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*Final*

# 2014 Annual Groundwater Summary Report

Lava Cap Mine Superfund Site  
Nevada County, California

Prepared for  
Contract No. EP-S9-08-04  
U.S. Environmental Protection Agency  
Region 9  
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**CH2MHILL®**

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## 1.0 Introduction

The U.S. Environmental Protection Agency (EPA) is conducting remedial investigations (RI) and remedial actions to address contamination associated with the Lava Cap Mine Site (Site). Groundwater monitoring is conducted regularly at the Site. This report was prepared by CH2M HILL for the U.S. Environmental Protection Agency (EPA) under Task Order 072 (EPA Contract Number EP-S9-08-04). Lava Cap Mine is located southeast of Nevada City, California, as shown on Figure 1-1. This Superfund site was listed on the National Priorities List (NPL) in February 1999. Historically, the Site was a gold and silver mine that operated from the 1860s to 1943. The site wide Lava Cap Mine RI report (EPA, 2001) provides a detailed chronology of mining operations at the Site. There have been no mining activities at the Site since 1943.

The Site encompasses the mine property itself and downgradient areas impacted by historical operations at the Lava Cap Mine. The mine and downgradient areas have been impacted by seepage from the mine adit and contaminated tailings released during mine operations, subsequent winter storms and the 1997 partial collapse of the dam in the mine area. Arsenic is the primary contaminant of concern and risk driver for the Site. This report summarizes an annual groundwater and surface water sampling event conducted in January 2014.

The Lava Cap Mine Site is divided into four operable units (OU). The term “operable unit” is used to define a discrete action that is an incremental step toward a comprehensive remedy. OUs may address certain geographic areas, specific media, initial phases of a remedy, or a set of actions over time. Because of the different issues presented by the various geographic areas and contaminated media at the Site, EPA divided the Site into the following OUs:

- **OU-1** – (Mine Area OU) includes soil and surface-water contamination on the mine property and along Little Clipper Creek (LCC) downstream to Greenhorn Road
- **OU-2** – (Groundwater OU) underlies the entire Superfund site (from the mine property to Little Greenhorn Creek [LGC])
- **OU-3** – (Lost Lake OU) includes soil, sediment, and surface-water contamination in the LCC drainage south of Greenhorn Road to the confluence of Clipper Creek (CC), through the Deposition Area and Lost Lake, and downstream from the Lost Lake Dam to the confluence of CC with LGC (see Figure 1-2). Although some tailings from the Site have been observed downstream in LGC, significant accumulation of tailings is not likely. **OU-4** – (Mine Residences OU) is a subset of OU-1 and specifically addressed remedial actions (RA) at two residences at the mine (the other two residences were demolished as part of the OU-1 RA)

## 2.0 Background

The following sections provide a description and brief history of the Lava Cap Mine Site.

### 2.1 Site Description

The Lava Cap Mine Site includes approximately 30 acres in a rural residential area of the Sierra Nevada foothills. The mine is located approximately 5 miles southeast of Nevada City and 6 miles east of Grass Valley at 14501 Lava Cap Mine Road, Nevada City, California.

The mine property is bordered on all four sides by forest and low-density rural residential areas. Several structures are present at the mine, including the former mill, the former cyanide treatment facility, the former assay building, storage buildings and residences. Other site features include Little Clipper Creek (LCC) that flows southerly along the east side of the mine property, the mine adit that

discharges from the former mine workings, an engineered tailings cap, a rock buttress, as well as several engineered drainage channels that control and direct storm flows on the mine property.

South of Greenhorn Road (OU3 area), LCC merges with CC in the Deposition Area and flows through Lost Lake and over the Lost Lake Dam. Lost Lake Dam was originally constructed in the 1930s as a Lava Cap Mine tailings impoundment. There are approximately 500,000-cubic yards of tailings in the OU3 area behind Lost Lake Dam. A Feasibility Study is currently being conducted for OU3 and a treatment plant is currently being designed for the adit discharge at the mine site (OU1). The adit is the primary source of arsenic loading and elevated arsenic contamination in surface water at the Site.

## 2.2 Summary of Previous Investigations and Findings

Based on results of the Remedial Investigation (EPA, 2001), arsenic was determined to be the dominant carcinogenic constituent present in the surface water, soil/sediments, fish tissue, and groundwater in areas impacted by releases from the Lava Cap Mine Site. As a result, arsenic is the primary risk driver and primary contaminant of concern (COC).

Elevated arsenic concentrations occur in surface soils, sediments, and surface water along the LCC/CC drainage downstream of the mine and across the Site. The locations at which arsenic concentrations in groundwater are elevated tend to coincide with locations at which elevated concentrations of arsenic occur in bedrock, soils, sediments (tailings), and surface water. The concentrations are uniformly high in areas where deposition of tailings-impacted sediment has occurred along the LCC/CC drainage. Arsenic concentrations in LCC surface water fluctuate with stream flow rates throughout the year. Periods of low stream flow (i.e., late summer) correspond to the highest arsenic concentrations in LCC. Conversely, seasonal low arsenic concentrations correlate with periods of high stream flow. This is because during the low-flow periods, the majority of the stream flow in the LCC/CC drainage results from mine adit discharge.

The RI describes an estimated background concentration for arsenic in groundwater at the Site of 18 µg/L (EPA, 2001). This value is likely still valid as it is not expected that background groundwater conditions would have changed substantially. However, there has not been a review of the original calculations since that evaluation and the background dataset is much larger now, so it is likely the number would be different than 18 µg/L. The arsenic drinking water maximum contaminant level (MCL) of 10 µg/L has been used at the Site as a means of evaluating arsenic concentrations in surface water. Historical groundwater and surface water data are provided on a compact disk (CD) included as Appendix C of this report. This excel-based table allows for searching and comparison to previous sampling events. For a more detailed background discussion, results, summary of findings, and planned future activities, please refer to EPA website at the following link:

<http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dec8ba3252368428825742600743733/7f29f3b3740158ca88257007005e944f!OpenDocument>

As part of an interim OU2 remedial action, the EPA completed the installation of a water supply pipeline that provides potable water to the affected properties on the mine site and along Tensy Lane. The source of the potable water is from Nevada Irrigation District (NID). The NID pipeline is currently fully functional.

## 3.0 2014 Groundwater Monitoring and Sampling

The 2014 groundwater monitoring and sampling event occurred from January 20<sup>th</sup> through 23<sup>rd</sup>, 2014. Samples were collected for total arsenic analysis (EPA Method 200.8) from monitoring wells, residential wells, and surface water locations across the Site. This event included the first sampling of two new monitoring wells (5MS and 5MD) that were installed in June 2013 as a shallow and deep well pair. This new well pair is located approximately 375 feet south of the tailings rock buttress on the Mine Site Area. The requirement for installation of these two new monitoring wells downgradient of the tailings pile is included in the Monitoring Requirements subsection of the selected remedy for the mine area (Section 12.2.2) in the Mine Area Operable Unit (OU1) ROD from September 2004 (USEPA, 2004).

The sections below describe the field activities that occurred during the monitoring event.

Sampