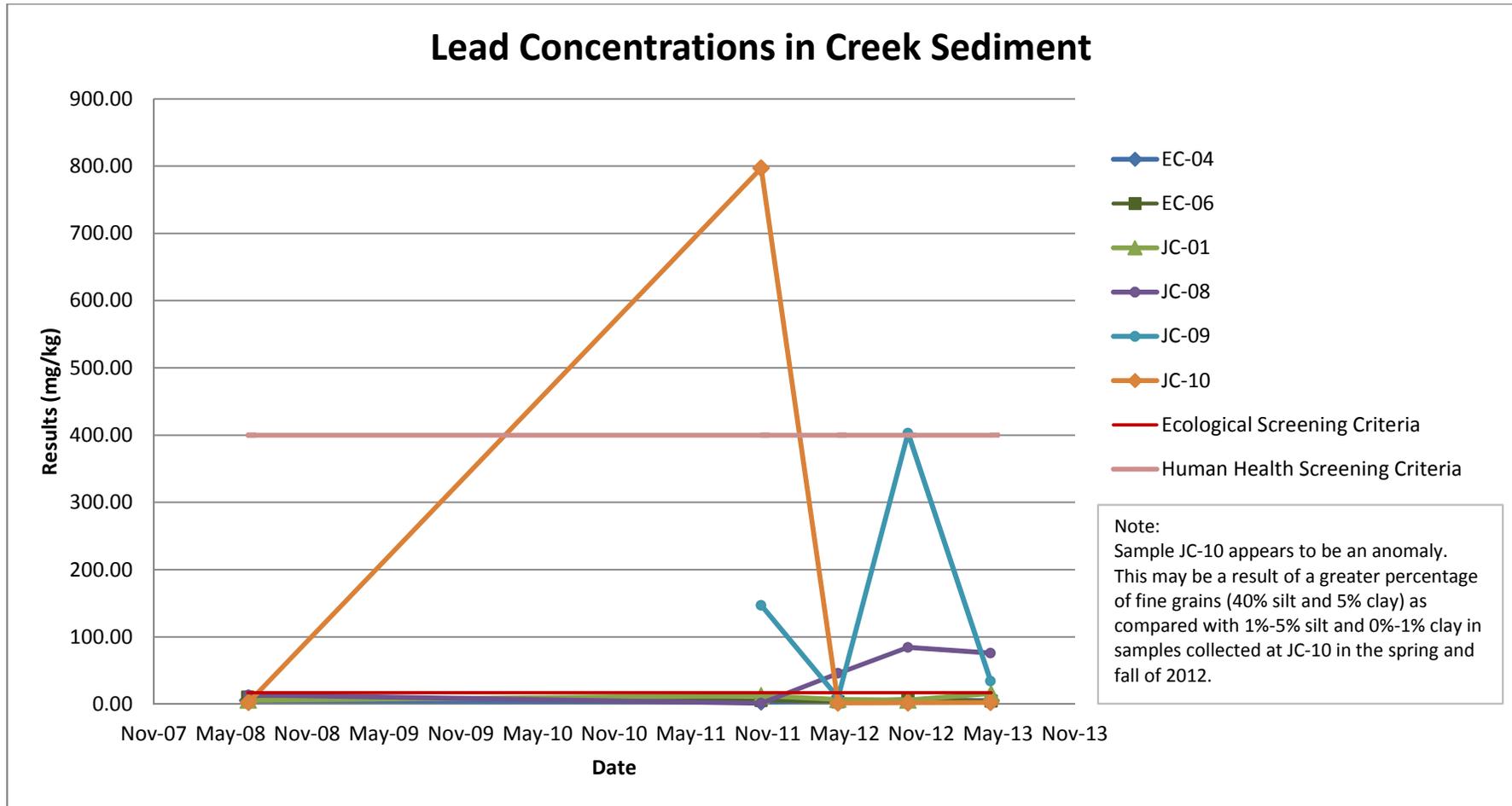


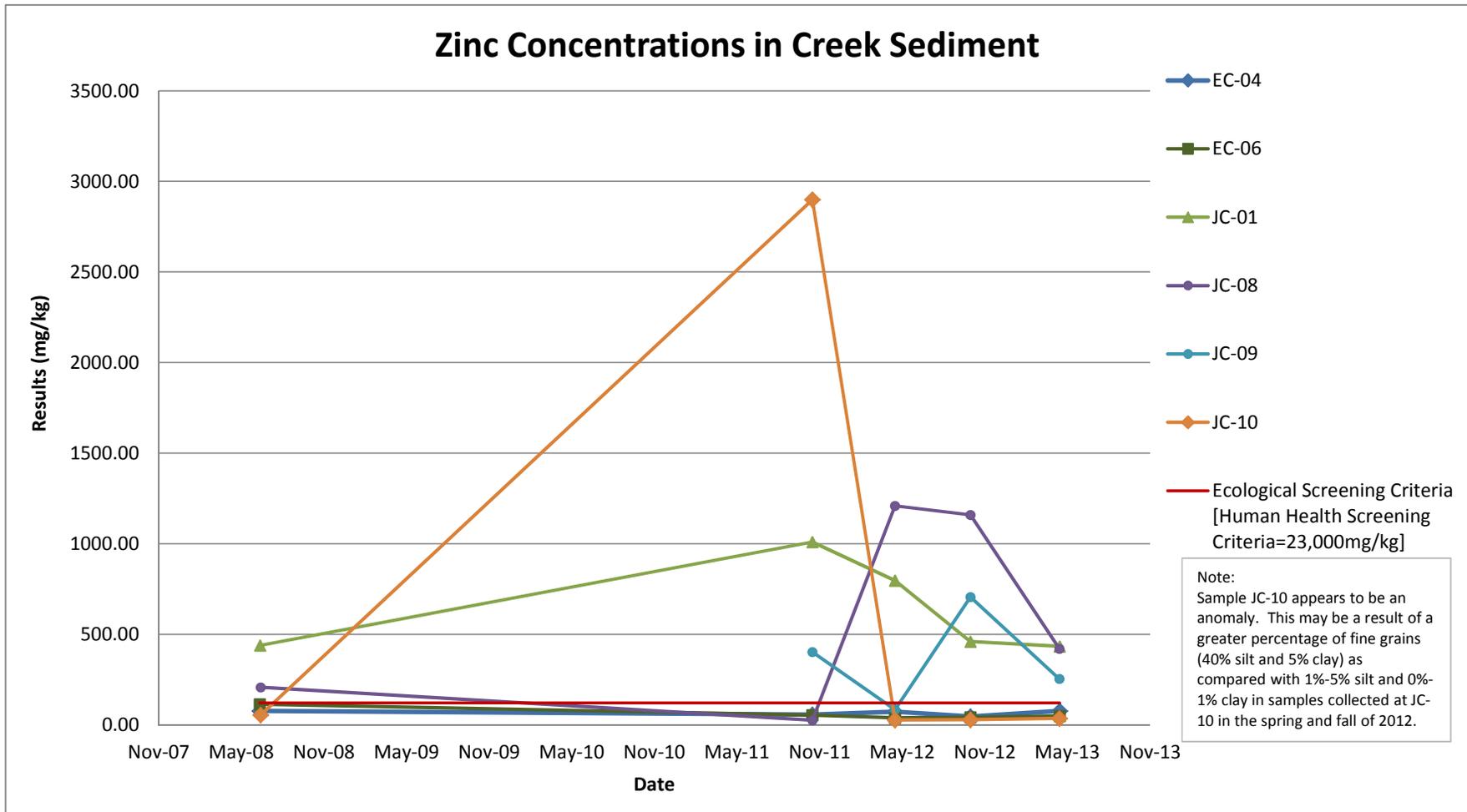












Appendix B. Spring 2013 Laboratory Analytical Reports

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, June 16, 2013

Brain Wetzsteon
Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

RE: Blue Ledge Mine 2013 / 2010-084

Enclosed are the results of analyses for work order A3E0083, which was received by the laboratory on 5/3/2013 at 9:10:00AM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Engineering/Remediation Resource Group, Inc
 4585 Pacheco Blvd, Suite 200 (Corporate address)
 Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BL-TB-03-050113	A3E0083-01	Soil	05/01/13 09:57	05/03/13 09:10
BL-TB-2A,B-050113	A3E0083-04	Soil	05/01/13 10:45	05/03/13 09:10
BL-TB-1E,D,C,B,A-050113	A3E0083-11	Soil	05/01/13 12:01	05/03/13 09:10
BL-SW-JC-10-050113	A3E0083-12	Water	05/01/13 13:43	05/03/13 09:10
BL-CS-JC-10-050113	A3E0083-13	Soil	05/01/13 13:43	05/03/13 09:10
BL-SW-JC-09-050113	A3E0083-14	Water	05/01/13 14:14	05/03/13 09:10
BL-CS-JC-09-050113	A3E0083-15	Soil	05/01/13 14:14	05/03/13 09:10
BL-SW-JC-08-050113-DUP	A3E0083-16	Water	05/01/13 14:31	05/03/13 09:10
BL-SW-JC-08-050113	A3E0083-17	Water	05/01/13 14:31	05/03/13 09:10
BL-CS-JC-09-050113DUP	A3E0083-18	Soil	05/01/13 14:14	05/03/13 09:10
BL-RS-050113	A3E0083-19	Water	05/01/13 15:46	05/03/13 09:10
BL-SW-JC01-050213	A3E0083-20	Water	05/02/13 08:52	05/03/13 09:10
BL-CS-JC01-050213	A3E0083-21	Soil	05/02/13 08:52	05/03/13 09:10
BL-SW-EC06-050213	A3E0083-22	Water	05/02/13 09:18	05/03/13 09:10
BL-CS-EC06-050213	A3E0083-23	Soil	05/02/13 09:18	05/03/13 09:10
BL-DW-12620-050213	A3E0083-24	Water	05/02/13 09:54	05/03/13 09:10
BL-DW-12620irrig-050213	A3E0083-25	Water	05/02/13 09:41	05/03/13 09:10
BL-DW-541-050213	A3E0083-26	Water	05/02/13 10:28	05/03/13 09:10
BL-DW-17607-050213	A3E0083-27	Water	05/02/13 10:37	05/03/13 09:10
BL-DW-17607-050213DUP	A3E0083-28	Water	05/02/13 10:37	05/03/13 09:10
BL-DW-462-050213	A3E0083-29	Water	05/02/13 10:50	05/03/13 09:10
BL-CS-EC04-050213	A3E0083-30	Soil	05/02/13 11:16	05/03/13 09:10
BL-SW-EC04-050213	A3E0083-31	Water	05/02/13 11:16	05/03/13 09:10
BL-CS-JC-08-050113	A3E0083-32	Soil	05/01/13 14:31	05/03/13 09:10

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

ANALYTICAL CASE NARRATIVE

Work Order: A3E0083

Analytical Qualifier Summary

FILT1: pg 10-13

All samples analyzed for Dissolved Metals by EPA 6020 were lab filtered and acid preserved prior to analysis. See sample preparation section of report for date and time of filtration.

FILT3: pg 34

These are laboratory filtration blanks, associated with filtration batch 3050108 for QC samples 3050173-BLK1 and 3050173-BLK2 reported for Dissolved Metals by EPA 6020.

GS-01: pg 17-20

See detailed Particle Size Analysis results, accumulation curves, and Case Narratives at the end of the analytical report for samples A3E0083-13, 15, 18, 21, 23, 30, 32.

H-06: pg 14-15

Sample A3E0083-19 was received, or the analysis requested, outside the recommended holding time for pH analysis by EPA method 150.1.

Q-01: pg 27 & 33

For Total Metals analysis by EPA method 6020, the Spike recoveries are outside acceptance limits in QC samples 3050160-MS2 for Lead and 3050324-MS2 for Zinc.

Q-03: pg 28-29

For Total Metals analysis by EPA method 6020, the Spike recovery in QC samples 3050237-MS1 and 3050237-MSD1 for Copper, Iron and Zinc is outside control limits due to the high concentration of analyte present in the sample. QC sample 305237-MS2 is outside control limits for Copper, Lead and Zinc.

Q-04: pg 26

For Total Metals analysis by EPA method 6020, the Spike recovery for QC sample 3050160-MS1 for Copper and Iron and the RPD for QC sample 3050160-DUP1 for Copper are outside control limits due to a non-homogeneous sample matrix.

Q-16: pg 30-31 & 33

For Total Metals analysis by EPA method 6020, there was reanalysis of the following original Batch QC samples: 3050324-BLK2, 3050324-BS2, 3050324-MS3 and 3050324-MS4 for Cadmium and Mercury.

pg 34-36

For Dissolved Metals analysis by EPA method 6020, there was reanalysis of the following original Batch QC samples: 3050173-BLK2, 3050173-BS2, 3050173-MS3, and 3050173-MSD3 for Calcium and Magnesium.

Q-17: pg 28

For Total Metals analysis by EPA method 6020, the RPD between original (A3E0083-21RE1) and duplicate sample

Apex Laboratories

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Engineering/Remediation Resource Group, Inc

4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**

Project Number: 2010-084

Project Manager: Brain Wetzsteon

Reported:

06/16/13 08:31

(3050237-DUP1) for Arsenic is outside of established control limits.

Q-25: (Qualifier is not listed in report or Data Package. The anomaly will be present in the raw data.)

For Total Metals analysis by EPA method 6020, the recovery of Continuing Calibration Verification standards, 3E15002-CCV3 (Mercury), 3E15002-CCV5 (Selenium), 3E15002-CCV6 (Selenium), 3E15002-CCV7 (Barium and Selenium), and 3E15002-CCV8 (Selenium) were above acceptable limits. The analytes were not detected in the reported client samples; therefore Data Quality is not affected.

Q-42: pg 8

For Total Metals analysis by EPA method 6020, the Duplicate (3050237-DUP1) analysis was performed on this sample (A3E0083-21RE1). The % RPD for Arsenic is outside laboratory control limits. (Refer to Qualifier Q-17 on pg 28 and the QC Section of Analytical Report.)

R-04: pg 7

For Total Metals analysis by EPA method 6020, sample A3E0083-19 has elevated reporting levels for the following metals due to dilution necessary for analysis: Antimony, Arsenic, Beryllium, Chromium, Lead, Mercury, Molybdenum, Selenium, Silver, Thallium, and Vanadium.

Christina Woodcock

Project Manager

June 13, 2013

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Reported:
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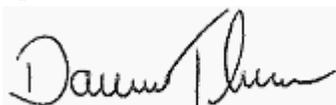
ANALYTICAL SAMPLE RESULTS

Anions by EPA 300.0/9056A (Ion Chromatography)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-SW-JC-10-050113 (A3E0083-12)			Matrix: Water					
Batch: 3050120								
Sulfate	2.64	---	1.00	mg/L	1	05/06/13 10:36	EPA 300.0	
BL-SW-JC-09-050113 (A3E0083-14)			Matrix: Water					
Batch: 3050120								
Sulfate	2.73	---	1.00	mg/L	1	05/06/13 11:37	EPA 300.0	
BL-SW-JC-08-050113-DUP (A3E0083-16)			Matrix: Water					
Batch: 3050120								
Sulfate	3.40	---	1.00	mg/L	1	05/06/13 11:57	EPA 300.0	
BL-SW-JC-08-050113 (A3E0083-17)			Matrix: Water					
Batch: 3050120								
Sulfate	3.33	---	1.00	mg/L	1	05/06/13 12:17	EPA 300.0	
BL-SW-JC01-050213 (A3E0083-20)			Matrix: Water					
Batch: 3050120								
Sulfate	5.16	---	1.00	mg/L	1	05/06/13 12:38	EPA 300.0	
BL-SW-EC06-050213 (A3E0083-22)			Matrix: Water					
Batch: 3050120								
Sulfate	2.87	---	1.00	mg/L	1	05/06/13 12:58	EPA 300.0	
BL-DW-12620-050213 (A3E0083-24)			Matrix: Water					
Batch: 3050120								
Sulfate	21.6	---	1.00	mg/L	1	05/06/13 13:59	EPA 300.0	
BL-DW-12620irrig-050213 (A3E0083-25)			Matrix: Water					
Batch: 3050120								
Sulfate	10.2	---	1.00	mg/L	1	05/06/13 14:20	EPA 300.0	
BL-DW-541-050213 (A3E0083-26)			Matrix: Water					
Batch: 3050120								
Sulfate	21.3	---	1.00	mg/L	1	05/06/13 14:40	EPA 300.0	
BL-DW-17607-050213 (A3E0083-27)			Matrix: Water					
Batch: 3050120								
Sulfate	17.0	---	1.00	mg/L	1	05/06/13 15:41	EPA 300.0	
BL-DW-17607-050213DUP (A3E0083-28)			Matrix: Water					
Batch: 3050120								
Sulfate	17.2	---	1.00	mg/L	1	05/06/13 16:02	EPA 300.0	

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 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Anions by EPA 300.0/9056A (Ion Chromatography)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-DW-462-050213 (A3E0083-29)			Matrix: Water					
Batch: 3050120								
Sulfate	35.4	---	1.00	mg/L	1	05/06/13 16:22	EPA 300.0	
BL-SW-EC04-050213 (A3E0083-31)			Matrix: Water					
Batch: 3050120								
Sulfate	3.11	---	1.00	mg/L	1	05/06/13 16:42	EPA 300.0	

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Reported:
06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Dissolved Hardness (Calculated) by EPA 6020

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-SW-JC-10-050113 (A3E0083-12)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	23.4	---	0.456	mg CaCO3/L	1	05/09/13 16:09	6020 Calc	
BL-SW-JC-09-050113 (A3E0083-14)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	20.8	---	0.456	mg CaCO3/L	1	05/09/13 16:35	6020 Calc	
BL-SW-JC-08-050113-DUP (A3E0083-16)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	21.0	---	0.456	mg CaCO3/L	1	05/09/13 16:38	6020 Calc	
BL-SW-JC-08-050113 (A3E0083-17)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	20.9	---	0.456	mg CaCO3/L	1	05/09/13 16:41	6020 Calc	
BL-SW-JC01-050213 (A3E0083-20)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	42.0	---	0.456	mg CaCO3/L	1	05/09/13 16:45	6020 Calc	
BL-SW-EC06-050213 (A3E0083-22)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	42.4	---	0.456	mg CaCO3/L	1	05/09/13 16:48	6020 Calc	
BL-DW-12620-050213 (A3E0083-24)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	279	---	1.45	mg CaCO3/L	5	05/09/13 17:32	6020 Calc	
BL-DW-12620irrig-050213 (A3E0083-25)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	215	---	1.45	mg CaCO3/L	5	05/09/13 17:35	6020 Calc	
BL-DW-541-050213 (A3E0083-26)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	257	---	1.45	mg CaCO3/L	5	05/09/13 17:38	6020 Calc	
BL-DW-17607-050213 (A3E0083-27)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	233	---	1.45	mg CaCO3/L	5	05/09/13 17:47	6020 Calc	
BL-DW-17607-050213DUP (A3E0083-28)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	240	---	1.45	mg CaCO3/L	5	05/09/13 17:50	6020 Calc	
BL-DW-462-050213 (A3E0083-29)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	199	---	1.45	mg CaCO3/L	5	05/09/13 17:53	6020 Calc	
BL-SW-EC04-050213 (A3E0083-31)			Matrix: Water		Batch: [CALC]			
Hardness (Calc by 6020)	42.5	---	0.456	mg CaCO3/L	1	05/09/13 17:29	6020 Calc	

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Reported:
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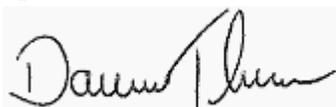
ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting		Units	Dilution	Date Analyzed	Method	Notes
			Limit						
BL-TB-03-050113 (A3E0083-01)			Matrix: Soil						
Batch: 3050160									
Arsenic	15.0	0.766	1.53		mg/kg dry	5	05/08/13 10:44	EPA 6020A	
Cadmium	2.83	0.153	0.306		"	"	"	"	
Copper	1640	1.53	3.06		"	"	"	"	
Iron	24000	---	76.6		"	"	"	"	
Lead	86.9	0.766	1.53		"	"	"	"	
Zinc	446	3.06	6.13		"	"	"	"	
BL-TB-2A,B-050113 (A3E0083-04)			Matrix: Soil						
Batch: 3050160									
Arsenic	21.9	0.325	0.651		mg/kg dry	5	05/08/13 10:47	EPA 6020A	
Cadmium	1.53	0.0651	0.130		"	"	"	"	
Copper	731	0.651	1.30		"	"	"	"	
Iron	35300	---	65.1		"	10	05/08/13 11:27	"	
Lead	83.1	0.325	0.651		"	5	05/08/13 10:47	"	
Zinc	383	1.30	2.60		"	"	"	"	
BL-TB-1F,E,D,C,B,A-050113 (A3E0083-11)			Matrix: Soil						
Batch: 3050160									
Arsenic	56.2	0.425	0.851		mg/kg dry	5	05/08/13 10:50	EPA 6020A	
Cadmium	1.57	0.0851	0.170		"	"	"	"	
Copper	957	0.851	1.70		"	"	"	"	
Iron	73600	---	85.1		"	10	05/08/13 11:31	"	
Lead	188	0.425	0.851		"	5	05/08/13 10:50	"	
Zinc	313	1.70	3.40		"	"	"	"	
BL-CS-JC-10-050113 (A3E0083-13)			Matrix: Soil						
Batch: 3050160									
Arsenic	2.56	0.452	0.903		mg/kg dry	5	05/09/13 14:58	EPA 6020A	
Cadmium	0.235	0.0903	0.181		"	"	"	"	
Copper	50.5	0.903	1.81		"	"	"	"	
Iron	15600	---	45.2		"	"	"	"	
Lead	2.66	0.452	0.903		"	"	"	"	
Zinc	36.3	1.81	3.61		"	"	"	"	
BL-CS-JC-09-050113 (A3E0083-15)			Matrix: Soil						
Batch: 3050160									
Arsenic	13.2	0.338	0.676		mg/kg dry	5	05/08/13 11:09	EPA 6020A	
Cadmium	1.54	0.0676	0.135		"	"	"	"	

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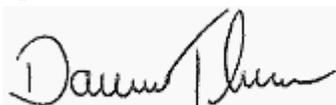
ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting		Units	Dilution	Date Analyzed	Method	Notes
			Limit	Matrix					
BL-CS-JC-09-050113 (A3E0083-15)			Matrix: Soil						
Copper	555	0.676	1.35		mg/kg dry	5	"	EPA 6020A	
Iron	21500	---	33.8		"	"	"	"	
Lead	34.2	0.338	0.676		"	"	"	"	
Zinc	254	1.35	2.71		"	"	"	"	
BL-CS-JC-09-050113DUP (A3E0083-18)			Matrix: Soil						
Batch: 3050160									
Arsenic	9.69	0.343	0.686		mg/kg dry	5	05/08/13 11:12	EPA 6020A	
Cadmium	0.686	0.0686	0.137		"	"	"	"	
Copper	222	0.686	1.37		"	"	"	"	
Iron	15300	---	34.3		"	"	"	"	
Lead	29.7	0.343	0.686		"	"	"	"	
Zinc	145	1.37	2.74		"	"	"	"	
BL-RS-050113 (A3E0083-19)			Matrix: Water						
Batch: 3050324									
Antimony	ND	5.00	10.0		ug/L	10	05/14/13 19:51	EPA 6020A	R-04, U
Arsenic	ND	---	20.0		"	"	"	"	R-04
Barium	15.2	5.00	10.0		"	"	"	"	
Beryllium	ND	5.00	10.0		"	"	"	"	U, R-04
Cadmium	35.1	---	2.00		"	"	05/15/13 13:19	"	
Chromium	ND	5.00	20.0		"	"	05/14/13 19:51	"	R-04, U
Cobalt	2600	5.00	10.0		"	"	"	"	
Copper	142	---	20.0		"	"	"	"	
Lead	ND	---	10.0		"	"	"	"	R-04
Mercury	ND	0.400	0.800		"	"	05/15/13 13:19	"	R-04, U
Molybdenum	ND	10.0	20.0		"	"	05/14/13 19:51	"	R-04, U
Nickel	2150	5.00	20.0		"	"	"	"	
Selenium	ND	10.0	20.0		"	"	"	"	R-04, U
Silver	ND	5.00	10.0		"	"	"	"	U, R-04
Thallium	ND	5.00	10.0		"	"	"	"	R-04, U
Vanadium	ND	10.0	20.0		"	"	"	"	R-04, U
Zinc	153000	---	400		"	100	05/15/13 13:13	"	
BL-CS-JC01-050213 (A3E0083-21)			Matrix: Soil						
Batch: 3050160									
Arsenic	5.38	0.327	0.653		mg/kg dry	5	05/08/13 11:15	EPA 6020A	
Cadmium	2.32	0.0653	0.131		"	"	"	"	

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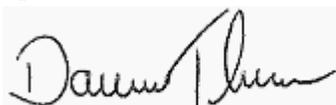
ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
BL-CS-JC01-050213 (A3E0083-21)			Matrix: Soil					
Copper	621	0.653	1.31	mg/kg dry	5	"	EPA 6020A	
Iron	23300	---	32.7	"	"	"	"	
Lead	15.7	0.327	0.653	"	"	"	"	
Zinc	433	1.31	2.61	"	"	"	"	
BL-CS-JC01-050213 (A3E0083-21RE1)			Matrix: Soil					
Batch: 3050237								
Arsenic	4.37	0.343	0.686	mg/kg dry	5	05/10/13 11:32	EPA 6020A	Q-42
Cadmium	2.40	0.0686	0.137	"	"	"	"	
Copper	585	0.686	1.37	"	"	"	"	
Iron	17000	---	34.3	"	"	"	"	
Lead	16.3	0.343	0.686	"	"	"	"	
Zinc	602	1.37	2.75	"	"	"	"	
BL-CS-EC06-050213 (A3E0083-23)			Matrix: Soil					
Batch: 3050160								
Arsenic	5.65	0.354	0.708	mg/kg dry	5	05/08/13 11:18	EPA 6020A	
Cadmium	0.212	0.0708	0.142	"	"	"	"	
Copper	39.2	0.708	1.42	"	"	"	"	
Iron	20300	---	35.4	"	"	"	"	
Lead	4.88	0.354	0.708	"	"	"	"	
Zinc	49.5	1.42	2.83	"	"	"	"	
BL-CS-EC04-050213 (A3E0083-30)			Matrix: Soil					
Batch: 3050160								
Arsenic	6.70	0.315	0.630	mg/kg dry	5	05/08/13 11:21	EPA 6020A	
Cadmium	0.309	0.0630	0.126	"	"	"	"	
Copper	113	0.630	1.26	"	"	"	"	
Iron	19700	---	31.5	"	"	"	"	
Lead	5.34	0.315	0.630	"	"	"	"	
Zinc	76.9	1.26	2.52	"	"	"	"	
BL-CS-JC-08-050113 (A3E0083-32)			Matrix: Soil					
Batch: 3050160								
Arsenic	25.2	0.309	0.619	mg/kg dry	5	05/08/13 11:24	EPA 6020A	
Cadmium	2.85	0.0619	0.124	"	"	"	"	
Copper	769	0.619	1.24	"	"	"	"	
Iron	29000	---	30.9	"	"	"	"	
Lead	75.9	0.309	0.619	"	"	"	"	

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Reported:
 06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-CS-JC-08-050113 (A3E0083-32)								
Matrix: Soil								
Zinc	420	1.24	2.48	mg/kg dry	5	"	EPA 6020A	

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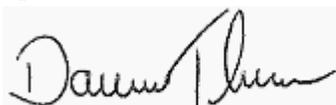
ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting		Units	Dilution	Date Analyzed	Method	Notes
			Limit						
BL-SW-JC-10-050113 (A3E0083-12)			Matrix: Water						
Batch: 3050173									
Arsenic	ND	0.250	0.500		ug/L	1	05/13/13 12:14	EPA 6020A (Diss)	
Cadmium	ND	0.0400	0.200		"	"	05/08/13 13:26	"	FILT1
Calcium	7390	50.0	100		"	"	05/09/13 16:09	"	FILT1
Copper	ND	1.00	2.00		"	"	05/08/13 13:26	"	FILT1, U
Iron	225	25.0	50.0		"	"	"	"	FILT1
Lead	ND	0.500	1.00		"	"	"	"	FILT1, U
Magnesium	1210	25.0	50.0		"	"	05/09/13 16:09	"	FILT1
Zinc	ND	2.00	4.00		"	"	05/08/13 13:26	"	FILT1, U
BL-SW-JC-09-050113 (A3E0083-14)			Matrix: Water						
Batch: 3050173									
Arsenic	ND	0.250	0.500		ug/L	1	05/13/13 12:22	EPA 6020A (Diss)	
Cadmium	0.0444	0.0400	0.200		"	"	05/08/13 13:41	"	FILT1, J
Calcium	6640	50.0	100		"	"	05/09/13 16:35	"	FILT1
Copper	3.13	1.00	2.00		"	"	05/08/13 13:41	"	FILT1
Iron	198	25.0	50.0		"	"	"	"	FILT1
Lead	ND	0.500	1.00		"	"	"	"	FILT1, U
Magnesium	1010	25.0	50.0		"	"	05/09/13 16:35	"	FILT1
Zinc	6.80	2.00	4.00		"	"	05/08/13 13:41	"	FILT1
BL-SW-JC-08-050113-DUP (A3E0083-16)			Matrix: Water						
Batch: 3050173									
Arsenic	ND	0.250	0.500		ug/L	1	05/13/13 12:25	EPA 6020A (Diss)	
Cadmium	0.189	0.0400	0.200		"	"	05/08/13 13:44	"	FILT1, J
Calcium	6720	50.0	100		"	"	05/09/13 16:38	"	FILT1
Copper	18.1	1.00	2.00		"	"	05/08/13 13:44	"	FILT1
Iron	200	25.0	50.0		"	"	"	"	FILT1
Lead	ND	0.500	1.00		"	"	"	"	FILT1, U
Magnesium	1020	25.0	50.0		"	"	05/09/13 16:38	"	FILT1
Zinc	31.5	2.00	4.00		"	"	05/08/13 13:44	"	FILT1
BL-SW-JC-08-050113 (A3E0083-17)			Matrix: Water						
Batch: 3050173									
Arsenic	ND	0.250	0.500		ug/L	1	05/13/13 12:28	EPA 6020A (Diss)	
Cadmium	0.189	0.0400	0.200		"	"	05/08/13 13:47	"	FILT1, J
Calcium	6710	50.0	100		"	"	05/09/13 16:41	"	FILT1
Copper	17.4	1.00	2.00		"	"	05/08/13 13:47	"	FILT1

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Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

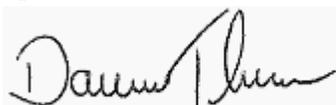
ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting		Units	Dilution	Date Analyzed	Method	Notes
			Limit						
BL-SW-JC-08-050113 (A3E0083-17)			Matrix: Water						
Iron	201	25.0	50.0		ug/L	1	"	EPA 6020A (Diss)	FILT1
Lead	ND	0.500	1.00		"	"	"	"	FILT1, U
Magnesium	1010	25.0	50.0		"	"	05/09/13 16:41	"	FILT1
Zinc	30.2	2.00	4.00		"	"	05/08/13 13:47	"	FILT1
BL-SW-JC01-050213 (A3E0083-20)			Matrix: Water						
Batch: 3050173									
Arsenic	ND	0.250	0.500		ug/L	1	05/13/13 12:31	EPA 6020A (Diss)	
Cadmium	0.322	0.0400	0.200		"	"	05/09/13 16:45	"	FILT1
Calcium	12900	50.0	100		"	"	"	"	FILT1
Copper	18.9	1.00	2.00		"	"	"	"	FILT1
Iron	295	25.0	50.0		"	"	"	"	FILT1
Lead	ND	0.500	1.00		"	"	"	"	FILT1, U
Magnesium	2400	25.0	50.0		"	"	"	"	FILT1
Zinc	44.8	2.00	4.00		"	"	"	"	FILT1
BL-SW-EC06-050213 (A3E0083-22)			Matrix: Water						
Batch: 3050173									
Arsenic	0.378	0.250	0.500		ug/L	1	05/13/13 12:34	EPA 6020A (Diss)	J
Cadmium	ND	0.0400	0.200		"	"	05/09/13 16:48	"	FILT1
Calcium	10300	50.0	100		"	"	"	"	FILT1
Copper	ND	1.00	2.00		"	"	"	"	FILT1, U
Iron	244	25.0	50.0		"	"	"	"	FILT1
Lead	ND	0.500	1.00		"	"	"	"	FILT1, U
Magnesium	4030	25.0	50.0		"	"	"	"	FILT1
Zinc	ND	2.00	4.00		"	"	"	"	FILT1, U
BL-DW-12620-050213 (A3E0083-24)			Matrix: Water						
Batch: 3050173									
Arsenic	4.17	0.250	0.500		ug/L	1	05/13/13 12:42	EPA 6020A (Diss)	
Cadmium	ND	0.0400	0.200		"	"	05/09/13 16:51	"	FILT1
Calcium	90800	250	500		"	5	05/09/13 17:32	"	FILT1
Copper	1.16	1.00	2.00		"	1	05/09/13 16:51	"	FILT1, J
Iron	2170	25.0	50.0		"	"	"	"	FILT1
Lead	ND	0.500	1.00		"	"	"	"	FILT1, U
Magnesium	12700	25.0	50.0		"	"	"	"	FILT1
Zinc	13.0	2.00	4.00		"	"	"	"	FILT1
BL-DW-12620irrig-050213 (A3E0083-25)			Matrix: Water						

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Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-DW-12620irrig-050213 (A3E0083-25) Matrix: Water								
Batch: 3050173								
Arsenic	ND	0.250	0.500	ug/L	1	05/13/13 12:50	EPA 6020A (Diss)	
Cadmium	ND	0.0400	0.200	"	"	05/09/13 16:54	"	FILT1
Calcium	65000	250	500	"	5	05/09/13 17:35	"	FILT1
Copper	1.37	1.00	2.00	"	1	05/09/13 16:54	"	FILT1, J
Iron	1520	25.0	50.0	"	"	"	"	FILT1
Lead	ND	0.500	1.00	"	"	"	"	FILT1, U
Magnesium	12700	25.0	50.0	"	"	"	"	FILT1
Zinc	27.0	2.00	4.00	"	"	"	"	FILT1
BL-DW-541-050213 (A3E0083-26) Matrix: Water								
Batch: 3050173								
Arsenic	5.96	0.250	0.500	ug/L	1	05/13/13 12:55	EPA 6020A (Diss)	
Cadmium	0.133	0.0400	0.200	"	"	05/09/13 16:57	"	FILT1, J
Calcium	74400	250	500	"	5	05/09/13 17:38	"	FILT1
Copper	6.76	1.00	2.00	"	1	05/09/13 16:57	"	FILT1
Iron	1760	25.0	50.0	"	"	"	"	FILT1
Lead	0.522	0.500	1.00	"	"	"	"	FILT1, J
Magnesium	17200	25.0	50.0	"	"	"	"	FILT1
Zinc	210	2.00	4.00	"	"	"	"	FILT1
BL-DW-17607-050213 (A3E0083-27) Matrix: Water								
Batch: 3050173								
Arsenic	ND	0.250	0.500	ug/L	1	05/13/13 13:04	EPA 6020A (Diss)	
Cadmium	ND	0.0400	0.200	"	"	05/09/13 17:20	"	FILT1
Calcium	57600	250	500	"	5	05/09/13 17:47	"	FILT1
Copper	ND	1.00	2.00	"	1	05/09/13 17:20	"	U, FILT1
Iron	1360	25.0	50.0	"	"	"	"	FILT1
Lead	ND	0.500	1.00	"	"	"	"	FILT1, U
Magnesium	21700	25.0	50.0	"	"	"	"	FILT1
Zinc	ND	2.00	4.00	"	"	"	"	FILT1, U
BL-DW-17607-050213DUP (A3E0083-28) Matrix: Water								
Batch: 3050173								
Arsenic	ND	0.250	0.500	ug/L	1	05/13/13 13:06	EPA 6020A (Diss)	
Cadmium	ND	0.0400	0.200	"	"	05/09/13 17:23	"	FILT1
Calcium	60100	250	500	"	5	05/09/13 17:50	"	FILT1
Copper	ND	1.00	2.00	"	1	05/09/13 17:23	"	FILT1, U

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Reported:
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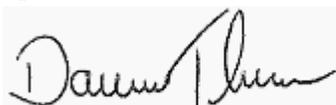
ANALYTICAL SAMPLE RESULTS

Dissolved Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-DW-17607-050213DUP (A3E0083-28)			Matrix: Water					
Iron	1380	25.0	50.0	ug/L	1	"	EPA 6020A (Diss)	FILT1
Lead	ND	0.500	1.00	"	"	"	"	FILT1, U
Magnesium	21800	25.0	50.0	"	"	"	"	FILT1
Zinc	ND	2.00	4.00	"	"	"	"	FILT1, U
BL-DW-462-050213 (A3E0083-29)			Matrix: Water					
Batch: 3050173								
Arsenic	1.44	0.250	0.500	ug/L	1	05/13/13 13:09	EPA 6020A (Diss)	
Cadmium	0.0556	0.0400	0.200	"	"	05/09/13 17:26	"	FILT1, J
Calcium	63100	250	500	"	5	05/09/13 17:53	"	FILT1
Copper	21.7	1.00	2.00	"	1	05/09/13 17:26	"	FILT1
Iron	1490	25.0	50.0	"	"	"	"	FILT1
Lead	0.867	0.500	1.00	"	"	"	"	FILT1, J
Magnesium	10000	25.0	50.0	"	"	"	"	FILT1
Zinc	18.4	2.00	4.00	"	"	"	"	FILT1
BL-SW-EC04-050213 (A3E0083-31)			Matrix: Water					
Batch: 3050173								
Arsenic	0.367	0.250	0.500	ug/L	1	05/13/13 13:12	EPA 6020A (Diss)	J
Cadmium	ND	0.0400	0.200	"	"	05/09/13 17:29	"	FILT1
Calcium	10500	50.0	100	"	"	"	"	FILT1
Copper	2.43	1.00	2.00	"	"	"	"	FILT1
Iron	249	25.0	50.0	"	"	"	"	FILT1
Lead	ND	0.500	1.00	"	"	"	"	FILT1, U
Magnesium	3940	25.0	50.0	"	"	"	"	FILT1
Zinc	4.88	2.00	4.00	"	"	"	"	FILT1

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Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
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ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-TB-03-050113 (A3E0083-01)			Matrix: Soil					
Batch: 3050170								
Soil pH (measured in H2O)	6.52	---		pH Units	1	05/07/13 13:46	EPA 9045D	
pH Temperature (deg C)	24.2	---		"	"	"	"	
BL-TB-2A,B-050113 (A3E0083-04)			Matrix: Soil					
Batch: 3050170								
Soil pH (measured in H2O)	5.99	---		pH Units	1	05/07/13 13:49	EPA 9045D	
pH Temperature (deg C)	23.8	---		"	"	"	"	
BL-TB-1F,E,D,C,B,A-050113 (A3E0083-11)			Matrix: Soil					
Batch: 3050170								
Soil pH (measured in H2O)	4.18	---		pH Units	1	05/07/13 13:50	EPA 9045D	
pH Temperature (deg C)	23.7	---		"	"	"	"	
BL-SW-JC-10-050113 (A3E0083-12)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	20.0	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-SW-JC-09-050113 (A3E0083-14)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	ND	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-SW-JC-08-050113-DUP (A3E0083-16)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	21.0	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-SW-JC-08-050113 (A3E0083-17)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	18.0	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-RS-050113 (A3E0083-19)			Matrix: Water					
Batch: 3050100								
pH	3.26	---		pH Units	1	05/03/13 15:47	EPA 150.1	H-06

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Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-RS-050113 (A3E0083-19)			Matrix: Water					
pH Temperature (deg C)	23.1	---		pH Units	1	"	EPA 150.1	H-06
BL-SW-JC01-050213 (A3E0083-20)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	39.0	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-SW-EC06-050213 (A3E0083-22)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	40.0	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	7.00	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-DW-12620-050213 (A3E0083-24)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	299	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-DW-12620irrig-050213 (A3E0083-25)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	211	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-DW-541-050213 (A3E0083-26)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	268	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-DW-17607-050213 (A3E0083-27)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	244	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-DW-17607-050213DUP (A3E0083-28)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	231	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	

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ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-DW-17607-050213DUP (A3E0083-28)			Matrix: Water					
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	mg/L	1	05/07/13 12:00	SM 2540 D	
BL-DW-462-050213 (A3E0083-29)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	229	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	
BL-SW-EC04-050213 (A3E0083-31)			Matrix: Water					
Batch: 3050122								
Total Dissolved Solids	33.0	---	10.0	mg/L	1	05/08/13 15:04	SM 2540 C	
Batch: 3050123								
Total Suspended Solids	ND	---	5.00	"	"	05/07/13 12:00	SM 2540 D	

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ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
BL-CS-JC-10-050113 (A3E0083-13)			Matrix: Soil		Batch: 3050258			
Percent Retained 4.75 mm sieve (#4)	43.42	---		% of Total	1	05/09/13 11:34	ASTM D 422m	GS-01
Percent Retained 2.00 mm sieve (#10)	22.03	---		"	"	"	"	GS-01
Percent Retained 0.85 mm sieve (#20)	20.89	---		"	"	"	"	GS-01
Percent Retained 0.425 mm sieve (#40)	8.69	---		"	"	"	"	GS-01
Percent Retained 0.250 mm sieve (#60)	2.29	---		"	"	"	"	GS-01
Percent Retained 0.150 mm sieve (#100)	0.83	---		"	"	"	"	GS-01
Percent Retained 0.106 mm sieve (#140)	0.34	---		"	"	"	"	GS-01
Percent Retained 0.075 mm sieve (#200)	0.35	---		"	"	"	"	GS-01
Percent Retained 0.063 mm sieve (#230)	0.15	---		"	"	"	"	GS-01
Silt (> 0.005 mm < 0.063 mm)	1.10	---		"	"	"	"	GS-01
Clay (< 0.005 mm)	0.10	---		"	"	"	"	GS-01
BL-CS-JC-09-050113 (A3E0083-15)			Matrix: Soil		Batch: 3050258			
Percent Retained 4.75 mm sieve (#4)	11.38	---		% of Total	1	05/09/13 12:04	ASTM D 422m	GS-01
Percent Retained 2.00 mm sieve (#10)	16.90	---		"	"	"	"	GS-01
Percent Retained 0.85 mm sieve (#20)	20.92	---		"	"	"	"	GS-01
Percent Retained 0.425 mm sieve (#40)	18.34	---		"	"	"	"	GS-01
Percent Retained 0.250 mm sieve (#60)	11.40	---		"	"	"	"	GS-01
Percent Retained 0.150 mm sieve (#100)	7.38	---		"	"	"	"	GS-01
Percent Retained 0.106 mm sieve (#140)	3.18	---		"	"	"	"	GS-01
Percent Retained 0.075 mm sieve (#200)	2.53	---		"	"	"	"	GS-01
Percent Retained 0.063 mm sieve (#230)	0.96	---		"	"	"	"	GS-01
Silt (> 0.005 mm < 0.063 mm)	6.90	---		"	"	"	"	GS-01
Clay (< 0.005 mm)	1.10	---		"	"	"	"	GS-01

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ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-CS-JC-09-050113DUP (A3E0083-18)			Matrix: Soil		Batch: 3050258			
Percent Retained 4.75 mm sieve (#4)	30.92	---		% of Total	1	05/09/13 12:26	ASTM D 422m	GS-01
Percent Retained 2.00 mm sieve (#10)	13.68	---		"	"	"	"	GS-01
Percent Retained 0.85 mm sieve (#20)	12.38	---		"	"	"	"	GS-01
Percent Retained 0.425 mm sieve (#40)	12.14	---		"	"	"	"	GS-01
Percent Retained 0.250 mm sieve (#60)	9.41	---		"	"	"	"	GS-01
Percent Retained 0.150 mm sieve (#100)	7.87	---		"	"	"	"	GS-01
Percent Retained 0.106 mm sieve (#140)	3.82	---		"	"	"	"	GS-01
Percent Retained 0.075 mm sieve (#200)	3.04	---		"	"	"	"	GS-01
Percent Retained 0.063 mm sieve (#230)	1.07	---		"	"	"	"	GS-01
Silt (> 0.005 mm < 0.063 mm)	6.20	---		"	"	"	"	GS-01
Clay (< 0.005 mm)	0.50	---		"	"	"	"	GS-01
BL-CS-JC01-050213 (A3E0083-21)			Matrix: Soil		Batch: 3050258			
Percent Retained 4.75 mm sieve (#4)	0.00	---		% of Total	1	05/09/13 12:53	ASTM D 422m	GS-01
Percent Retained 2.00 mm sieve (#10)	2.40	---		"	"	"	"	GS-01
Percent Retained 0.85 mm sieve (#20)	13.62	---		"	"	"	"	GS-01
Percent Retained 0.425 mm sieve (#40)	21.12	---		"	"	"	"	GS-01
Percent Retained 0.250 mm sieve (#60)	21.15	---		"	"	"	"	GS-01
Percent Retained 0.150 mm sieve (#100)	21.40	---		"	"	"	"	GS-01
Percent Retained 0.106 mm sieve (#140)	8.55	---		"	"	"	"	GS-01
Percent Retained 0.075 mm sieve (#200)	5.22	---		"	"	"	"	GS-01
Percent Retained 0.063 mm sieve (#230)	1.46	---		"	"	"	"	GS-01
Silt (> 0.005 mm < 0.063 mm)	5.10	---		"	"	"	"	GS-01
Clay (< 0.005 mm)	1.40	---		"	"	"	"	GS-01

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Reported:
06/16/13 08:31

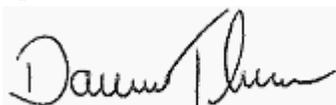
ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
BL-CS-EC06-050213 (A3E0083-23)			Matrix: Soil		Batch: 3050258			
Percent Retained 4.75 mm sieve (#4)	0.00	---		% of Total	1	05/09/13 13:19	ASTM D 422m	GS-01
Percent Retained 2.00 mm sieve (#10)	0.15	---		"	"	"	"	GS-01
Percent Retained 0.85 mm sieve (#20)	4.92	---		"	"	"	"	GS-01
Percent Retained 0.425 mm sieve (#40)	25.61	---		"	"	"	"	GS-01
Percent Retained 0.250 mm sieve (#60)	35.86	---		"	"	"	"	GS-01
Percent Retained 0.150 mm sieve (#100)	21.63	---		"	"	"	"	GS-01
Percent Retained 0.106 mm sieve (#140)	5.17	---		"	"	"	"	GS-01
Percent Retained 0.075 mm sieve (#200)	2.47	---		"	"	"	"	GS-01
Percent Retained 0.063 mm sieve (#230)	0.65	---		"	"	"	"	GS-01
Silt (> 0.005 mm < 0.063 mm)	3.60	---		"	"	"	"	GS-01
Clay (< 0.005 mm)	0.60	---		"	"	"	"	GS-01
BL-CS-EC04-050213 (A3E0083-30)			Matrix: Soil		Batch: 3050258			
Percent Retained 4.75 mm sieve (#4)	4.73	---		% of Total	1	05/09/13 14:16	ASTM D 422m	GS-01
Percent Retained 2.00 mm sieve (#10)	5.63	---		"	"	"	"	GS-01
Percent Retained 0.85 mm sieve (#20)	19.93	---		"	"	"	"	GS-01
Percent Retained 0.425 mm sieve (#40)	29.37	---		"	"	"	"	GS-01
Percent Retained 0.250 mm sieve (#60)	19.25	---		"	"	"	"	GS-01
Percent Retained 0.150 mm sieve (#100)	12.09	---		"	"	"	"	GS-01
Percent Retained 0.106 mm sieve (#140)	3.29	---		"	"	"	"	GS-01
Percent Retained 0.075 mm sieve (#200)	1.98	---		"	"	"	"	GS-01
Percent Retained 0.063 mm sieve (#230)	0.64	---		"	"	"	"	GS-01
Silt (> 0.005 mm < 0.063 mm)	3.10	---		"	"	"	"	GS-01
Clay (< 0.005 mm)	0.70	---		"	"	"	"	GS-01

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Engineering/Remediation Resource Group, Inc
 4585 Pacheco Blvd, Suite 200 (Corporate address)
 Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Grain Size by ASTM D 422

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-CS-JC-08-050113 (A3E0083-32)			Matrix: Soil		Batch: 3050258			
Percent Retained 4.75 mm sieve (#4)	31.51	---		% of Total	1	05/09/13 13:56	ASTM D 422m	GS-01
Percent Retained 2.00 mm sieve (#10)	24.83	---		"	"	"	"	GS-01
Percent Retained 0.85 mm sieve (#20)	19.70	---		"	"	"	"	GS-01
Percent Retained 0.425 mm sieve (#40)	12.31	---		"	"	"	"	GS-01
Percent Retained 0.250 mm sieve (#60)	4.75	---		"	"	"	"	GS-01
Percent Retained 0.150 mm sieve (#100)	2.18	---		"	"	"	"	GS-01
Percent Retained 0.106 mm sieve (#140)	0.94	---		"	"	"	"	GS-01
Percent Retained 0.075 mm sieve (#200)	0.84	---		"	"	"	"	GS-01
Percent Retained 0.063 mm sieve (#230)	0.39	---		"	"	"	"	GS-01
Silt (> 0.005 mm < 0.063 mm)	2.80	---		"	"	"	"	GS-01
Clay (< 0.005 mm)	0.20	---		"	"	"	"	GS-01

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 Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters - Dissolved

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-SW-JC-10-050113 (A3E0083-12) Matrix: Water								
Batch: 3050115								
Total Alkalinity	20.8	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	20.8	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-SW-JC-09-050113 (A3E0083-14) Matrix: Water								
Batch: 3050115								
Total Alkalinity	ND	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	ND	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-SW-JC-08-050113-DUP (A3E0083-16) Matrix: Water								
Batch: 3050115								
Total Alkalinity	ND	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	ND	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-SW-JC-08-050113 (A3E0083-17) Matrix: Water								
Batch: 3050115								
Total Alkalinity	20.0	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	20.0	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-SW-JC01-050213 (A3E0083-20) Matrix: Water								
Batch: 3050115								
Total Alkalinity	35.0	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	35.0	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-SW-EC06-050213 (A3E0083-22) Matrix: Water								
Batch: 3050115								
Total Alkalinity	40.0	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	40.0	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	

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Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters - Dissolved

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-DW-12620-050213 (A3E0083-24) Matrix: Water								
Batch: 3050115								
Total Alkalinity	255	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	255	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-DW-12620irrig-050213 (A3E0083-25) Matrix: Water								
Batch: 3050115								
Total Alkalinity	149	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	149	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-DW-541-050213 (A3E0083-26) Matrix: Water								
Batch: 3050115								
Total Alkalinity	281	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	281	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-DW-17607-050213 (A3E0083-27) Matrix: Water								
Batch: 3050115								
Total Alkalinity	215	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	215	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-DW-17607-050213DUP (A3E0083-28) Matrix: Water								
Batch: 3050115								
Total Alkalinity	214	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	214	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	
BL-DW-462-050213 (A3E0083-29) Matrix: Water								
Batch: 3050115								
Total Alkalinity	162	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	162	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	

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 Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Conventional Chemistry Parameters - Dissolved

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-SW-EC04-050213 (A3E0083-31)			Matrix: Water					
Batch: 3050115								
Total Alkalinity	39.3	---	20.0	mg CaCO3/L	1	05/06/13 10:50	SM 2320B (Diss)	
Bicarbonate Alkalinity	39.3	---	20.0	"	"	"	"	
Carbonate Alkalinity	ND	---	20.0	"	"	"	"	
Hydroxide Alkalinity	ND	---	20.0	"	"	"	"	

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Reported:
06/16/13 08:31

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
BL-TB-03-050113 (A3E0083-01)			Matrix: Soil		Batch: 3050138			
% Solids	35.7	---	1.00	% by Weight	1	05/07/13 12:59	Apex SOP	
BL-TB-2A,B-050113 (A3E0083-04)			Matrix: Soil		Batch: 3050200			
% Solids	83.0	---	1.00	% by Weight	1	05/08/13 10:45	Apex SOP	
BL-TB-1F,E,D,C,B,A-050113 (A3E0083-11)			Matrix: Soil		Batch: 3050189			
% Solids	63.2	---	1.00	% by Weight	1	05/08/13 09:19	Apex SOP	
BL-CS-JC-10-050113 (A3E0083-13)			Matrix: Soil		Batch: 3050138			
% Solids	54.7	---	1.00	% by Weight	1	05/07/13 12:59	Apex SOP	
BL-CS-JC-09-050113 (A3E0083-15)			Matrix: Soil		Batch: 3050138			
% Solids	73.2	---	1.00	% by Weight	1	05/07/13 12:59	Apex SOP	
BL-CS-JC-09-050113DUP (A3E0083-18)			Matrix: Soil		Batch: 3050138			
% Solids	80.5	---	1.00	% by Weight	1	05/07/13 12:59	Apex SOP	
BL-CS-JC01-050213 (A3E0083-21)			Matrix: Soil		Batch: 3050138			
% Solids	79.7	---	1.00	% by Weight	1	05/07/13 12:59	Apex SOP	
BL-CS-EC06-050213 (A3E0083-23)			Matrix: Soil		Batch: 3050138			
% Solids	78.1	---	1.00	% by Weight	1	05/07/13 12:59	Apex SOP	
BL-CS-EC04-050213 (A3E0083-30)			Matrix: Soil		Batch: 3050138			
% Solids	83.0	---	1.00	% by Weight	1	05/07/13 12:59	Apex SOP	
BL-CS-JC-08-050113 (A3E0083-32)			Matrix: Soil		Batch: 3050138			
% Solids	80.3	---	1.00	% by Weight	1	05/07/13 12:59	Apex SOP	

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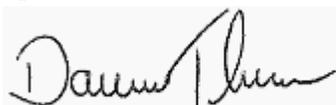
QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by EPA 300.0/9056A (Ion Chromatography)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050120 - Method Prep: Aq						Water						
Blank (3050120-BLK1)						Prepared: 05/06/13 08:30 Analyzed: 05/06/13 09:55						
EPA 300.0												
Sulfate	ND	---	1.00	mg/L	1	---	---	---	---	---	---	---
LCS (3050120-BS1)						Prepared: 05/06/13 08:30 Analyzed: 05/06/13 10:15						
EPA 300.0												
Sulfate	3.97	---	1.00	mg/L	1	4.00	---	99	90-110%	---	---	---
Duplicate (3050120-DUP1)						Prepared: 05/06/13 08:30 Analyzed: 05/06/13 10:56						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
EPA 300.0												
Sulfate	2.62	---	1.00	mg/L	1	---	2.64	---	---	0.6	15%	---
Duplicate (3050120-DUP2)						Prepared: 05/06/13 08:30 Analyzed: 05/06/13 15:01						
QC Source Sample: BL-DW-541-050213 (A3E0083-26)												
EPA 300.0												
Sulfate	21.2	---	1.00	mg/L	1	---	21.3	---	---	0.6	15%	---
Matrix Spike (3050120-MS1)						Prepared: 05/06/13 08:30 Analyzed: 05/06/13 11:16						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
EPA 300.0												
Sulfate	6.95	---	1.11	mg/L	1	4.44	2.64	97	80-120%	---	---	---
Matrix Spike (3050120-MS2)						Prepared: 05/06/13 08:30 Analyzed: 05/06/13 15:21						
QC Source Sample: BL-DW-541-050213 (A3E0083-26)												
EPA 300.0												
Sulfate	25.8	---	1.11	mg/L	1	4.44	21.3	102	80-120%	---	---	---

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Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

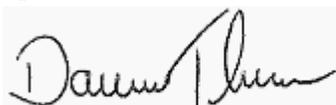
QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050160 - EPA 3051A						Soil						
Blank (3050160-BLK1)						Prepared: 05/07/13 09:08 Analyzed: 05/08/13 10:34						
EPA 6020A												
Arsenic	ND	0.250	0.500	mg/kg wet	5	---	---	---	---	---	---	
Cadmium	ND	0.0500	0.100	"	"	---	---	---	---	---	---	
Copper	ND	0.500	1.00	"	"	---	---	---	---	---	---	U
Iron	ND	---	25.0	"	"	---	---	---	---	---	---	
Lead	ND	0.250	0.500	"	"	---	---	---	---	---	---	U
Zinc	ND	1.00	2.00	"	"	---	---	---	---	---	---	U
LCS (3050160-BS1)						Prepared: 05/07/13 09:08 Analyzed: 05/08/13 10:40						
EPA 6020A												
Arsenic	24.4	0.250	0.500	mg/kg wet	5	25.0	---	98	80-120%	---	---	
Cadmium	23.9	0.0500	0.100	"	"	"	---	96	"	---	---	
Copper	25.4	0.500	1.00	"	"	"	---	102	"	---	---	
Iron	2480	---	25.0	"	"	2500	---	99	"	---	---	
Lead	24.1	0.250	0.500	"	"	25.0	---	96	"	---	---	
Zinc	24.8	1.00	2.00	"	"	"	---	99	"	---	---	
Duplicate (3050160-DUP1)						Prepared: 05/07/13 09:08 Analyzed: 05/08/13 11:03						
QC Source Sample: BL-CS-JC-10-050113 (A3E0083-13)												
EPA 6020A												
Arsenic	2.71	0.507	1.01	mg/kg dry	5	---	2.56	---	---	6	40%	
Cadmium	0.294	0.101	0.203	"	"	---	0.235	---	---	22	40%	
Copper	76.7	1.01	2.03	"	"	---	50.5	---	---	41	40%	Q-04
Iron	19700	---	50.7	"	"	---	15600	---	---	23	40%	
Lead	2.28	0.507	1.01	"	"	---	2.66	---	---	15	40%	
Zinc	44.9	2.03	4.05	"	"	---	36.3	---	---	21	40%	
Matrix Spike (3050160-MS1)						Prepared: 05/07/13 09:08 Analyzed: 05/08/13 11:06						
QC Source Sample: BL-CS-JC-10-050113 (A3E0083-13)												
EPA 6020A												
Arsenic	47.1	0.448	0.896	mg/kg dry	5	44.8	2.56	99	75-125%	---	---	
Cadmium	46.4	0.0896	0.179	"	"	"	0.235	103	"	---	---	
Copper	138	0.896	1.79	"	"	"	50.5	194	"	---	---	Q-04
Iron	23600	---	44.8	"	"	4480	15600	179	"	---	---	Q-04
Lead	47.9	0.448	0.896	"	"	44.8	2.66	101	"	---	---	
Zinc	86.0	1.79	3.58	"	"	"	36.3	111	"	---	---	

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Reported:
 06/16/13 08:31

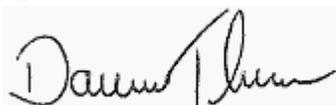
QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050160 - EPA 3051A						Soil						
Matrix Spike (3050160-MS2)						Prepared: 05/07/13 09:08 Analyzed: 05/08/13 13:10						
QC Source Sample: Other (A3E0101-18)												
EPA 6020A												
Arsenic	29.7	0.291	0.582	mg/kg dry	5	29.1	3.06	92	75-125%	---	---	
Cadmium	29.2	0.0582	0.116	"	"	"	0.707	98	"	---	---	
Copper	75.4	0.582	1.16	"	"	"	45.5	103	"	---	---	
Lead	64.1	0.291	0.582	"	"	"	45.9	63	"	---	---	Q-01
Zinc	87.0	1.16	2.33	"	"	"	62.5	84	"	---	---	
Post Spike (3050160-PS1)						Prepared: 05/08/13 12:42 Analyzed: 05/08/13 13:13						
QC Source Sample: BL-CS-JC-10-050113 (A3E0083-13)												
EPA 6020A												
Copper	746			ug/L	5	455	254	108	80-120%		---	
Iron	124000	---		"	"	45500	78600	101	"		---	
Post Spike (3050160-PS2)						Prepared: 05/10/13 08:47 Analyzed: 05/10/13 11:20						
QC Source Sample: Post Spike (A3E0101-18)												
EPA 6020A												
Lead	850			ug/L	5	476	386	97	80-120%		---	

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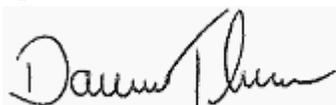
QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050237 - EPA 3051A												
Soil												
Blank (3050237-BLK1) Prepared: 05/09/13 09:04 Analyzed: 05/10/13 11:23												
EPA 6020A												
Arsenic	ND	0.250	0.500	mg/kg wet	5	---	---	---	---	---	---	
Cadmium	ND	0.0500	0.100	"	"	---	---	---	---	---	---	
Copper	ND	0.500	1.00	"	"	---	---	---	---	---	---	U
Iron	ND	---	25.0	"	"	---	---	---	---	---	---	
Lead	ND	0.250	0.500	"	"	---	---	---	---	---	---	U
Zinc	ND	1.00	2.00	"	"	---	---	---	---	---	---	U
LCS (3050237-BS1) Prepared: 05/09/13 09:04 Analyzed: 05/10/13 11:26												
EPA 6020A												
Arsenic	25.2	0.250	0.500	mg/kg wet	5	25.0	---	101	80-120%	---	---	
Cadmium	25.6	0.0500	0.100	"	"	"	---	102	"	---	---	
Copper	24.8	0.500	1.00	"	"	"	---	99	"	---	---	
Iron	2590	---	25.0	"	"	2500	---	104	"	---	---	
Lead	25.7	0.250	0.500	"	"	25.0	---	103	"	---	---	
Zinc	26.0	1.00	2.00	"	"	"	---	104	"	---	---	
Duplicate (3050237-DUP1) Prepared: 05/09/13 09:04 Analyzed: 05/10/13 11:35												
QC Source Sample: BL-CS-JC01-050213 (A3E0083-21RE1)												
EPA 6020A												
Arsenic	7.23	0.307	0.614	mg/kg dry	5	---	4.37	---	---	49	40%	Q-17
Cadmium	1.96	0.0614	0.123	"	"	---	2.40	---	---	20	40%	
Copper	573	0.614	1.23	"	"	---	585	---	---	2	40%	
Iron	15700	---	30.7	"	"	---	17000	---	---	8	40%	
Lead	15.0	0.307	0.614	"	"	---	16.3	---	---	9	40%	
Zinc	442	1.23	2.46	"	"	---	602	---	---	31	40%	
Matrix Spike (3050237-MS1) Prepared: 05/09/13 09:04 Analyzed: 05/10/13 11:38												
QC Source Sample: BL-CS-JC01-050213 (A3E0083-21RE1)												
EPA 6020A												
Arsenic	37.0	0.303	0.606	mg/kg dry	5	30.3	4.37	108	75-125%	---	---	
Cadmium	32.5	0.0606	0.121	"	"	"	2.40	99	"	---	---	
Copper	496	0.606	1.21	"	"	"	585	-294	"	---	---	Q-03
Iron	17100	---	30.3	"	"	3030	17000	3	"	---	---	Q-03
Lead	43.6	0.303	0.606	"	"	30.3	16.3	90	"	---	---	
Zinc	437	1.21	2.42	"	"	"	602	-548	"	---	---	Q-03

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4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

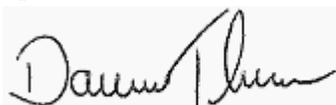
QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050237 - EPA 3051A												
Soil												
Matrix Spike (3050237-MS2)						Prepared: 05/09/13 09:04 Analyzed: 05/10/13 14:13						
QC Source Sample: Other (A3E0160-12)												
EPA 6020A												
Arsenic	50.0	0.343	0.687	mg/kg dry	5	34.3	16.7	97	75-125%	---	---	
Cadmium	44.2	0.0687	0.137	"	"	"	11.7	95	"	---	---	
Copper	481	0.687	1.37	"	"	"	462	54	"	---	---	Q-03
Iron	28300	---	34.3	"	"	3430	24800	101	"	---	---	
Lead	998	0.343	0.687	"	"	34.3	1050	-142	"	---	---	Q-03
Zinc	705	1.37	2.75	"	"	"	704	3	"	---	---	Q-03
Matrix Spike Dup (3050237-MSD1)						Prepared: 05/09/13 09:04 Analyzed: 05/10/13 11:41						
QC Source Sample: BL-CS-JC01-050213 (A3E0083-21RE1)												
EPA 6020A												
Arsenic	36.2	0.327	0.653	mg/kg dry	5	32.7	4.37	97	75-125%	2	40%	
Cadmium	34.3	0.0653	0.131	"	"	"	2.40	98	"	6	40%	
Copper	501	0.653	1.31	"	"	"	585	-256	"	1	40%	Q-03
Iron	17900	---	32.7	"	"	3270	17000	30	"	5	40%	Q-03
Lead	49.4	0.327	0.653	"	"	32.7	16.3	101	"	13	40%	
Zinc	409	1.31	2.61	"	"	"	602	-593	"	7	40%	Q-03
Post Spike (3050237-PS1)						Prepared: 05/10/13 14:11 Analyzed: 05/10/13 14:48						
QC Source Sample: BL-CS-JC01-050213 (A3E0083-21RE1)												
EPA 6020A												
Copper	4670			ug/L	5	1540	3280	90	80-120%		---	
Iron	171000	---		"	"	76900	95100	99	"		---	
Zinc	4840			"	"	1540	3380	95	"		---	
Post Spike (3050237-PS2)						Prepared: 05/10/13 14:47 Analyzed: 05/10/13 14:51						
QC Source Sample: Post Spike (A3E0160-12)												
EPA 6020A												
Copper	5540			ug/L	5	3330	2070	104	80-120%		---	
Lead	8020			"	"	"	4690	100	"		---	
Zinc	6520			"	"	"	3150	101	"		---	

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Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

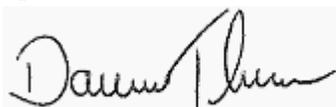
QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050324 - EPA 3015A												
Water												
Blank (3050324-BLK1)												
						Prepared: 05/13/13 15:30 Analyzed: 05/14/13 19:26						
EPA 6020A												
Antimony	ND	0.500	1.00	ug/L	1	---	---	---	---	---	---	U
Arsenic	ND	---	2.00	"	"	---	---	---	---	---	---	
Barium	ND	0.500	1.00	"	"	---	---	---	---	---	---	U
Beryllium	ND	0.500	1.00	"	"	---	---	---	---	---	---	U
Chromium	ND	0.500	2.00	"	"	---	---	---	---	---	---	U
Cobalt	ND	0.500	1.00	"	"	---	---	---	---	---	---	U
Copper	ND	---	2.00	"	"	---	---	---	---	---	---	
Lead	ND	---	1.00	"	"	---	---	---	---	---	---	
Molybdenum	ND	1.00	2.00	"	"	---	---	---	---	---	---	U
Nickel	ND	0.500	2.00	"	"	---	---	---	---	---	---	U
Selenium	ND	1.00	2.00	"	"	---	---	---	---	---	---	U
Silver	ND	0.500	1.00	"	"	---	---	---	---	---	---	U
Thallium	ND	0.500	1.00	"	"	---	---	---	---	---	---	U
Vanadium	ND	1.00	2.00	"	"	---	---	---	---	---	---	U
Zinc	ND	---	4.00	"	"	---	---	---	---	---	---	
Blank (3050324-BLK2)												
						Prepared: 05/13/13 15:30 Analyzed: 05/15/13 12:28						
EPA 6020A												
Cadmium	ND	---	0.200	ug/L	1	---	---	---	---	---	---	Q-16
Mercury	ND	0.0400	0.0800	"	"	---	---	---	---	---	---	Q-16, U
LCS (3050324-BS1)												
						Prepared: 05/13/13 15:30 Analyzed: 05/14/13 19:29						
EPA 6020A												
Antimony	26.9	0.500	1.00	ug/L	1	27.8	---	97	80-120%	---	---	
Arsenic	54.1	---	2.00	"	"	55.6	---	97	85-115%	---	---	
Barium	54.7	0.500	1.00	"	"	"	---	98	80-120%	---	---	
Beryllium	26.9	0.500	1.00	"	"	27.8	---	97	"	---	---	
Chromium	55.0	0.500	2.00	"	"	55.6	---	99	"	---	---	
Cobalt	54.8	0.500	1.00	"	"	"	---	99	"	---	---	
Copper	54.5	---	2.00	"	"	"	---	98	"	---	---	
Lead	55.4	---	1.00	"	"	"	---	100	"	---	---	
Molybdenum	27.5	1.00	2.00	"	"	27.8	---	99	"	---	---	
Nickel	54.7	0.500	2.00	"	"	55.6	---	98	"	---	---	
Selenium	26.6	1.00	2.00	"	"	27.8	---	96	"	---	---	
Silver	27.5	0.500	1.00	"	"	"	---	99	"	---	---	

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Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

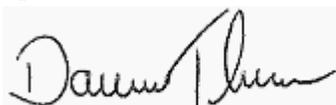
QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050324 - EPA 3015A												
Water												
LCS (3050324-BS1)												
						Prepared: 05/13/13 15:30	Analyzed: 05/14/13 19:29					
Thallium	27.2	0.500	1.00	ug/L	"	"	---	98	"	---	---	
Vanadium	54.7	1.00	2.00	"	"	55.6	---	98	"	---	---	
Zinc	53.1	---	4.00	"	"	"	---	96	"	---	---	
LCS (3050324-BS2)												
						Prepared: 05/13/13 15:30	Analyzed: 05/15/13 12:31					
EPA 6020A												
Cadmium	54.9	---	0.200	ug/L	1	55.6	---	99	80-120%	---	---	Q-16
Mercury	1.12	0.0400	0.0800	"	"	1.11	---	101	"	---	---	Q-16
Duplicate (3050324-DUP1)												
						Prepared: 05/13/13 15:30	Analyzed: 05/14/13 19:35					
QC Source Sample: Other (A3E0131-02)												
EPA 6020A												
Antimony	ND	0.500	1.00	ug/L	1	---	ND	---	---	---	20%	U
Arsenic	11.4	---	2.00	"	"	---	11.5	---	---	1	20%	
Barium	151	0.500	1.00	"	"	---	149	---	---	1	20%	
Beryllium	ND	0.500	1.00	"	"	---	ND	---	---	---	20%	U
Chromium	ND	0.500	2.00	"	"	---	ND	---	---	---	20%	U
Cobalt	1.41	0.500	1.00	"	"	---	1.46	---	---	3	20%	
Copper	ND	---	2.00	"	"	---	ND	---	---	---	20%	
Lead	ND	---	1.00	"	"	---	ND	---	---	---	20%	
Molybdenum	ND	1.00	2.00	"	"	---	ND	---	---	---	20%	U
Nickel	1.24	0.500	2.00	"	"	---	1.23	---	---	0.9	20%	J
Selenium	ND	1.00	2.00	"	"	---	ND	---	---	---	20%	U
Silver	ND	0.500	1.00	"	"	---	ND	---	---	---	20%	U
Thallium	ND	0.500	1.00	"	"	---	ND	---	---	---	20%	U
Vanadium	ND	1.00	2.00	"	"	---	ND	---	---	---	20%	U
Zinc	ND	---	4.00	"	"	---	2.41	---	---	***	20%	
Duplicate (3050324-DUP2)												
						Prepared: 05/13/13 15:30	Analyzed: 05/15/13 12:44					
QC Source Sample: Other (A3E0131-02)												
EPA 6020A												
Cadmium	ND	---	0.200	ug/L	1	---	ND	---	---	---	20%	Q-16
Mercury	ND	0.0400	0.0800	"	"	---	ND	---	---	---	20%	Q-16, U
Matrix Spike (3050324-MS1)												
						Prepared: 05/13/13 15:30	Analyzed: 05/14/13 19:38					
QC Source Sample: Other (A3E0131-02)												

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Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050324 - EPA 3015A												
Water												
Matrix Spike (3050324-MS1)						Prepared: 05/13/13 15:30 Analyzed: 05/14/13 19:38						
QC Source Sample: Other (A3E0131-02)												
EPA 6020A												
Antimony	28.0	0.500	1.00	ug/L	1	27.8	ND	101	75-125%	---	---	
Arsenic	68.2	---	2.00	"	"	55.6	11.5	102	70-130%	---	---	
Barium	211	0.500	1.00	"	"	"	149	113	75-125%	---	---	
Beryllium	27.8	0.500	1.00	"	"	27.8	ND	100	"	---	---	
Chromium	57.1	0.500	2.00	"	"	55.6	ND	103	"	---	---	
Cobalt	57.9	0.500	1.00	"	"	"	1.46	102	"	---	---	
Copper	54.8	---	2.00	"	"	"	ND	99	"	---	---	
Lead	55.9	---	1.00	"	"	"	ND	101	"	---	---	
Molybdenum	30.3	1.00	2.00	"	"	27.8	ND	109	"	---	---	
Nickel	55.5	0.500	2.00	"	"	55.6	1.23	98	"	---	---	
Selenium	28.0	1.00	2.00	"	"	27.8	ND	101	"	---	---	
Silver	27.9	0.500	1.00	"	"	"	ND	100	"	---	---	
Thallium	27.7	0.500	1.00	"	"	"	ND	100	"	---	---	
Vanadium	57.8	1.00	2.00	"	"	55.6	ND	104	"	---	---	
Zinc	55.6	---	4.00	"	"	"	2.41	96	"	---	---	

Matrix Spike (3050324-MS2)

Prepared: 05/13/13 15:30 Analyzed: 05/14/13 19:44

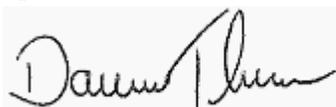
QC Source Sample: Other (A3E0193-01)

EPA 6020A

Antimony	28.1	2.50	5.00	ug/L	5	27.8	ND	101	75-125%	---	---	
Arsenic	67.2	---	10.0	"	"	55.6	7.20	108	70-130%	---	---	
Barium	58.3	2.50	5.00	"	"	"	0.911	103	75-125%	---	---	
Beryllium	28.5	2.50	5.00	"	"	27.8	ND	103	"	---	---	
Chromium	59.9	2.50	10.0	"	"	55.6	ND	108	"	---	---	
Cobalt	59.5	2.50	5.00	"	"	"	ND	107	"	---	---	
Copper	68.6	---	10.0	"	"	"	7.71	110	"	---	---	
Lead	59.8	---	5.00	"	"	"	ND	108	"	---	---	
Molybdenum	29.9	5.00	10.0	"	"	27.8	1.38	103	"	---	---	
Nickel	57.9	2.50	10.0	"	"	55.6	0.600	103	"	---	---	
Selenium	35.4	5.00	10.0	"	"	27.8	2.43	119	"	---	---	
Silver	29.2	2.50	5.00	"	"	"	ND	105	"	---	---	
Thallium	29.4	2.50	5.00	"	"	"	ND	106	"	---	---	
Vanadium	59.7	5.00	10.0	"	"	55.6	ND	108	"	---	---	

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 4585 Pacheco Blvd, Suite 200 (Corporate address)
 Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050324 - EPA 3015A						Water						
Matrix Spike (3050324-MS2)						Prepared: 05/13/13 15:30 Analyzed: 05/14/13 19:44						
QC Source Sample: Other (A3E0193-01)												
Zinc	206	---	20.0	ug/L	"	"	127	142	"	---	---	Q-01
Matrix Spike (3050324-MS3)						Prepared: 05/13/13 15:30 Analyzed: 05/15/13 12:47						
QC Source Sample: Other (A3E0131-02)												
EPA 6020A												
Cadmium	55.9	---	0.200	ug/L	1	55.6	ND	101	75-125%	---	---	Q-16
Mercury	1.12	0.0400	0.0800	"	"	1.11	ND	101	"	---	---	Q-16
Matrix Spike (3050324-MS4)						Prepared: 05/13/13 15:30 Analyzed: 05/15/13 13:04						
QC Source Sample: Other (A3E0193-01)												
EPA 6020A												
Cadmium	55.3	---	0.200	ug/L	1	55.6	ND	100	75-125%	---	---	Q-16
Mercury	1.12	0.0400	0.0800	"	"	1.11	ND	101	"	---	---	Q-16
Post Spike (3050324-PS2)						Prepared: 05/16/13 09:42 Analyzed: 05/16/13 09:56						
QC Source Sample: Post Spike (A3E0193-01)												
EPA 6020A												
Zinc	366	---		ug/L	5	244	111	105	80-120%		---	

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Project: **Blue Ledge Mine 2013**
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Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

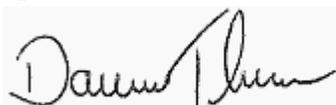
QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050173 - Matrix Matched Direct Inject						Water						
Blank (3050173-BLK1)						Prepared: 05/07/13 11:46 Analyzed: 05/08/13 13:16						
EPA 6020A (Diss)												
Cadmium	ND	0.0400	0.200	ug/L	1	---	---	---	---	---	---	FILT3
Copper	ND	1.00	2.00	"	"	---	---	---	---	---	---	FILT3, U
Iron	ND	25.0	50.0	"	"	---	---	---	---	---	---	FILT3, U
Lead	ND	0.500	1.00	"	"	---	---	---	---	---	---	FILT3, U
Zinc	ND	2.00	4.00	"	"	---	---	---	---	---	---	FILT3, U
Blank (3050173-BLK2)						Prepared: 05/07/13 11:46 Analyzed: 05/09/13 15:13						
EPA 6020A (Diss)												
Calcium	ND	50.0	100	ug/L	1	---	---	---	---	---	---	FILT3, Q-16, U
Magnesium	ND	25.0	50.0	"	"	---	---	---	---	---	---	FILT3, Q-16, U
Blank (3050173-BLK3)						Prepared: 05/07/13 11:46 Analyzed: 05/13/13 12:08						
EPA 6020A (Diss)												
Arsenic	ND	0.250	0.500	ug/L	1	---	---	---	---	---	---	
LCS (3050173-BS1)						Prepared: 05/07/13 11:46 Analyzed: 05/08/13 13:19						
EPA 6020A (Diss)												
Cadmium	54.5	0.0400	0.200	ug/L	1	55.6	---	98	80-120%	---	---	
Copper	56.2	1.00	2.00	"	"	"	---	101	"	---	---	
Iron	5610	25.0	50.0	"	"	5560	---	101	"	---	---	
Lead	56.3	0.500	1.00	"	"	55.6	---	101	"	---	---	
Zinc	55.6	2.00	4.00	"	"	"	---	100	"	---	---	
LCS (3050173-BS2)						Prepared: 05/07/13 11:46 Analyzed: 05/09/13 15:16						
EPA 6020A (Diss)												
Calcium	5550	50.0	100	ug/L	1	5560	---	100	80-120%	---	---	Q-16
Magnesium	5800	25.0	50.0	"	"	"	---	104	"	---	---	Q-16
LCS (3050173-BS3)						Prepared: 05/07/13 11:46 Analyzed: 05/13/13 12:11						
EPA 6020A (Diss)												
Arsenic	54.1	0.250	0.500	ug/L	1	55.6	---	97	85-115%	---	---	
Matrix Spike (3050173-MS1)						Prepared: 05/07/13 11:46 Analyzed: 05/08/13 13:29						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
EPA 6020A (Diss)												
Cadmium	54.6	0.0400	0.200	ug/L	1	55.6	ND	98	75-125%	---	---	

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Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

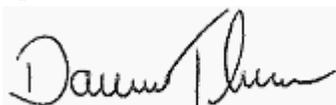
QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050173 - Matrix Matched Direct Inject						Water						
Matrix Spike (3050173-MS1)						Prepared: 05/07/13 11:46 Analyzed: 05/08/13 13:29						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
Copper	56.4	1.00	2.00	ug/L	"	"	ND	102	"	---	---	
Iron	5790	25.0	50.0	"	"	5560	225	100	"	---	---	
Lead	56.4	0.500	1.00	"	"	55.6	ND	102	"	---	---	
Zinc	53.6	2.00	4.00	"	"	"	ND	96	"	---	---	
Matrix Spike (3050173-MS2)						Prepared: 05/07/13 11:46 Analyzed: 05/09/13 17:12						
QC Source Sample: BL-DW-541-050213 (A3E0083-26)												
EPA 6020A (Diss)												
Cadmium	57.4	0.200	1.00	ug/L	5	55.6	0.133	103	75-125%	---	---	
Calcium	79900	250	500	"	"	5560	74400	98	"	---	---	
Copper	62.2	5.00	10.0	"	"	55.6	6.76	100	"	---	---	
Iron	7270	125	250	"	"	5560	1760	99	"	---	---	
Lead	56.5	2.50	5.00	"	"	55.6	0.522	101	"	---	---	
Magnesium	23100	125	250	"	"	5560	17200	107	"	---	---	
Zinc	276	10.0	20.0	"	"	55.6	210	120	"	---	---	
Matrix Spike (3050173-MS3)						Prepared: 05/07/13 11:46 Analyzed: 05/09/13 16:12						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
EPA 6020A (Diss)												
Calcium	13100	50.0	100	ug/L	1	5560	7390	103	75-125%	---	---	Q-16
Magnesium	7160	25.0	50.0	"	"	"	1210	107	"	---	---	Q-16
Matrix Spike (3050173-MS4)						Prepared: 05/07/13 11:46 Analyzed: 05/13/13 12:17						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
EPA 6020A (Diss)												
Arsenic	56.1	0.250	0.500	ug/L	1	55.6	ND	101	70-130%	---	---	
Matrix Spike (3050173-MS5)						Prepared: 05/07/13 11:46 Analyzed: 05/13/13 12:58						
QC Source Sample: BL-DW-541-050213 (A3E0083-26)												
EPA 6020A (Diss)												
Arsenic	61.1	0.250	0.500	ug/L	1	55.6	5.96	99	70-130%	---	---	
Matrix Spike Dup (3050173-MSD1)						Prepared: 05/07/13 11:46 Analyzed: 05/08/13 13:38						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												

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Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
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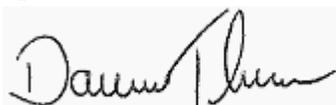
QUALITY CONTROL (QC) SAMPLE RESULTS

Dissolved Metals by EPA 6020 (ICPMS)

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050173 - Matrix Matched Direct Inject						Water						
Matrix Spike Dup (3050173-MSD1)						Prepared: 05/07/13 11:46 Analyzed: 05/08/13 13:38						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
EPA 6020A (Diss)												
Cadmium	55.6	0.0400	0.200	ug/L	1	55.6	ND	100	75-125%	2	20%	
Copper	57.0	1.00	2.00	"	"	"	ND	103	"	1	20%	
Iron	5860	25.0	50.0	"	"	5560	225	101	"	1	20%	
Lead	56.9	0.500	1.00	"	"	55.6	ND	102	"	0.8	20%	
Zinc	55.7	2.00	4.00	"	"	"	ND	100	"	4	20%	
Matrix Spike Dup (3050173-MSD2)						Prepared: 05/07/13 11:46 Analyzed: 05/09/13 17:15						
QC Source Sample: BL-DW-541-050213 (A3E0083-26)												
EPA 6020A (Diss)												
Cadmium	58.3	0.200	1.00	ug/L	5	55.6	0.133	105	75-125%	2	20%	
Calcium	80000	250	500	"	"	5560	74400	100	"	0.1	20%	
Copper	61.2	5.00	10.0	"	"	55.6	6.76	98	"	2	20%	
Iron	7240	125	250	"	"	5560	1760	99	"	0.5	20%	
Lead	56.3	2.50	5.00	"	"	55.6	0.522	100	"	0.4	20%	
Magnesium	23100	125	250	"	"	5560	17200	106	"	0.3	20%	
Zinc	274	10.0	20.0	"	"	55.6	210	115	"	0.9	20%	
Matrix Spike Dup (3050173-MSD3)						Prepared: 05/07/13 11:46 Analyzed: 05/09/13 16:19						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
EPA 6020A (Diss)												
Calcium	13300	50.0	100	ug/L	1	5560	7390	106	75-125%	1	20%	Q-16
Magnesium	7250	25.0	50.0	"	"	"	1210	109	"	1	20%	Q-16
Matrix Spike Dup (3050173-MSD4)						Prepared: 05/07/13 11:46 Analyzed: 05/13/13 12:19						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
EPA 6020A (Diss)												
Arsenic	55.4	0.250	0.500	ug/L	1	55.6	ND	100	70-130%	1	20%	
Matrix Spike Dup (3050173-MSD5)						Prepared: 05/07/13 11:46 Analyzed: 05/13/13 13:01						
QC Source Sample: BL-DW-541-050213 (A3E0083-26)												
EPA 6020A (Diss)												
Arsenic	61.9	0.250	0.500	ug/L	1	55.6	5.96	101	70-130%	1	20%	

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 Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

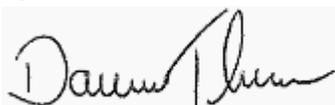
Reported:
 06/16/13 08:31

QUALITY CONTROL (QC) SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050100 - Method Prep: Aq						Water						
Duplicate (3050100-DUP1)						Prepared: 05/03/13 15:31 Analyzed: 05/03/13 15:48						
QC Source Sample: BL-RS-050113 (A3E0083-19)												
EPA 150.1												
pH	3.26	---		pH Units	1	---	3.26	---	---	0	10%	
pH Temperature (deg C)	22.8	---		"	"	---	23.1	---	---	1	30%	
Reference (3050100-SRM1)						Prepared: 05/03/13 15:31 Analyzed: 05/03/13 15:46						
EPA 150.1												
pH	6.04	---		pH Units	1	6.00		101	98.4-101.7%	---	---	
Reference (3050100-SRM2)						Prepared: 05/03/13 15:31 Analyzed: 05/03/13 15:49						
EPA 150.1												
pH	1.93	---		pH Units	1	2.00		96	95-105%	---	---	

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 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

QUALITY CONTROL (QC) SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050122 - Total Suspended Solids						Water						
Blank (3050122-BLK1)						Prepared: 05/06/13 15:50 Analyzed: 05/08/13 15:04						
SM 2540 C												
Total Dissolved Solids	ND	---	10.0	mg/L	1	---	---	---	---	---	---	---
Duplicate (3050122-DUP1)						Prepared: 05/06/13 15:50 Analyzed: 05/08/13 15:04						
QC Source Sample: Other (A3E0083-16)												
SM 2540 C												
Total Dissolved Solids	24.0	---	10.0	mg/L	1	---	21.0	---	---	13	20%	
Duplicate (3050122-DUP2)						Prepared: 05/06/13 15:50 Analyzed: 05/08/13 15:04						
QC Source Sample: BL-DW-12620irrig-050213 (A3E0083-25)												
SM 2540 C												
Total Dissolved Solids	214	---	10.0	mg/L	1	---	211	---	---	1	20%	
Reference (3050122-SRM1)						Prepared: 05/06/13 15:50 Analyzed: 05/09/13 09:09						
SM 2540 C												
Total Dissolved Solids	1010	---		mg/L	1	1000		101	90-110%	---	---	

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 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

QUALITY CONTROL (QC) SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050123 - Total Suspended Solids						Water						
Blank (3050123-BLK1)						Prepared: 05/06/13 15:50 Analyzed: 05/07/13 12:00						
SM 2540 D												
Total Suspended Solids	ND	---	2.00	mg/L	1	---	---	---	---	---	---	---
Duplicate (3050123-DUP1)						Prepared: 05/06/13 15:50 Analyzed: 05/07/13 12:00						
QC Source Sample: Other (A3E0083-16)												
SM 2540 D												
Total Suspended Solids	6.00	---	5.00	mg/L	1	---	ND	---	---	---	20%	---
Duplicate (3050123-DUP2)						Prepared: 05/06/13 15:50 Analyzed: 05/07/13 12:00						
QC Source Sample: BL-DW-12620irrig-050213 (A3E0083-25)												
SM 2540 D												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	ND	---	---	---	20%	---
Reference (3050123-SRM1)						Prepared: 05/06/13 15:50 Analyzed: 05/07/13 12:00						
SM 2540 D												
Total Suspended Solids	93.0	---		mg/L	1	100		93	90-110%	---	---	---

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Reported:
 06/16/13 08:31

QUALITY CONTROL (QC) SAMPLE RESULTS

Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050170 - Method Prep: Non-Aq						Soil						
Duplicate (3050170-DUP1)						Prepared: 05/07/13 10:48 Analyzed: 05/07/13 13:47						
QC Source Sample: BL-TB-03-050113 (A3E0083-01)												
EPA 9045D												
Soil pH (measured in H2O)	6.50	---		pH Units	1	---	6.52	---	---	0.3	10%	
pH Temperature (deg C)	23.8	---		"	"	---	24.2	---	---	2	30%	
Reference (3050170-SRM1)						Prepared: 05/07/13 10:48 Analyzed: 05/07/13 11:41						
EPA 9045D												
Soil pH (measured in H2O)	6.04	---		pH Units	1	6.00		101	98.4-101.7%	---	---	
Reference (3050170-SRM2)						Prepared: 05/07/13 10:48 Analyzed: 05/07/13 11:43						
EPA 9045D												
Soil pH (measured in H2O)	7.96	---		pH Units	1	8.00		100	98.4-101.7%	---	---	
Reference (3050170-SRM3)						Prepared: 05/07/13 10:48 Analyzed: 05/07/13 13:44						
EPA 9045D												
Soil pH (measured in H2O)	6.03	---		pH Units	1	6.00		100	98.4-101.7%	---	---	
Reference (3050170-SRM4)						Prepared: 05/07/13 10:48 Analyzed: 05/07/13 13:52						
EPA 9045D												
Soil pH (measured in H2O)	7.95	---		pH Units	1	8.00		99	98.4-101.7%	---	---	

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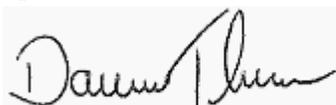
QUALITY CONTROL (QC) SAMPLE RESULTS

Conventional Chemistry Parameters - Dissolved

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050115 - Method Prep: Aq						Water						
Blank (3050115-BLK1)						Prepared: 05/06/13 07:28 Analyzed: 05/06/13 10:50						
SM 2320B (Diss)												
Total Alkalinity	ND	---	20.0	mg CaCO3/L	1	---	---	---	---	---	---	---
Bicarbonate Alkalinity	ND	---	20.0	"	"	---	---	---	---	---	---	---
Carbonate Alkalinity	ND	---	20.0	"	"	---	---	---	---	---	---	---
Hydroxide Alkalinity	ND	---	20.0	"	"	---	---	---	---	---	---	---
LCS (3050115-BS1)						Prepared: 05/06/13 07:28 Analyzed: 05/06/13 10:50						
SM 2320B (Diss)												
Total Alkalinity	189	---	20.0	mg CaCO3/L	1	191	---	99	85-115%	---	---	---
Bicarbonate Alkalinity	ND	---	20.0	"	"	"	---		0-200%	---	---	---
Carbonate Alkalinity	178	---	20.0	"	"	"	---	93	"	---	---	---
Hydroxide Alkalinity	ND	---	20.0	"	"	0.000100	---		"	---	---	---
Duplicate (3050115-DUP1)						Prepared: 05/06/13 07:28 Analyzed: 05/06/13 10:50						
QC Source Sample: BL-SW-JC-10-050113 (A3E0083-12)												
SM 2320B (Diss)												
Total Alkalinity	ND	---	20.0	mg CaCO3/L	1	---	20.8	---	---	---	20%	***
Bicarbonate Alkalinity	ND	---	20.0	"	"	---	20.8	---	---	---	20%	***
Carbonate Alkalinity	ND	---	20.0	"	"	---	ND	---	---	---	20%	---
Hydroxide Alkalinity	ND	---	20.0	"	"	---	ND	---	---	---	20%	---
Duplicate (3050115-DUP2)						Prepared: 05/06/13 07:28 Analyzed: 05/06/13 10:50						
QC Source Sample: BL-DW-541-050213 (A3E0083-26)												
SM 2320B (Diss)												
Total Alkalinity	233	---	20.0	mg CaCO3/L	1	---	281	---	---	---	20%	---
Bicarbonate Alkalinity	233	---	20.0	"	"	---	281	---	---	---	20%	---
Carbonate Alkalinity	ND	---	20.0	"	"	---	ND	---	---	---	20%	---
Hydroxide Alkalinity	ND	---	20.0	"	"	---	ND	---	---	---	20%	---

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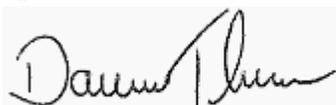
QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050138 - Total Solids (Dry Weight)						Soil						
Duplicate (3050138-DUP1)						Prepared: 05/06/13 12:39 Analyzed: 05/07/13 12:59						
QC Source Sample: Other (A3E0111-02)												
Apex SOP												
% Solids	83.2	---	1.00	% by Weight	1	---	79.4	---	---	5	20%	
Duplicate (3050138-DUP2)						Prepared: 05/06/13 16:36 Analyzed: 05/07/13 12:59						
QC Source Sample: BL-CS-JC-08-050113 (A3E0083-32)												
Apex SOP												
% Solids	81.6	---	1.00	% by Weight	1	---	80.3	---	---	2	20%	
Duplicate (3050138-DUP3)						Prepared: 05/06/13 16:36 Analyzed: 05/07/13 12:59						
QC Source Sample: Other (A3E0101-18)												
Apex SOP												
% Solids	85.3	---	1.00	% by Weight	1	---	85.3	---	---	0	20%	
Duplicate (3050138-DUP4)						Prepared: 05/06/13 16:36 Analyzed: 05/07/13 12:59						
QC Source Sample: Other (A3E0103-10)												
Apex SOP												
% Solids	89.5	---	1.00	% by Weight	1	---	88.5	---	---	1	20%	
Duplicate (3050138-DUP5)						Prepared: 05/06/13 16:36 Analyzed: 05/07/13 12:59						
QC Source Sample: Other (A3E0103-30)												
Apex SOP												
% Solids	81.3	---	1.00	% by Weight	1	---	83.9	---	---	3	20%	
Duplicate (3050138-DUP6)						Prepared: 05/06/13 18:24 Analyzed: 05/07/13 12:59						
QC Source Sample: Other (A3E0129-02)												
Apex SOP												
% Solids	79.1	---	1.00	% by Weight	1	---	78.8	---	---	0.4	20%	
Duplicate (3050138-DUP7)						Prepared: 05/06/13 18:58 Analyzed: 05/07/13 12:59						
QC Source Sample: Other (A3E0135-01)												
Apex SOP												
% Solids	88.8	---	1.00	% by Weight	1	---	88.9	---	---	0.1	20%	
Duplicate (3050138-DUP8)						Prepared: 05/06/13 19:27 Analyzed: 05/07/13 12:59						

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Reported:
 06/16/13 08:31

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 3050138 - Total Solids (Dry Weight)						Soil						
Duplicate (3050138-DUP8)						Prepared: 05/06/13 19:27 Analyzed: 05/07/13 12:59						
QC Source Sample: Other (A3E0137-06)												
Apex SOP												
% Solids	92.4	---	1.00	% by Weight	1	---	87.2	---	---	6	20%	
Batch 3050189 - Total Solids (Dry Weight)						Soil						
Duplicate (3050189-DUP1)						Prepared: 05/07/13 16:27 Analyzed: 05/08/13 09:19						
QC Source Sample: BL-TB-1F,E,D,C,B,A-050113 (A3E0083-11)												
Apex SOP												
% Solids	63.6	---	1.00	% by Weight	1	---	63.2	---	---	0.6	20%	
Duplicate (3050189-DUP2)						Prepared: 05/07/13 16:27 Analyzed: 05/08/13 09:19						
QC Source Sample: Other (A3E0151-06)												
Apex SOP												
% Solids	75.1	---	1.00	% by Weight	1	---	74.2	---	---	1	20%	
Duplicate (3050189-DUP3)						Prepared: 05/07/13 17:06 Analyzed: 05/08/13 09:19						
QC Source Sample: Other (A3E0157-02)												
Apex SOP												
% Solids	86.7	---	1.00	% by Weight	1	---	86.5	---	---	0.2	20%	
Batch 3050200 - Total Solids (Dry Weight)						Soil						
Duplicate (3050200-DUP1)						Prepared: 05/08/13 09:25 Analyzed: 05/08/13 10:45						
QC Source Sample: BL-TB-2A,B-050113 (A3E0083-04)												
Apex SOP												
% Solids	84.0	---	1.00	% by Weight	1	---	83.0	---	---	1	20%	

Apex Laboratories

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Engineering/Remediation Resource Group, Inc
 4585 Pacheco Blvd, Suite 200 (Corporate address)
 Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

SAMPLE PREPARATION INFORMATION

Anions by EPA 300.0/9056A (Ion Chromatography)

Prep: Method Prep: Ag

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3050120							
A3E0083-12	Water	EPA 300.0	05/01/13 13:43	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-14	Water	EPA 300.0	05/01/13 14:14	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-16	Water	EPA 300.0	05/01/13 14:31	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-17	Water	EPA 300.0	05/01/13 14:31	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-20	Water	EPA 300.0	05/02/13 08:52	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-22	Water	EPA 300.0	05/02/13 09:18	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-24	Water	EPA 300.0	05/02/13 09:54	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-25	Water	EPA 300.0	05/02/13 09:41	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-26	Water	EPA 300.0	05/02/13 10:28	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-27	Water	EPA 300.0	05/02/13 10:37	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-28	Water	EPA 300.0	05/02/13 10:37	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-29	Water	EPA 300.0	05/02/13 10:50	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00
A3E0083-31	Water	EPA 300.0	05/02/13 11:16	05/06/13 08:30	10mL/10mL	10mL/10mL	1.00

Total Metals by EPA 6020 (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3050324							
A3E0083-19	Water	EPA 6020A	05/01/13 15:46	05/13/13 15:30	45mL/50mL	45mL/50mL	1.00

Prep: EPA 3051A

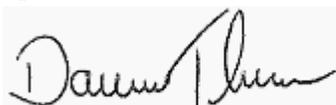
Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3050160							
A3E0083-01	Soil	EPA 6020A	05/01/13 09:57	05/07/13 09:08	0.457g/50mL	0.5g/50mL	1.09
A3E0083-04	Soil	EPA 6020A	05/01/13 10:45	05/07/13 09:08	0.463g/50mL	0.5g/50mL	1.08
A3E0083-11	Soil	EPA 6020A	05/01/13 12:01	05/07/13 09:08	0.465g/50mL	0.5g/50mL	1.08
A3E0083-13	Soil	EPA 6020A	05/01/13 13:43	05/07/13 09:08	0.506g/50mL	0.5g/50mL	0.99
A3E0083-15	Soil	EPA 6020A	05/01/13 14:14	05/07/13 09:08	0.505g/50mL	0.5g/50mL	0.99
A3E0083-18	Soil	EPA 6020A	05/01/13 14:14	05/07/13 09:08	0.453g/50mL	0.5g/50mL	1.10
A3E0083-21	Soil	EPA 6020A	05/02/13 08:52	05/07/13 09:08	0.48g/50mL	0.5g/50mL	1.04
A3E0083-23	Soil	EPA 6020A	05/02/13 09:18	05/07/13 09:08	0.452g/50mL	0.5g/50mL	1.11
A3E0083-30	Soil	EPA 6020A	05/02/13 11:16	05/07/13 09:08	0.478g/50mL	0.5g/50mL	1.05
A3E0083-32	Soil	EPA 6020A	05/01/13 14:31	05/07/13 09:08	0.503g/50mL	0.5g/50mL	0.99

Batch: 3050237

A3E0083-21RE1	Soil	EPA 6020A	05/02/13 08:52	05/09/13 09:04	0.457g/50mL	0.5g/50mL	1.09
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Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020 (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
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Dissolved Metals by EPA 6020 (ICPMS)

Prep: Matrix Matched Direct Inject

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
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Batch: 3050173

A3E0083-12	Water	EPA 6020A (Diss)	05/01/13 13:43	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-14	Water	EPA 6020A (Diss)	05/01/13 14:14	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-16	Water	EPA 6020A (Diss)	05/01/13 14:31	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-17	Water	EPA 6020A (Diss)	05/01/13 14:31	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-20	Water	EPA 6020A (Diss)	05/02/13 08:52	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-22	Water	EPA 6020A (Diss)	05/02/13 09:18	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-24	Water	EPA 6020A (Diss)	05/02/13 09:54	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-25	Water	EPA 6020A (Diss)	05/02/13 09:41	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-26	Water	EPA 6020A (Diss)	05/02/13 10:28	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-27	Water	EPA 6020A (Diss)	05/02/13 10:37	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-28	Water	EPA 6020A (Diss)	05/02/13 10:37	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-29	Water	EPA 6020A (Diss)	05/02/13 10:50	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00
A3E0083-31	Water	EPA 6020A (Diss)	05/02/13 11:16	05/07/13 11:46	45mL/50mL	45mL/50mL	1.00

Conventional Chemistry Parameters

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
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Batch: 3050100

A3E0083-19	Water	EPA 150.1	05/01/13 15:46	05/03/13 15:31	20mL/20mL	20mL/20mL	NA
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Prep: Method Prep: Non-Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
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Batch: 3050170

A3E0083-01	Soil	EPA 9045D	05/01/13 09:57	05/07/13 10:48	20g/20mL	20g/20mL	NA
A3E0083-04	Soil	EPA 9045D	05/01/13 10:45	05/07/13 10:48	20g/20mL	20g/20mL	NA
A3E0083-11	Soil	EPA 9045D	05/01/13 12:01	05/07/13 10:48	20g/20mL	20g/20mL	NA

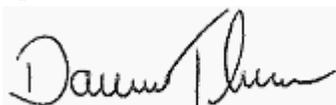
Prep: Total Suspended Solids

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
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Batch: 3050122

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Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

SAMPLE PREPARATION INFORMATION

Conventional Chemistry Parameters

Prep: Total Suspended Solids

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A3E0083-12	Water	SM 2540 C	05/01/13 13:43	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-14	Water	SM 2540 C	05/01/13 14:14	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-16	Water	SM 2540 C	05/01/13 14:31	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-17	Water	SM 2540 C	05/01/13 14:31	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-20	Water	SM 2540 C	05/02/13 08:52	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-22	Water	SM 2540 C	05/02/13 09:18	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-24	Water	SM 2540 C	05/02/13 09:54	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-25	Water	SM 2540 C	05/02/13 09:41	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-26	Water	SM 2540 C	05/02/13 10:28	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-27	Water	SM 2540 C	05/02/13 10:37	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-28	Water	SM 2540 C	05/02/13 10:37	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-29	Water	SM 2540 C	05/02/13 10:50	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-31	Water	SM 2540 C	05/02/13 11:16	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA

Batch: 3050123

A3E0083-12	Water	SM 2540 D	05/01/13 13:43	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-14	Water	SM 2540 D	05/01/13 14:14	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-16	Water	SM 2540 D	05/01/13 14:31	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-17	Water	SM 2540 D	05/01/13 14:31	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-20	Water	SM 2540 D	05/02/13 08:52	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-22	Water	SM 2540 D	05/02/13 09:18	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-24	Water	SM 2540 D	05/02/13 09:54	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-25	Water	SM 2540 D	05/02/13 09:41	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-26	Water	SM 2540 D	05/02/13 10:28	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-27	Water	SM 2540 D	05/02/13 10:37	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-28	Water	SM 2540 D	05/02/13 10:37	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-29	Water	SM 2540 D	05/02/13 10:50	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-31	Water	SM 2540 D	05/02/13 11:16	05/06/13 15:50	1N/A/1N/A	1N/A/1N/A	NA

Grain Size by ASTM D 422

Prep: ASTM D 421

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A3E0083-13	Soil	ASTM D 422m	05/01/13 13:43	05/09/13 11:34	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-15	Soil	ASTM D 422m	05/01/13 14:14	05/09/13 12:03	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-18	Soil	ASTM D 422m	05/01/13 14:14	05/09/13 12:26	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-21	Soil	ASTM D 422m	05/02/13 08:52	05/09/13 12:53	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories

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Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

SAMPLE PREPARATION INFORMATION

Grain Size by ASTM D 422

Prep: ASTM D 421

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A3E0083-23	Soil	ASTM D 422m	05/02/13 09:18	05/09/13 13:19	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-30	Soil	ASTM D 422m	05/02/13 11:16	05/09/13 13:56	1N/A/1N/A	1N/A/1N/A	NA
A3E0083-32	Soil	ASTM D 422m	05/01/13 14:31	05/09/13 14:16	1N/A/1N/A	1N/A/1N/A	NA

Conventional Chemistry Parameters - Dissolved

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3050115							
A3E0083-12	Water	SM 2320B (Diss)	05/01/13 13:43	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-14	Water	SM 2320B (Diss)	05/01/13 14:14	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-16	Water	SM 2320B (Diss)	05/01/13 14:31	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-17	Water	SM 2320B (Diss)	05/01/13 14:31	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-20	Water	SM 2320B (Diss)	05/02/13 08:52	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-22	Water	SM 2320B (Diss)	05/02/13 09:18	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-24	Water	SM 2320B (Diss)	05/02/13 09:54	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-25	Water	SM 2320B (Diss)	05/02/13 09:41	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-26	Water	SM 2320B (Diss)	05/02/13 10:28	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-27	Water	SM 2320B (Diss)	05/02/13 10:37	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-28	Water	SM 2320B (Diss)	05/02/13 10:37	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-29	Water	SM 2320B (Diss)	05/02/13 10:50	05/06/13 07:28	50mL/50mL	50mL/50mL	NA
A3E0083-31	Water	SM 2320B (Diss)	05/02/13 11:16	05/06/13 07:28	50mL/50mL	50mL/50mL	NA

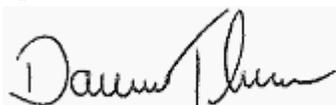
Lab Filtration

Prep: Lab Filtration

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 3050108							
A3E0083-12	Water	NA	05/01/13 13:43	05/03/13 18:17	200mL/200mL		NA
A3E0083-14	Water	NA	05/01/13 14:14	05/03/13 18:22	150mL/150mL		NA
A3E0083-16	Water	NA	05/01/13 14:31	05/03/13 18:26	150mL/150mL		NA
A3E0083-17	Water	NA	05/01/13 14:31	05/03/13 18:31	150mL/150mL		NA
A3E0083-20	Water	NA	05/02/13 08:52	05/03/13 18:37	150mL/150mL		NA
A3E0083-22	Water	NA	05/02/13 09:18	05/03/13 18:43	150mL/150mL		NA
A3E0083-24	Water	NA	05/02/13 09:54	05/03/13 18:48	150mL/150mL		NA
A3E0083-25	Water	NA	05/02/13 09:41	05/03/13 18:59	150mL/150mL		NA
A3E0083-26	Water	NA	05/02/13 10:28	05/03/13 19:04	200mL/200mL		NA

Apex Laboratories

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Engineering/Remediation Resource Group, Inc
 4585 Pacheco Blvd, Suite 200 (Corporate address)
 Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
 Project Number: 2010-084
 Project Manager: Brain Wetzsteon

Reported:
 06/16/13 08:31

SAMPLE PREPARATION INFORMATION

Lab Filtration

Prep: Lab Filtration

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A3E0083-27	Water	NA	05/02/13 10:37	05/03/13 19:10	150mL/150mL		NA
A3E0083-28	Water	NA	05/02/13 10:37	05/03/13 19:22	150mL/150mL		NA
A3E0083-29	Water	NA	05/02/13 10:50	05/03/13 19:28	150mL/150mL		NA
A3E0083-31	Water	NA	05/02/13 11:16	05/03/13 19:33	150mL/150mL		NA

Apex Laboratories



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Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

Notes and Definitions

Qualifiers:

- FILT1 Sample was lab filtered and acid preserved prior to analysis. See sample preparation section of report for date and time of filtration.
- FILT3 This is a laboratory filtration blank, associated with filtration batch 3050108.
- GS-01 See detailed Particle Size Analysis results, accumulation curves, and Case Narratives at the end of this report.
- H-06 This sample was received, or the analysis requested, outside the recommended holding time.
- J Estimated Result . Result detected below the lowest point of the calibration curve, but above the specified MDL.
- Q-01 Spike recovery and/or RPD is outside acceptance limits.
- Q-03 Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
- Q-04 Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
- Q-16 Reanalysis of an original Batch QC sample.
- Q-17 RPD between original and duplicate sample is outside of established control limits.
- Q-42 Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)
- R-04 Reporting levels elevated due to dilution necessary for analysis.
- U Analyte included in the analysis, but not detected

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.

Apex Laboratories

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Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brain Wetzsteon

Reported:
06/16/13 08:31

--- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

*** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Engineering/Remediation Resource Group, Inc
4585 Pacheco Blvd, Suite 200 (Corporate address)
Martinez, CA 94553

Project: **Blue Ledge Mine 2013**
Project Number: 2010-084
Project Manager: Brian Wetzeleon

Reported:
06/13/08:31

APEX LABS

CHAIN OF CUSTODY

Lab # A3E0083 COC 3 of 3

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: <u>ERRG</u>		Project Mgr: <u>Brian Wetzeleon</u>		Project Name: <u>Blue Ledge Mine</u>		Project # <u>2010-084</u>	
Address: <u>616 First Ave, Seattle, WA 98104</u>		Phone: <u>925-969-0950</u>		Fax: <u>925-969-0951</u>		Email: <u>brian.wetzeleon@ERRG.com</u>	
Sampled by: <u>Annica Nord / Kim Jones</u>		ANALYSIS REQUEST					
Site Location: <u>OR</u> <u>WA</u>	Other: <u>CA</u>	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	
SAMPLE ID							
1	<u>BL-CS-EC06-050213</u>	<u>13</u>	<u>5/21/08</u>	<u>918</u>	<u>Soil</u>	<u>3</u>	
2	<u>BL-DW-12620-050213</u>	<u>24</u>	<u>9/11</u>	<u>941</u>	<u>water</u>	<u>2</u>	
3	<u>BL-DW-12620-050213</u>	<u>25</u>	<u>9/11</u>	<u>941</u>	<u>water</u>	<u>2</u>	
4	<u>BL-DW-541-050213</u>	<u>26</u>	<u>10/28</u>	<u>1028</u>	<u>water</u>	<u>6</u>	<u>please perform MS/MSD</u>
5	<u>BL-DW-17607-050213</u>	<u>27</u>	<u>10/27</u>	<u>1037</u>	<u>water</u>	<u>2</u>	
6	<u>BL-DW-17607-050213</u>	<u>28</u>	<u>10/27</u>	<u>1037</u>	<u>water</u>	<u>2</u>	
7	<u>BL-DW-402-050213</u>	<u>29</u>	<u>10/30</u>	<u>1050</u>	<u>water</u>	<u>2</u>	
8	<u>BL-CS-EC04-050213</u>	<u>30</u>	<u>11/16</u>	<u>1116</u>	<u>Soil</u>	<u>3</u>	
9	<u>BL-DW-EC04-050213</u>	<u>31</u>	<u>11/16</u>	<u>1116</u>	<u>water</u>	<u>2</u>	
Normal Turn Around Time (TAT) = 7-10 Business Days		<input checked="" type="radio"/> YES		NO		SPECIAL INSTRUCTIONS:	
TAT Requested (circle)		1 Day		2 Day		3 Day	
		4 DAY		5 DAY		Other: _____	
SAMPLES ARE HELD FOR 30 DAYS		see page 1					
RELINQUISHED BY:		please send sample results to <u>brian.wetzeleon@errg.com</u> <u>annica.nord@errg.com</u>					
Signature: <u>[Signature]</u>	Date: <u>5-3-08</u>	Signature: _____	Date: _____	Signature: _____	Date: _____	Signature: _____	Date: _____
Printed Name: <u>Annica Nord</u>	Time: <u>17:00</u>	Printed Name: <u>Lisa Reger</u>	Time: <u>0910</u>	Printed Name: _____	Time: _____	Printed Name: _____	Time: _____
Company: <u>ERRG</u>	Company: <u>shipped via FedEx</u>	Company: <u>Ape</u>	Company: _____	Company: _____	Company: _____	Company: _____	Company: _____

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Apex Laboratories

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A3E0083-13	Client Sample ID:	BL-CS-JC-10-050113	Batch Number:	3050258
Data Entered by:	JSJ	Date:	05/15/13	Data Reviewed by:	JPW
Date:				Date:	05/16/13
Sample Description:	Gravelly SAND with trace silt		Max Particle Size:	Gravel	
Particle Shape:	Angular to sub-rounded		Hardness	Hard and durable	

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	11.283	321.536	310.25	0.34	309.2

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.349	140.604	134.26	134.26	43.4	56.6
10	2.00	6.240	74.361	68.12	202.38	22.0	34.5
Pan		5.643	113.007	107.36	309.74	34.6	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9966		E83-13	1.338	11.266	11.232	0.34

Hydrometer Analysis

Start Date/Time	5/9/2013	11:34	Dispersing Agent	NaPO ₃
Air Dry Sample Wt. for Hydrometer Test (g)	97.033		G _s Correction Factor (a)	1.000
Percent Passing No.10 Sieve	34.5		Specific Gravity (G _s)	2.65
Dry Weight of Soil Tested (g)	96.70		Corrected Dry Weight of Soil Tested (g) (W)	279.91

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	9	21.9	2.41	0.9	14.7	0.01332	0.051	0.30
2	9	21.9	2.41	0.9	14.7	0.01332	0.036	0.30
4	9	21.9	2.41	0.9	14.7	0.01332	0.026	0.30
8	8	21.8	1.38	0.5	14.8	0.01332	0.018	0.17
15	7.5	21.8	0.88	0.3	14.8	0.01332	0.013	0.11
30	7	21.8	0.38	0.1	15	0.01332	0.009	0.05
60	7	21.9	0.41	0.1	15	0.01332	0.007	0.05
90	7	22.1	0.48	0.2	15	0.01332	0.005	0.06
120	7	22.4	0.58	0.2	15	0.01332	0.005	0.07
240	6.5	23.1	0.32	0.1	15	0.01317	0.003	0.04
360	6	23.6		0.0	15.2	0.01301	0.003	0.00
1440	7	22.3	0.55	0.2	15	0.01332	0.001	0.07

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	6.338	64.805	58.47	267.07	20.9	13.7
40	0.425	1.337	25.667	24.33	293.99	8.7	5.0
60	0.250	1.341	7.739	6.40	301.07	2.3	2.7
100	0.150	1.344	3.662	2.32	303.63	0.8	1.9
140	0.105	1.341	2.280	0.94	304.67	0.3	1.5
200	0.075	1.342	2.312	0.97	305.74	0.3	1.2
230	0.063	1.351	1.780	0.43	306.22	0.2	1.0
			Sum	93.85	230 Minus	2.85	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: BL-CS-JC-10-050113 (A3E0083-13)

Grain Size Analysis Summary from Sieving and Hydrometer Testing	Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel			43.42
Retained on No. 4 sieve	4.75	56.58	43.42
Sand			55.41
Coarse sand, passing No. 4 sieve and retained on No. 10 sieve	2.00	34.55	22.03
Coarse sand, passing No.10 sieve and retained on No. 20 sieve	0.8500	13.66	20.89
Medium sand, passing No.20 sieve and retained on No. 40 sieve	0.4250	4.97	8.69
Medium sand, passing No.40 sieve and retained on No. 60 sieve	0.2500	2.68	2.29
Medium sand, passing No. 60 sieve and retained on No.100 sieve	0.1500	1.85	0.83
Fine sand, passing No. 100 sieve and retained on No.140 sieve	0.1060	1.52	0.34
Fine sand passing No. 140 sieve and retained on No. 200 sieve	0.0750	1.17	0.35
Silt and Clay (Measurements in the Clay fraction are noted)			1.2
Silt passing No. 200 sieve and retained on No. 230 sieve	0.0630	1.02	0.15
Hydrometer Test	0.0511	0.3	0.72
Hydrometer Test	0.0361	0.3	0
Hydrometer Test	0.0255	0.3	0
Hydrometer Test	0.0181	0.17	0.13
Hydrometer Test	0.0132	0.11	0.06
Hydrometer Test	0.0094	0.05	0.06
Hydrometer Test	0.0067	0.05	0
Hydrometer Test	0.0054	0.06	0
Hydrometer Test Clay	0.0047	0.07	0
Hydrometer Test Clay	0.0033	0.04	0.01
Hydrometer Test Clay	0.0027	0.04	0
Hydrometer Test Clay	0.0014	0.07	0

Grain Size Summary	Percent of Total Sample
Gravel	43.4
Sand	55.4
Coarse sand	42.9
Medium sand	11.8
Fine sand	0.7
Silt	1.1
Clay	0.1

Case Narrative for Sample ID: BL-CS-JC-10-050113 (A3E0083-13)

No difficulty dispersing the fraction passing the No. 10 sieve.

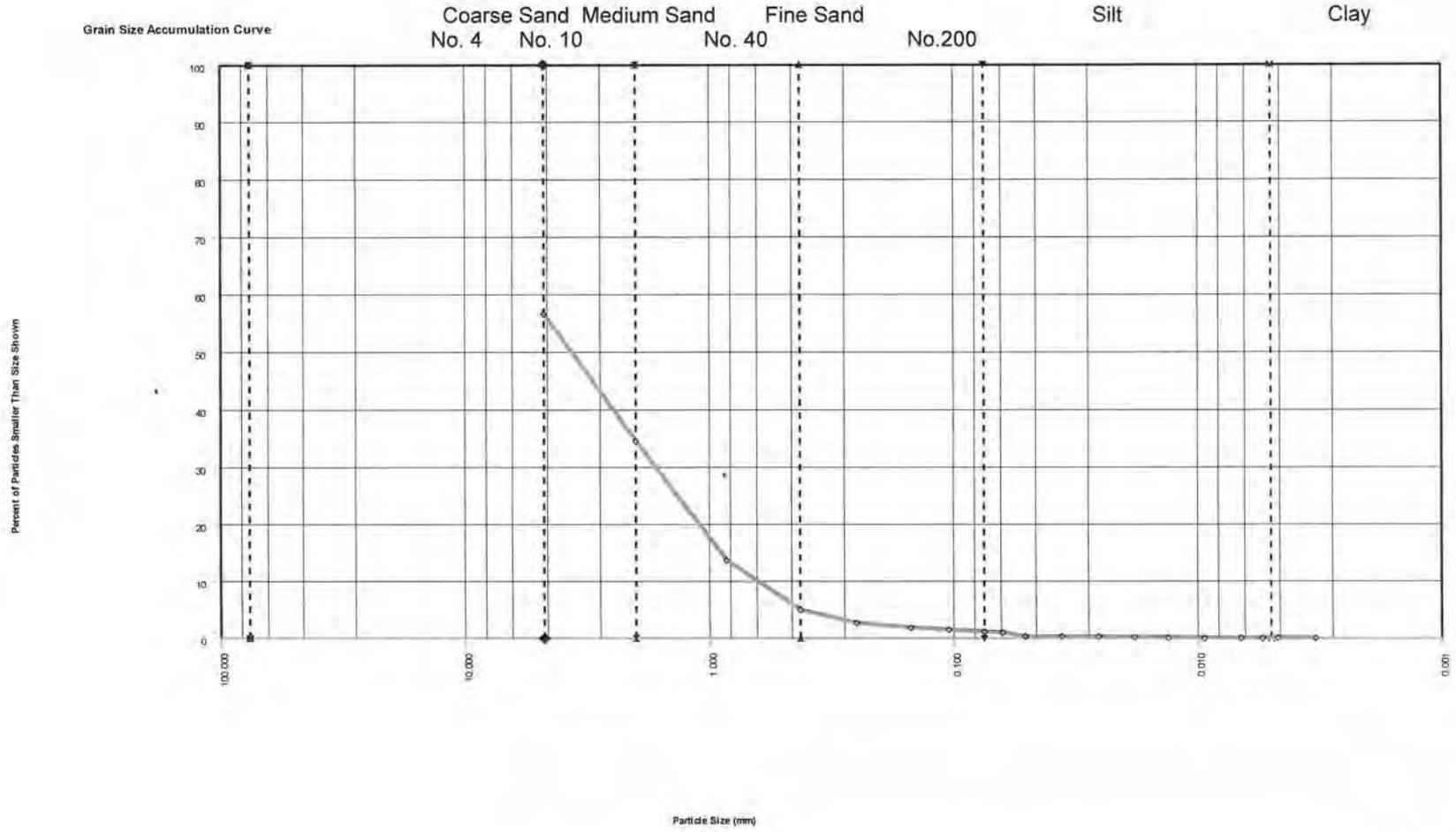
Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.



Expires 12/31/13

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified



Sample ID: BL-CS-JC-10-050113 (A3E0083-13)				
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to sub-rounded	Hard and durable	Gravelly SAND with trace silt

A3E0083 FINAL 06 16 13 0831 ERRG Blue Ledge Mine 2013 with Grain Size

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A3E0083-15	Client Sample ID:	BL-CS-JC-09-050113	Batch Number:	3050258
Data Entered by:	JSJ	Date:	05/15/13	Data Reviewed by:	JPW
Date:				Date:	05/16/13
Sample Description:	SAND with some silt and trace gravel and clay		Max Particle Size:	Gravel	
Particle Shape:	Angular to sub-rounded		Hardness	Hard and durable	

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	4.727	224.964	220.24	1.02	218.0

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	1.345	26.163	24.82	24.82	11.4	88.6
10	2.00	6.269	43.121	36.85	61.67	16.9	71.7
Pan		4.757	162.759	158.00	219.67	71.7	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9899		E83-15	1.348	27.804	27.536	1.02

Hydrometer Analysis

Start Date/Time	5/9/2013	12:03	Dispersing Agent	NaPO ₃
Air Dry Sample Wt. for Hydrometer Test (g)	103.834		G _s Correction Factor (a)	1.000
Percent Passing No.10 Sieve	71.7		Specific Gravity (G _s)	2.65
Dry Weight of Soil Tested (g)	102.78		Corrected Dry Weight of Soil Tested (g) (W)	143.33

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	19	21.9	12.41	8.7	13	0.01332	0.048	6.21
2	15.5	21.9	8.91	6.2	13.5	0.01332	0.035	4.46
4	13	21.9	6.41	4.5	14	0.01332	0.025	3.21
8	12	21.9	5.41	3.8	14.2	0.01332	0.018	2.71
15	11	21.8	4.38	3.1	14.3	0.01332	0.013	2.19
30	10	22	3.44	2.4	14.5	0.01332	0.009	1.72
60	9	22.2	2.51	1.8	14.7	0.01332	0.007	1.26
90	8.5	22.3	2.05	1.4	14.7	0.01332	0.005	1.02
120	8	22.5	1.62	1.1	14.8	0.01317	0.005	0.81
240	8	23.2	1.86	1.3	14.8	0.01317	0.003	0.93
360	7.5	23.3	1.39	1.0	14.8	0.01317	0.003	0.70
1440	8	22.3	1.55	1.1	14.8	0.01332	0.001	0.77

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	6.337	36.325	29.99	107.30	20.9	50.8
40	0.425	1.340	27.623	26.28	147.30	18.3	32.5
60	0.250	1.345	17.687	16.34	172.16	11.4	21.0
100	0.150	1.350	11.932	10.58	188.27	7.4	13.7
140	0.105	1.330	5.882	4.55	195.19	3.2	10.5
200	0.075	1.337	4.969	3.63	200.72	2.5	8.0
230	0.063	1.342	2.719	1.38	202.81	1.0	7.0
			Sum	92.76	230 Minus	10.03	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: BL-CS-JC-09-050113 (A3E0083-15)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				11.38
	Retained on No. 4 sieve	4.75	88.62	11.38
Sand				80.66
	Coarse sand, passing No. 4 sieve and retained on No. 10 sieve	2.00	71.71	16.9
	Coarse sand, passing No.10 sieve and retained on No. 20 sieve	0.8500	50.79	20.92
	Medium sand, passing No.20 sieve and retained on No. 40 sieve	0.4250	32.45	18.34
	Medium sand, passing No.40 sieve and retained on No. 60 sieve	0.2500	21.05	11.4
	Medium sand, passing No. 60 sieve and retained on No.100 sieve	0.1500	13.67	7.38
	Fine sand, passing No. 100 sieve and retained on No.140 sieve	0.1060	10.49	3.18
	Fine sand passing No. 140 sieve and retained on No. 200 sieve	0.0750	7.96	2.53
Silt and Clay (Measurements in the Clay fraction are noted)				8.03
	Silt passing No. 200 sieve and retained on No. 230 sieve	0.0630	7	0.96
	Hydrometer Test	0.0480	6.21	0.79
	Hydrometer Test	0.0346	4.46	1.75
	Hydrometer Test	0.0249	3.21	1.25
	Hydrometer Test	0.0177	2.71	0.5
	Hydrometer Test	0.0130	2.19	0.52
	Hydrometer Test	0.0093	1.72	0.47
	Hydrometer Test	0.0066	1.26	0.47
	Hydrometer Test	0.0054	1.02	0.23
	Hydrometer Test Clay	0.0046	0.81	0.22
	Hydrometer Test Clay	0.0033	0.93	0
	Hydrometer Test Clay	0.0027	0.7	0.11
	Hydrometer Test Clay	0.0014	0.77	0

Grain Size Summary

Percent of Total Sample

Gravel	11.4
Sand	80.7
Coarse sand	37.8
Medium sand	37.1
Fine sand	5.7
Silt	6.9
Clay	1.1

Case Narrative for Sample ID: BL-CS-JC-09-050113 (A3E0083-15)

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.

Hydrometer readings for 1, 2, and 4 minutes are estimated due to the presence of foam.

Trace organic debris (roots, branches) present in +4 and +10 fractions.



Expires 12/31/13

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A3E0083-18	Client Sample ID:	BL-CS-JC-09-050113DUP	Batch Number:	3050258
Data Entered by:	JSJ	Date:	05/15/13	Data Reviewed by:	JPW
Date:				Date:	05/16/13
Sample Description:	Gravelly SAND with some silt and trace clay		Max Particle Size:	Gravel	
Particle Shape:	Angular to sub-rounded		Hardness	Hard and durable	

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.784	193.654	187.87	1.05	185.9

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.232	63.718	57.49	57.49	30.9	69.1
10	2.00	1.345	26.782	25.44	82.92	13.7	55.4
Pan		5.800	109.902	104.10	187.03	55.4	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9896		E83-18	1.337	13.123	13.000	1.05

Hydrometer Analysis

Start Date/Time	5/9/2013	12:26	Dispersing Agent	NaPO ₃
Air Dry Sample Wt. for Hydrometer Test (g)	91.343		G _s Correction Factor (a)	1.000
Percent Passing No.10 Sieve	55.4		Specific Gravity (G _s)	2.65
Dry Weight of Soil Tested (g)	90.39		Corrected Dry Weight of Soil Tested (g) (W)	163.17

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	15.5	22.2	9.01	5.5	13.5	0.01332	0.049	3.06
2	13	22.2	6.51	4.0	14	0.01332	0.035	2.21
4	12	22.2	5.51	3.4	14.2	0.01332	0.025	1.87
8	10	22.2	3.51	2.2	14.5	0.01332	0.018	1.19
15	9.5	22.2	3.01	1.8	14.5	0.01332	0.013	1.02
30	9.5	22.2	3.01	1.8	14.5	0.01332	0.009	1.02
60	8	22.4	1.58	1.0	14.8	0.01332	0.007	0.54
90	8	22.5	1.62	1.0	14.8	0.01317	0.005	0.55
120	7.5	22.5	1.12	0.7	14.8	0.01317	0.005	0.38
240	7	23.2	0.86	0.5	15	0.01317	0.003	0.29
360	7	23.5	0.96	0.6	15	0.01301	0.003	0.33
1440	7	22.7	0.68	0.4	15	0.01317	0.001	0.23

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.339	21.534	20.20	105.94	12.4	43.0
40	0.425	1.344	21.153	19.81	128.51	12.1	30.9
60	0.250	1.358	16.710	15.35	146.01	9.4	21.5
100	0.150	1.340	14.182	12.84	160.65	7.9	13.6
140	0.105	1.341	7.575	6.23	167.75	3.8	9.8
200	0.075	1.344	6.309	4.97	173.41	3.0	6.7
230	0.063	1.346	3.099	1.75	175.41	1.1	5.7
			Sum	81.15	230 Minus	9.24	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: BL-CS-JC-09-050113DUP (A3E0083-18)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				30.92
	Retained on No. 4 sieve	4.75	69.08	30.92
Sand				62.34
	Coarse sand, passing No. 4 sieve and retained on No. 10 sieve	2.00	55.4	13.68
	Coarse sand, passing No.10 sieve and retained on No. 20 sieve	0.8500	43.02	12.38
	Medium sand, passing No.20 sieve and retained on No. 40 sieve	0.4250	30.88	12.14
	Medium sand, passing No.40 sieve and retained on No. 60 sieve	0.2500	21.47	9.41
	Medium sand, passing No. 60 sieve and retained on No.100 sieve	0.1500	13.6	7.87
	Fine sand, passing No. 100 sieve and retained on No.140 sieve	0.1060	9.78	3.82
	Fine sand passing No. 140 sieve and retained on No. 200 sieve	0.0750	6.74	3.04
Silt and Clay (Measurements in the Clay fraction are noted)				6.74
	Silt passing No. 200 sieve and retained on No. 230 sieve	0.0630	5.66	1.07
	Hydrometer Test	0.0489	3.06	2.6
	Hydrometer Test	0.0352	2.21	0.85
	Hydrometer Test	0.0251	1.87	0.34
	Hydrometer Test	0.0179	1.19	0.68
	Hydrometer Test	0.0131	1.02	0.17
	Hydrometer Test	0.0093	1.02	0
	Hydrometer Test	0.0066	0.54	0.49
	Hydrometer Test	0.0053	0.55	0
	Hydrometer Test Clay	0.0046	0.38	0.16
	Hydrometer Test Clay	0.0033	0.29	0.09
	Hydrometer Test Clay	0.0027	0.33	0
	Hydrometer Test Clay	0.0013	0.23	0.06

Grain Size Summary	Percent of Total Sample
Gravel	30.9
Sand	62.3
Coarse sand	26.1
Medium sand	29.4
Fine sand	6.9
Silt	6.2
Clay	0.5

Case Narrative for Sample ID: BL-CS-JC-09-050113DUP (A3E0083-18)

No difficulty dispersing the fraction passing the No. 10 sieve.
Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.
The assumed specific gravity used in the calculations was 2.65.
Hydrometer readings for 1, 2, and 4 minutes are estimated due to the presence of foam.
Trace organic debris (roots, bark, etc.) present in +4 and +10 fractions.



Expires 12/31/13

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A3E0083-21	Client Sample ID:	BL-CS-JC01-050213	Batch Number:	3050258
Data Entered by:	JSJ	Date:	05/15/13	Data Reviewed by:	JPW
Date:				Date:	05/16/13
Sample Description:	SAND with some silt and trace clay		Max Particle Size:	Coarse sand	
Particle Shape:	Angular to sub-rounded		Hardness	Hard and durable	

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	4.683	278.655	273.97	0.48	272.7

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	0.000	0.000	0.00	0.00	0.0	100.0
10	2.00	1.340	7.888	6.55	6.55	2.4	97.6
Pan		4.746	271.992	267.25	273.79	97.5	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9952		E83-21	1.342	29.482	29.348	0.48

Hydrometer Analysis

Start Date/Time	5/9/2013	12:53	Dispersing Agent	NaPO ₃
Air Dry Sample Wt. for Hydrometer Test (g)	107.729		G _s Correction Factor (a)	1.000
Percent Passing No.10 Sieve	97.6		Specific Gravity (G _s)	2.65
Dry Weight of Soil Tested (g)	107.22		Corrected Dry Weight of Soil Tested (g) (W)	109.85

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	12	22.5	5.62	5.1	14.2	0.01317	0.050	4.99
2	10	22.5	3.62	3.3	14.5	0.01317	0.035	3.21
4	9	22.5	2.62	2.4	14.7	0.01317	0.025	2.32
8	9	22.6	2.65	2.4	14.7	0.01317	0.018	2.35
15	8.5	22.5	2.12	1.9	14.7	0.01317	0.013	1.88
30	8	22.5	1.62	1.5	14.8	0.01317	0.009	1.44
60	8	22.4	1.58	1.4	14.8	0.01332	0.007	1.40
90	8	22.7	1.68	1.5	14.8	0.01317	0.005	1.50
120	7	22.8	0.72	0.7	15	0.01317	0.005	0.64
240	7	23.5	0.96	0.9	15	0.01301	0.003	0.85
360	7	23.8	1.06	1.0	15	0.01301	0.003	0.94
1440	7	22.9	0.75	0.7	15	0.01317	0.001	0.67

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.347	16.312	14.97	43.67	13.6	84.0
40	0.425	1.343	24.544	23.20	101.23	21.1	62.9
60	0.250	1.343	24.578	23.24	158.87	21.2	41.7
100	0.150	1.338	24.844	23.51	217.18	21.4	20.3
140	0.105	1.346	10.735	9.39	240.47	8.5	11.8
200	0.075	1.337	7.066	5.73	254.68	5.2	6.5
230	0.063	1.344	2.953	1.61	258.67	1.5	5.1
			Sum	101.63	230 Minus	5.58	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: BL-CS-JC01-050213 (A3E0083-21)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				0
	Retained on No. 4 sieve	4.75	100	0
Sand				93.45
	Coarse sand, passing No. 4 sieve and retained on No. 10 sieve	2.00	97.6	2.4
	Coarse sand, passing No.10 sieve and retained on No. 20 sieve	0.8500	83.98	13.62
	Medium sand, passing No.20 sieve and retained on No. 40 sieve	0.4250	62.86	21.12
	Medium sand, passing No.40 sieve and retained on No. 60 sieve	0.2500	41.71	21.15
	Medium sand, passing No. 60 sieve and retained on No.100 sieve	0.1500	20.31	21.4
	Fine sand, passing No. 100 sieve and retained on No.140 sieve	0.1060	11.76	8.55
	Fine sand passing No. 140 sieve and retained on No. 200 sieve	0.0750	6.55	5.22
Silt and Clay (Measurements in the Clay fraction are noted)				6.58
	Silt passing No. 200 sieve and retained on No. 230 sieve	0.0630	5.08	1.46
	Hydrometer Test	0.0496	4.99	0.09
	Hydrometer Test	0.0355	3.21	1.78
	Hydrometer Test	0.0252	2.32	0.89
	Hydrometer Test	0.0179	2.35	0
	Hydrometer Test	0.0130	1.88	0.44
	Hydrometer Test	0.0093	1.44	0.44
	Hydrometer Test	0.0066	1.4	0.03
	Hydrometer Test	0.0053	1.5	0
	Hydrometer Test Clay	0.0047	0.64	0.77
	Hydrometer Test Clay	0.0033	0.85	0
	Hydrometer Test Clay	0.0027	0.94	0
	Hydrometer Test Clay	0.0013	0.67	0

Grain Size Summary	Percent of Total Sample
Gravel	0.0
Sand	93.5
Coarse sand	16.0
Medium sand	63.7
Fine sand	13.8
Silt	5.1
Clay	1.4

Case Narrative for Sample ID: BL-CS-JC01-050213 (A3E0083-21)

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

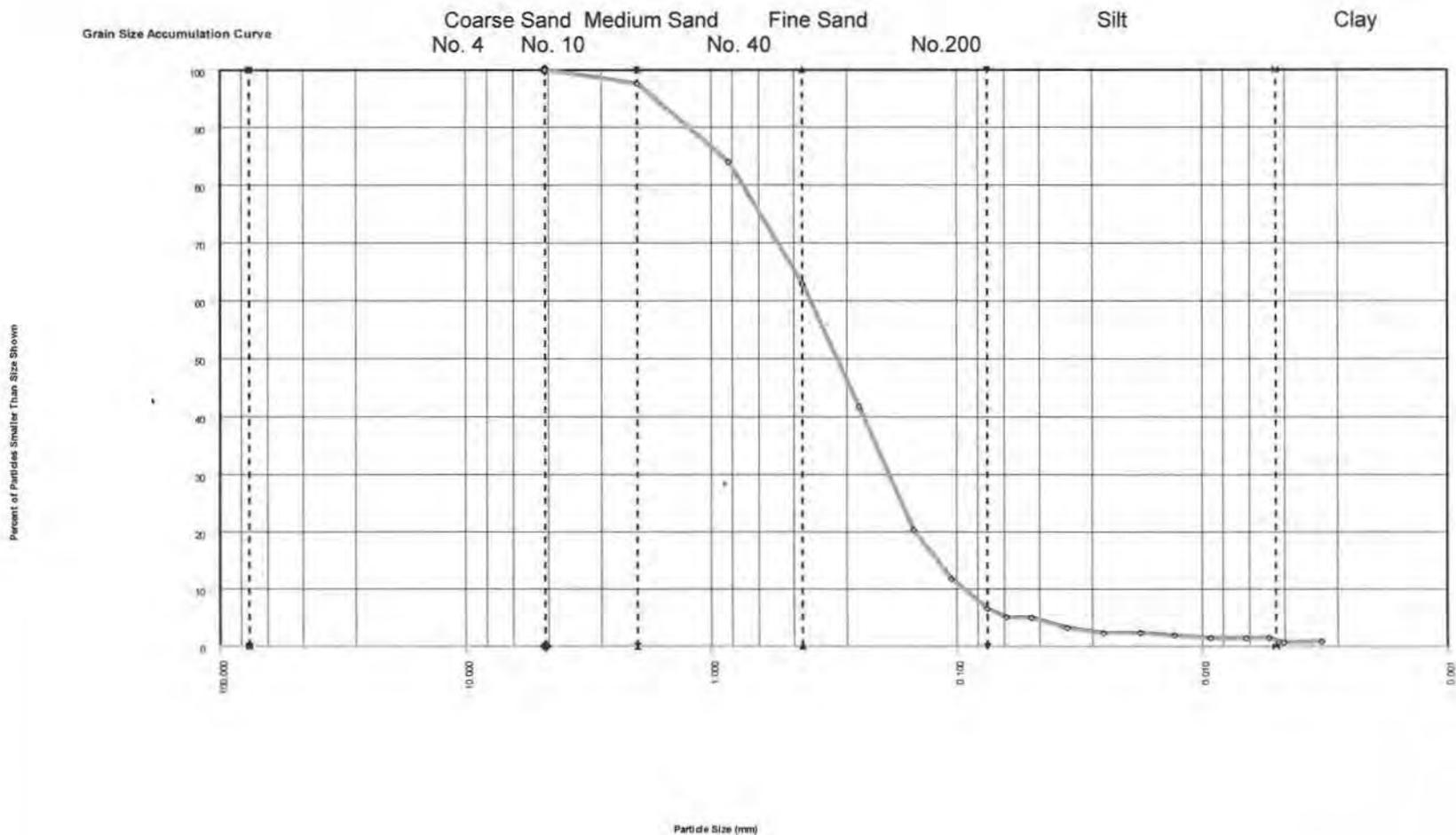
The assumed specific gravity used in the calculations was 2.65.

Hydrometer reading at 1 minute is estimated due to the presence of foam.



Express 12/31/13

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified



Sample ID: BL-CS-JC01-050213 (A3E0083-21)				
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Coarse sand	Angular to sub-rounded	Hard and durable	SAND with some silt and trace clay

A3E0083 FINAL 06 16 13 0831 ERRRG Blue Ledge Mine 2013 with Grain Size

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A3E0083-23	Client Sample ID:	BL-CS-EC06-050213	Batch Number:	3050258
Data Entered by:	JSJ	Date:	05/15/13	Data Reviewed by:	JPW
Date:				Date:	05/16/13
Sample Description:	SAND with trace silt and clay		Max Particle Size:	Coarse sand	
Particle Shape:	Sub-angular		Hardness	Hard and durable	

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	5.758	275.343	269.59	0.33	268.7

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	0.000	0.000	0.00	0.00	0.0	100.0
10	2.00	1.343	1.740	0.40	0.40	0.1	99.9
Pan		5.769	274.860	269.09	269.49	99.8	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9967		E83-23	1.340	32.021	31.921	0.33

Hydrometer Analysis

Start Date/Time	5/9/2013	13:19	Dispersing Agent	NaPO ₃
Air Dry Sample Wt. for Hydrometer Test (g)	109.757		G _s Correction Factor (a)	1.000
Percent Passing No.10 Sieve	99.9		Specific Gravity (G _s)	2.65
Dry Weight of Soil Tested (g)	109.40		Corrected Dry Weight of Soil Tested (g) (W)	109.56

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	10	22.6	3.65	3.3	14.5	0.01317	0.050	3.33
2	9	22.6	2.65	2.4	14.7	0.01317	0.036	2.41
4	9	22.6	2.65	2.4	14.7	0.01317	0.025	2.41
8	9	22.5	2.62	2.4	14.7	0.01317	0.018	2.38
15	8	22.5	1.62	1.5	14.8	0.01317	0.013	1.47
30	8	22.5	1.62	1.5	14.8	0.01317	0.009	1.47
60	7	22.7	0.68	0.6	15	0.01317	0.007	0.62
90	7	22.7	0.68	0.6	15	0.01317	0.005	0.62
120	7	22.9	0.75	0.7	15	0.01317	0.005	0.69
240	6	23.6		0.0	15.2	0.01301	0.003	0.00
360	6	23.6		0.0	15.2	0.01301	0.003	0.00
1440	6.5	23	0.29	0.3	15	0.01317	0.001	0.26

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.360	6.745	5.39	13.60	4.9	94.9
40	0.425	1.336	29.395	28.06	82.39	25.6	69.3
60	0.250	1.340	40.831	39.29	178.72	35.9	33.5
100	0.150	1.345	25.042	23.70	236.82	21.6	11.8
140	0.105	1.337	6.999	5.66	250.70	5.2	6.7
200	0.075	1.338	4.040	2.70	257.33	2.5	4.2
230	0.063	1.332	2.048	0.72	259.08	0.7	3.5
			Sum	105.51	230 Minus	3.89	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: BL-CS-EC06-050213 (A3E0083-23)

Grain Size Analysis Summary from Sieving and Hydrometer Testing	Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel			0
Retained on No. 4 sieve	4.75	100	0
Sand			95.8
Coarse sand, passing No. 4 sieve and retained on No. 10 sieve	2.00	99.85	0.15
Coarse sand, passing No.10 sieve and retained on No. 20 sieve	0.8500	94.94	4.92
Medium sand, passing No.20 sieve and retained on No. 40 sieve	0.4250	69.33	25.61
Medium sand, passing No.40 sieve and retained on No. 60 sieve	0.2500	33.46	35.86
Medium sand, passing No. 60 sieve and retained on No.100 sieve	0.1500	11.84	21.63
Fine sand, passing No. 100 sieve and retained on No.140 sieve	0.1060	6.67	5.17
Fine sand passing No. 140 sieve and retained on No. 200 sieve	0.0750	4.2	2.47
Silt and Clay (Measurements in the Clay fraction are noted)			4.2
Silt passing No. 200 sieve and retained on No. 230 sieve	0.0630	3.55	0.65
Hydrometer Test	0.0501	3.33	0.22
Hydrometer Test	0.0357	2.41	0.91
Hydrometer Test	0.0252	2.41	0
Hydrometer Test	0.0179	2.38	0.03
Hydrometer Test	0.0131	1.47	0.91
Hydrometer Test	0.0093	1.47	0
Hydrometer Test	0.0066	0.62	0.85
Hydrometer Test	0.0054	0.62	0
Hydrometer Test	Clay	0.0047	0.69
Hydrometer Test	Clay	0.0033	0
Hydrometer Test	Clay	0.0027	0
Hydrometer Test	Clay	0.0013	0.36

Grain Size Summary	Percent of Total Sample
Gravel	0.0
Sand	95.8
Coarse sand	5.1
Medium sand	83.1
Fine sand	7.6
Silt	3.6
Clay	0.6

Case Narrative for Sample ID: BL-CS-EC06-050213 (A3E0083-23)

No difficulty dispersing the fraction passing the No. 10 sieve.

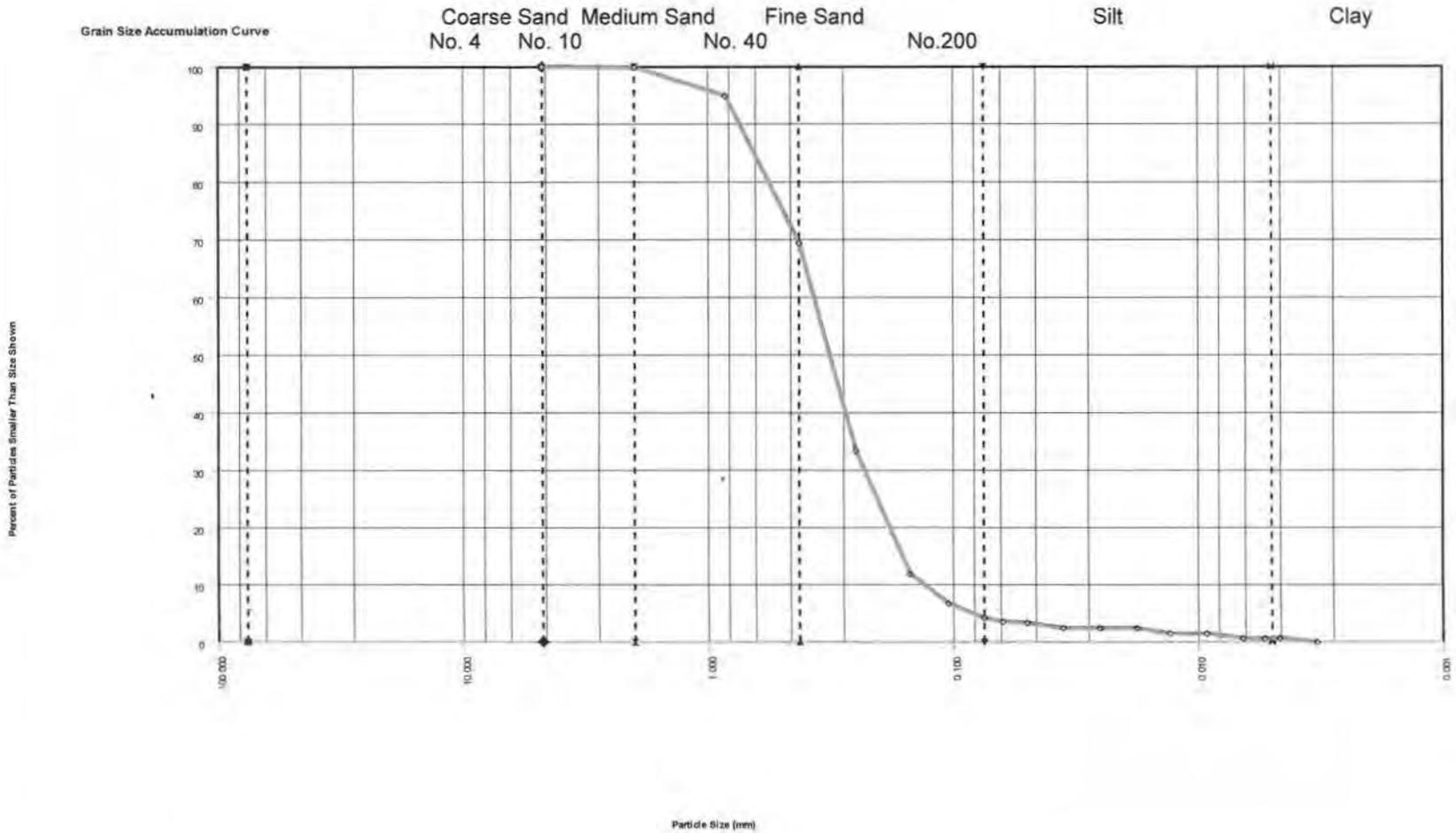
Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

The assumed specific gravity used in the calculations was 2.65.



Expires 12/31/13

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified



Sample ID: BL-CS-EC06-050213 (A3E0083-23)				
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Coarse sand	Sub-angular	Hard and durable	SAND with trace silt and clay

A3E0083 FINAL 06 16 13 0831 ERRRG Blue Ledge Mine 2013 with Grain Size

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A3E0083-30	Client Sample ID:	BL-CS-EC04-050213	Batch Number:	3050258
Data Entered by:	JSJ	Date:	05/15/13	Data Reviewed by:	JPW
Date:				Date:	05/16/13
Sample Description:	SAND with trace silt and clay		Max Particle Size:	Gravel	
Particle Shape:	Sub-angular to sub-rounded		Hardness	Hard and durable	

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	11.447	316.632	305.19	0.32	304.2

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	1.342	15.732	14.39	14.39	4.7	95.3
10	2.00	1.337	18.450	17.11	31.50	5.6	89.6
Pan		5.736	279.167	273.43	304.93	89.6	

Hygroscopic Moisture Correction

Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9968	E83-30	1.359	31.473	31.378	0.32

Hydrometer Analysis

Start Date/Time	5/9/2013	13:56	Dispersing Agent	NaPO ₃
Air Dry Sample WL for Hydrometer Test (g)	107.416		G _s Correction Factor (a)	1.000
Percent Passing No.10 Sieve	89.6		Specific Gravity (G _s)	2.65
Dry Weight of Soil Tested (g)	107.08		Corrected Dry Weight of Soil Tested (g) (W)	119.45

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	9	22.8	2.72	2.3	14.7	0.01317	0.050	2.04
2	9	22.8	2.72	2.3	14.7	0.01317	0.036	2.04
4	9	22.9	2.75	2.3	14.7	0.01317	0.025	2.07
8	8	22.8	1.72	1.4	14.8	0.01317	0.018	1.29
15	8	22.8	1.72	1.4	14.8	0.01317	0.013	1.29
30	8	22.8	1.72	1.4	14.8	0.01317	0.009	1.29
60	8	23	1.79	1.5	14.8	0.01317	0.007	1.34
90	7	23.1	0.82	0.7	15	0.01317	0.005	0.62
120	7	23.1	0.82	0.7	15	0.01317	0.005	0.62
240	7	23.8	1.06	0.9	15	0.01301	0.003	0.80
360	7	23.5	0.96	0.8	15	0.01301	0.003	0.72
1440	7	23.5	0.96	0.8	15	0.01301	0.001	0.72

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.342	25.149	23.81	92.10	19.9	69.7
40	0.425	1.344	36.421	35.08	181.39	29.4	40.3
60	0.250	1.335	24.331	23.00	239.93	19.3	21.1
100	0.150	1.339	15.782	14.44	276.70	12.1	9.0
140	0.105	1.348	5.274	3.93	286.69	3.3	5.7
200	0.075	1.333	3.694	2.36	292.70	2.0	3.7
230	0.063	1.336	2.100	0.76	294.64	0.6	3.1
			Sum	103.37	230 Minus	3.70	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: BL-CS-EC04-050213 (A3E0083-30)

Grain Size Analysis Summary from Sieving and Hydrometer Testing		Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel				4.73
	Retained on No. 4 sieve	4.75	95.27	4.73
Sand				91.53
	Coarse sand, passing No. 4 sieve and retained on No. 10 sieve	2.00	89.64	5.63
	Coarse sand, passing No.10 sieve and retained on No. 20 sieve	0.8500	69.71	19.93
	Medium sand, passing No.20 sieve and retained on No. 40 sieve	0.4250	40.35	29.37
	Medium sand, passing No.40 sieve and retained on No. 60 sieve	0.2500	21.09	19.25
	Medium sand, passing No. 60 sieve and retained on No.100 sieve	0.1500	9	12.09
	Fine sand, passing No. 100 sieve and retained on No.140 sieve	0.1060	5.72	3.29
	Fine sand passing No. 140 sieve and retained on No. 200 sieve	0.0750	3.74	1.98
Silt and Clay (Measurements in the Clay fraction are noted)				3.84
	Silt passing No. 200 sieve and retained on No. 230 sieve	0.0630	3.1	0.64
	Hydrometer Test	0.0505	2.04	1.06
	Hydrometer Test	0.0357	2.04	0
	Hydrometer Test	0.0252	2.07	0
	Hydrometer Test	0.0179	1.29	0.75
	Hydrometer Test	0.0131	1.29	0
	Hydrometer Test	0.0093	1.29	0
	Hydrometer Test	0.0065	1.34	0
	Hydrometer Test	0.0054	0.62	0.67
	Hydrometer Test	Clay	0.0047	0.62
	Hydrometer Test	Clay	0.0033	0.8
	Hydrometer Test	Clay	0.0027	0.72
	Hydrometer Test	Clay	0.0013	0.72

Grain Size Summary	Percent of Total Sample
Gravel	4.7
Sand	91.5
Coarse sand	25.6
Medium sand	60.7
Fine sand	5.3
Silt	3.1
Clay	0.7

Case Narrative for Sample ID: BL-CS-EC04-050213 (A3E0083-30)

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

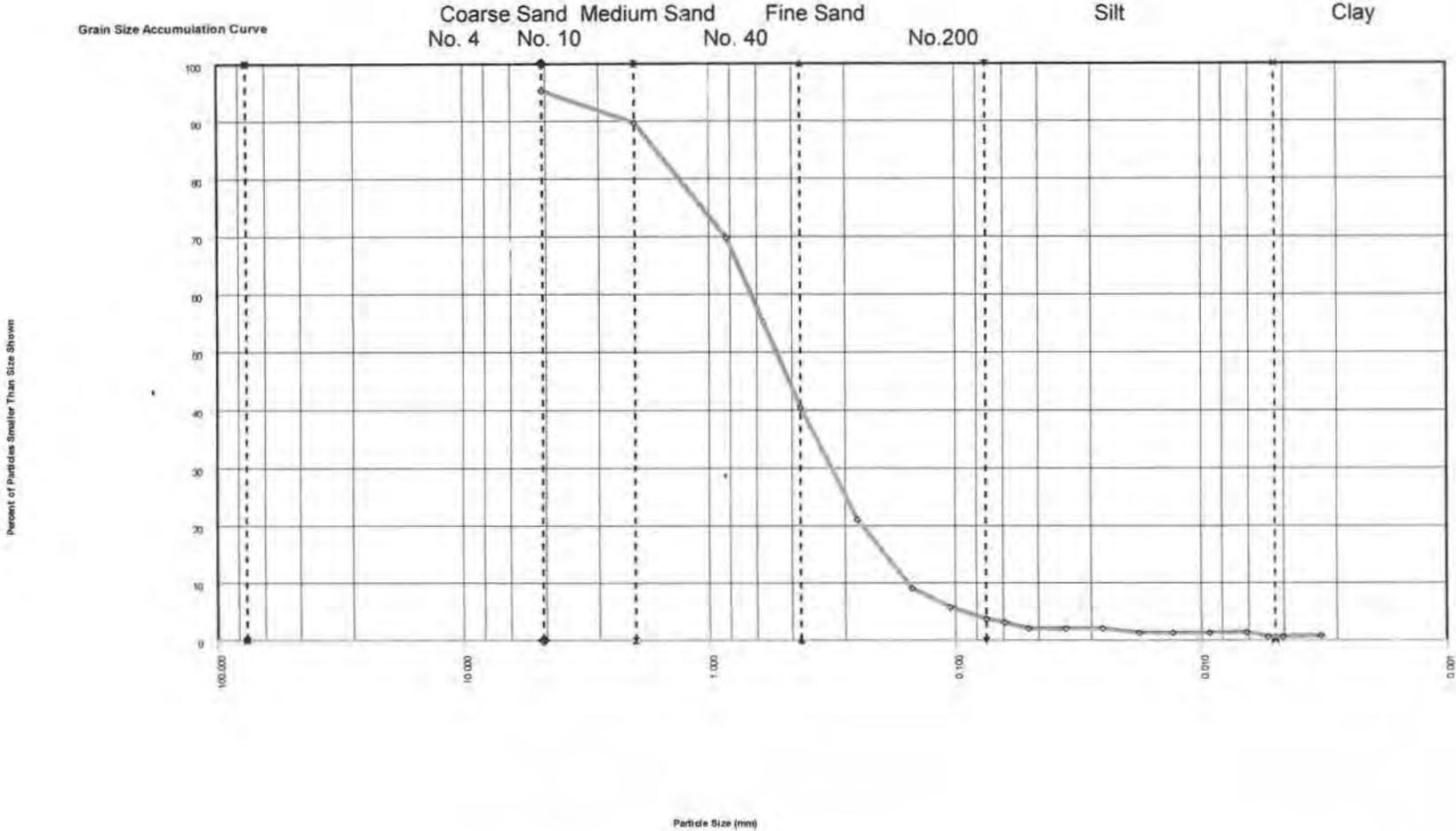
The assumed specific gravity used in the calculations was 2.65.

Trace organic debris present in +10 fraction.



Express 12/31/13

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified



Sample ID: BL-CS-EC04-050213 (A3E0083-30)				
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Sub-angular to sub-rounded	Hard and durable	SAND with trace silt and clay

A3E0083 FINAL 06 16 13 0831 ERRRG Blue Ledge Mine 2013 with Grain Size

Apex Laboratories, LLC

Particle Size Analysis of Soil by ASTM D 422

Sample ID:	A3E0083-32	Client Sample ID:	BL-CS-JC-08-050113	Batch Number:	3050258
Data Entered by:	JSJ	Date:	05/15/13	Data Reviewed by:	JPW
Date:				Date:	05/16/13
Sample Description:	Gravelly SAND with trace silt		Max Particle Size:	Gravel	
Particle Shape:	Angular to sub-rounded		Hardness	Hard and durable	

Whole Sample	Tare	Air Dry + Tare	Air Dry	Moisture	Dry Wt.
	4.721	304.755	300.03	0.56	298.3

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Wt. Retained	% Retained	% Passing
4	4.75	6.291	100.294	94.00	94.00	31.5	68.5
10	2.00	6.241	80.317	74.08	168.08	24.8	43.7
Pan		4.750	135.984	131.23	299.31	43.7	

Hygroscopic Moisture Correction

	Hygroscopic Correction Factor	Oven Sample	Pan No.	Tare	Air Dry + Tare	Oven Dry + Tare	Moisture
	0.9944		E83-32	1.341	21.106	20.995	0.56

Hydrometer Analysis

Start Date/Time	5/9/2013	14:16	Dispersing Agent	NaPO ₃
Air Dry Sample Wt. for Hydrometer Test (g)	111.290		G _s Correction Factor (a)	1.000
Percent Passing No.10 Sieve	43.7		Specific Gravity (G _s)	2.65
Dry Weight of Soil Tested (g)	110.66		Corrected Dry Weight of Soil Tested (g) (W)	253.45

Elapsed Time (min)	Hydrometer Reading	Temperature (°C)	Corrected Hydrometer Reading [R]	% Finer of Hydrometer Sample	L	K	Particle Diameter (mm)	Percent Passing
1	12	23.1	5.82	2.3	14.2	0.01317	0.050	1.00
2	11	23.1	4.82	1.9	14.3	0.01317	0.035	0.83
4	10	23.1	3.82	1.5	14.5	0.01317	0.025	0.66
8	9	23.1	2.82	1.1	14.7	0.01317	0.018	0.49
15	8	23	1.79	0.7	14.8	0.01317	0.013	0.31
30	7	23	0.79	0.3	15	0.01317	0.009	0.14
60	7	23.3	0.89	0.4	15	0.01317	0.007	0.15
90	7	23.2	0.86	0.3	15	0.01317	0.005	0.15
120	7	23.4	0.92	0.4	15	0.01317	0.005	0.16
240	6.5	23.7	0.53	0.2	15	0.01301	0.003	0.09
360	6.5	23.3	0.39	0.2	15	0.01317	0.003	0.07
1440	6.5	23.7	0.53	0.2	15	0.01301	0.001	0.09

Sieve Analysis of Portion Finer Than No. 10 Sieve

Sieve Number	Opening (mm)	Tare	Dry + Tare	Weight Retained	Cumulative Retained	% Retained	% Passing
20	0.850	1.350	51.282	49.93	226.96	19.7	24.0
40	0.425	1.341	32.550	31.21	263.76	12.3	11.6
60	0.250	1.340	13.388	12.05	277.97	4.8	6.9
100	0.150	1.358	6.877	5.52	284.48	2.2	4.7
140	0.105	1.348	3.723	2.38	287.28	0.9	3.8
200	0.075	1.339	3.473	2.13	289.79	0.8	2.9
230	0.063	1.341	2.317	0.98	290.94	0.4	2.6
			Sum	104.19	230 Minus	6.47	

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified

Sample ID: BL-CS-JC-08-050113 (A3E0083-32)

Grain Size Analysis Summary from Sieving and Hydrometer Testing	Particle Size (mm)	Percent Finer	Total Percent of Sample
Gravel			31.51
Retained on No. 4 sieve	4.75	68.49	31.51
Sand			65.55
Coarse sand, passing No. 4 sieve and retained on No. 10 sieve	2.00	43.66	24.83
Coarse sand, passing No.10 sieve and retained on No. 20 sieve	0.8500	23.96	19.7
Medium sand, passing No.20 sieve and retained on No. 40 sieve	0.4250	11.65	12.31
Medium sand, passing No.40 sieve and retained on No. 60 sieve	0.2500	6.9	4.75
Medium sand, passing No. 60 sieve and retained on No.100 sieve	0.1500	4.72	2.18
Fine sand, passing No. 100 sieve and retained on No.140 sieve	0.1060	3.78	0.94
Fine sand passing No. 140 sieve and retained on No. 200 sieve	0.0750	2.94	0.84
Silt and Clay (Measurements in the Clay fraction are noted)			2.96
Silt passing No. 200 sieve and retained on No. 230 sieve	0.0630	2.55	0.39
Hydrometer Test	0.0496	1	1.55
Hydrometer Test	0.0352	0.83	0.17
Hydrometer Test	0.0251	0.66	0.17
Hydrometer Test	0.0179	0.49	0.17
Hydrometer Test	0.0131	0.31	0.18
Hydrometer Test	0.0093	0.14	0.17
Hydrometer Test	0.0066	0.15	0
Hydrometer Test	0.0054	0.15	0
Hydrometer Test Clay	0.0047	0.16	0
Hydrometer Test Clay	0.0033	0.09	0.04
Hydrometer Test Clay	0.0027	0.07	0.02
Hydrometer Test Clay	0.0013	0.09	0

Grain Size Summary

Grain Size Summary	Percent of Total Sample
Gravel	31.5
Sand	65.6
Coarse sand	44.5
Medium sand	19.2
Fine sand	1.8
Silt	2.8
Clay	0.2

Case Narrative for Sample ID: BL-CS-JC-08-050113 (A3E0083-32)

No difficulty dispersing the fraction passing the No. 10 sieve.

Dispersion device used: Commercial drink mixer operating at least 10,000 rpm for one minute.

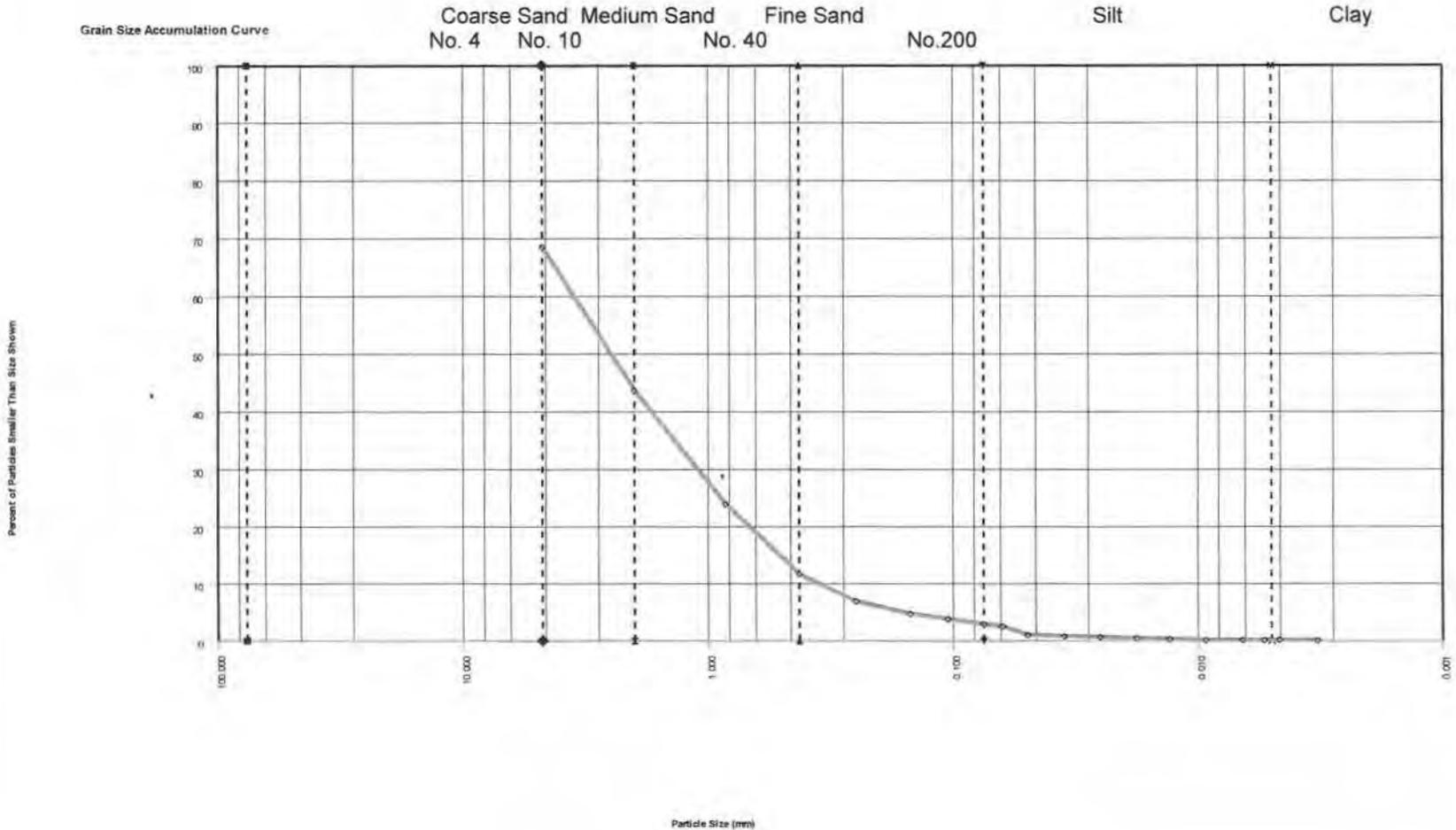
The assumed specific gravity used in the calculations was 2.65.

Trace organic debris present in +4 fraction.



Expires 12/31/13

Apex Laboratories, LLC
Particle Size Analysis of Soil by ASTM D 422 Modified



Sample ID:		BL-CS-JC-08-050113 (A3E0083-32)		
Specific Gravity	MAXIMUM PARTICLE SIZE	GRAVEL & SAND		SOIL DESCRIPTION
		PARTICLE SHAPE	HARDNESS	
2.65	Gravel	Angular to sub-rounded	Hard and durable	Gravelly SAND with trace silt

A3E0083 FINAL 06 16 13 0831 ERRRG Blue Ledge Mine 2013 with Grain Size

Appendix C. Spring 2013 Biannual Monitoring Field Notes



DAILY FIELD ACTIVITY LOG

Prepared by: Annica Nord / Kim Jones Client: VSES
 Day: 5/1/13 Date: 5/1/13
 Project Name: Blueledge Project No.: 2010-084
 Weather: Sunny Page: 1 of 3
 Site Visitors: none

Description of Field Activities:

720 Kim Jones + Annica Nord arrive on site. Conduct health & safety meeting. Drive up road on site. Walk to basin 3 and view of WRP 3

957 PH of water above basin 3 = 5.0. Tree is located on SE end of water in basin. Only 15% sediment on rocks collect sediment sample ~~FX3-3B-050130501~~
 BL-TB-03-050113 PH below basin = 5.3 PH measured using pH strips

1045 Measure pH above 2B = pH = 5.0. No water flowing below basin. Collect sediment sample BL-TB-2B-050113. Basin is 10% full
 Orange rust color stained soil in 2 separate locations on the miners trail parking area. Area appeared damp when surrounding soil was dry.

1113 No water in pH basin 2A. No pH measured. Sediment sample BL-TB-2A-050113 collected. Only minimal dusting over rocks.

1201 Collect sediment sample BL-TB-1F-050113 in basin 1F. pH above basin 1F = 5.0. pH below EPA sediment basin = 3.9. pH above EPA basin = 2.5.

1219 Collect sediment sample BL-TB-1E-050113 in basin 1E. pH ~~below~~^{above} basin 1E = 4.7

1231 Above basin 1D pH = 5.0. Collect sediment sample BL-TB-1D-050113 from sediment basin 1D

1243 pH above basin 1C pH = 5.0. Collect sediment sample BL-TB-1C-050113 from sediment basin 1C.

Signed: [Signature] Date: 5/1/13



DAILY FIELD ACTIVITY LOG

Prepared by:	Annica Nord + Kim Jones	Client:	USFS
Day:	5/1/13 Wednesday	Date:	5/1/13
Project Name:	Blue Ledge	Project No.:	2010-087
Weather:	Sunny	Page:	2 of 3
Site Visitors:	None		

Description of Field Activities:

1255 pH measured above treatment sediment basin 1B is 5.0. Collect sediment sample BL-TB-1B-050113.

1308 pH measured above sediment basin 1A is 5.0. Collect sediment sample BL-TB-1A-050113 from sediment basin 1A.

1343 measurements of surface water at JC-10

DO DO = 11.49 mg/L	temp = 5.93 °C
pH = 7.24	uS/cm = 46
pH _{mV} = -33.3	µS/cm = 29
ORP = 102.4	%DO = 91.0
-0.9 = NTU	

Collect sample for surface water + MS/MSD (BL-SW-JC-10-050113)

Collect sediment sample BL-CS-JC-10-050113

1414 ^{collected} measurements of surface water at JC-09

DO = 11.50 mg/L	6.07 °C
pH = 7.38	41 uS/cm
pH _{mV} = 41.7	26 µS/cm
ORP 83.9	90.4 DO%
NTU -1.6	

Collect surface water sample BL-SW-JC-09-050113

Collect creek sediment sample + duplicate BL-CS-JC-09-050113 and BL-CS-JC-09-050113 DVP. Sample collected 30 yds downstream of usual point because high water access prevented for safety reasons

1431 Collect measurements on surface water at JC-08

DO = 11.68 mg/L	ORP 64.0	42 uS/cm
pH = 7.71	NTU = -0.2	27 µS/cm
pH _{mV} = -58.1	6.17 °C	DO: 91.5 %

Collect water sample + duplicate BL-SW-JC-08-050113 and Creek Sediment BL-CS-JC-08-050113

Signed: Annica Nord Date: 5/1/13



DAILY FIELD ACTIVITY LOG

Prepared by: Annica Nord + Kim Jones Client: USFS
Day: wednesday 5/1/13 Date: 5/1/13
Project Name: Blue Ledge Mine Project No.: 2010-084
Weather: sunny Page: 3 of 3
Site Vistors: none

Description of Field Activities:

Inspect rock stock pile area, south storage area, and repository site, and north storage area. Plants are growing, no evidence of significant erosion (see inspection checklist)
1546 Collect ~~leachate~~ sample from sump. BL-RS-050113. Water is 21 ft and 4 inches from top of sump casing.
Clean up.
1640 AN + KJ off site to drive back to Medford.
No visitors or residents on site today.

Signed: Annica Nord

Date: 5/1/13



DAILY FIELD ACTIVITY LOG

Prepared by: <u>Annica Nord + Kim Jones</u>	Client: <u>USFS</u>
Day: <u>Thursday 5/2/13</u>	Date: <u>5/2/13</u>
Project Name: <u>Blue ledge Mine</u>	Project No.: <u>2010-084</u>
Weather: <u>sunny</u>	Page: <u>1</u> of <u>3</u>
Site Vistors: <u>none</u>	

Description of Field Activities:

820 Kim Jones + Annica Nord on site. Conduct health & safety meeting.

852 Collect readings from surface water at JCO1 and a water sample BL-SW-JCO1-050213 and a creek sediment sample BL-CS-JCO1-050213.

DO = 12.47 mg/L	5.37 °C
DO = 36.9 ch	81 µS/cm
7.66 pH	50 µS/cm
pHmV = -50.0	95.7 DO%
ORP = 81.0	
NTU = 909	

918 Collect surface water readings at JE EC-06.

DO = 12.92 mg/L	5.72 °C
DOch = 36.9	82 µS/cm
pH = 7.26	52 µS/cm
pHmV = -35.5	DO = 97.7 %
ORP = 97.6	
NTU = -0.3	

Collect surface water sample BL-SW-EC06-050213 and creek sediment sample BL-CS-EC06-050213

930 Meet Ron James at 12620

938 Begin purging irrigation well.

941 Collect water sample BL-DW-12620-050213 from the irrigation well.

DO = 9.21 mg/L	ORP = 111.1	271 µS/cm
DO 38.0 ch	NTU = 27.8	DO = 49.5 %
pH = 6.86	11.14 °C	
pHmV = -15.2	368 µS/cm	

Signed: [Signature]

Date: 5/2/13



DAILY FIELD ACTIVITY LOG

Prepared by:	<u>Annica Nord & Kim Jones</u>	Client:	<u>USFS</u>
Day:	<u>Thursday 5/2/13</u>	Date:	<u>5/2/13</u>
Project Name:	<u>Blue Ledge Mine</u>	Project No.:	<u>2010-084</u>
Weather:	<u>Sunny</u>	Page:	<u>2</u> of <u>3</u>
Site Visitors:	<u>none</u>		

Description of Field Activities:

920 Begin flushing drinking water hose.

954 Collected sample BL-DW-12620-050213

~~40.0~~ DO = 9.11 mg/L

10.77 °C

DO = 36.9 ch

488 µs/cm

pH = 7.11

355 µs/cm

pHmV = -27.7

DO = 35.4 %

ORP = 95.5

NTU = 54.1

Ron James requests that we have a better notification system since no one except him & Luke knew of the sampling event today. Bob had no news of us coming.

~~1028 Collected drinking~~ Meet with Bob. He takes us to Johan's house who is out of town.

1028 After running the water for 5 minutes, collect sample from kitchen faucet & for MS/MSD:

DO = 11.52 mg/L

11.42 °C

DO = 38.0 ch

455 µs/cm

pH = 7.28

337 µs/cm

pHmV = -37.1

DO = 39.2 %

ORP = 84.7

NTU = 39.2

1037 Collected water sample from Luke's overflow since he is not home & duplicate: BL-DW-17607-050213 & BL-DW-17607-050213 DUP

DO = 11.79 mg/L

ORP = 79.3

404 µs/cm

DO = 41.0 ch

NTU = 27.7

289 µs/cm

pH = 7.59

10.04 °C

DO = 105.7 %

pHmV = -54.1

Signed: [Signature]

Date: 5/2/13

The overflow is the overflow from his drinking water well.



DAILY FIELD ACTIVITY LOG

Prepared by:	<u>Annica Nord / Kim Jones</u>	Client:	<u>VEFS</u>
Day:	<u>Thursday 5/2/13</u>	Date:	<u>5/2/13</u>
Project Name:	<u>Blue Ledge Mine</u>	Project No.:	<u>2010-084</u>
Weather:	<u>Sunny</u>	Page:	<u>3</u> of <u>3</u>
Site Visitors:	<u>none</u>		

Description of Field Activities:

1050 Collect sample at Bridgetts house (461) from faucet outside: BL-DW-461-050213 after purging for 3 minutes

DO = 10.31 mg/L	11.80 °C
DO = 40.0 ch	392 µs/cm ²
pH = 7.32	293 µs/cm
pHmV = -39.8	DO = 77.4 %
ORP = 94.2	
NTU = 60.0 60.0	

1116 Collected surface water sample BL-SW-EC04-050213 and creek sample BL-CS-EC04-050213 from EC-04

DO = 13.43 mg/L	6.42 °C
DO = 39.0 ch	83 µs/cm ²
pH = 8.00	53 µs/cm
pHmV = -72.0	DO = 98.0 %
ORP = 54.6	
NTU = 0.8	

1200 Kim Jones + Annica Nord off site.

Signed:  Date: 5/2/13



12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: <u>ERRG</u>	Project Mgr: <u>Brian Wetzeaton</u>	Project Name: <u>Blue Ledge Mine</u>	Project # <u>2010-084</u>
Address: <u>4585 Pacheco Blvd # 200</u>		Phone: <u>(925) 969-0750</u>	Fax: <u>(925) 969-0751</u>
Email: <u>brian.wetzeaton@eirg.com</u>			

Sampled by: <u>Annica Nord / Kim Jones</u>	ANALYSIS REQUEST
--	-------------------------

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-DX	NWTPH-GX	8260 VOC	8260 RBDM VOCs	8260 BTEX	8270 SVOC	8270 SIM PAHs	8082 PCBs	600 TIO	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Ti, V, Zn	TOTAL DISS/ TCLP	1200- COLS	1200-Z PH 9040E	% moisture	Particle Size	ASTM D422M	alkalinity	SM 2320 B	PARANESS	SM 2340 B	Sulfate	300	TDS	SM 2340C	TSS	SM 2340D				
																																			OR	WA		
1	BL-TB-03-050113	5/1/13	957	soil	3																																	
2	BL-TB-2B-050113		1045		3																																	
3	BL-TB-2A-050113		1113		2																																	
4	BL-TB-1F-050113		1201		3																																	
5	BL-TB-1E-050113		1219		3																																	
6	BL-TB-1D-050113		1231		3																																	
7	BL-TB-1C-050113		1243		3																																	
8	BL-TB-1B-050113		1255		3																																	
9	BL-TB-1A-050113		1308		3																																	
10	BL-SW-JC-10-050113		1343		6																																	

Normal Turn Around Time (TAT) = 7-10 Business Days YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	SPECIAL INSTRUCTIONS: <u>please composite BL-TB-2A and BL-TB-2B into one sample</u> <u>please perform MS/MSD on BL-CS-JC01-050213, BL-SW-JC-10-050113, and BL-DW-541-050213</u> <u>please composite BL-TB-1A through BL-TB-1F into one sample</u> please send sample results to <u>annica.nord@eirg.com</u>
TAT Requested (circle) 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: _____	
SAMPLES ARE HELD FOR 30 DAYS	

RELINQUISHED BY: <u>Annica Nord</u> Signature: _____ Date: <u>5/2/13</u> Printed Name: <u>Annica Nord</u> Time: <u>17:00</u>	RECEIVED BY: _____ Signature: _____ Date: _____ Printed Name: _____ Time: _____
Company: <u>ERRG</u>	Company: <u>shipped via FedEx</u>

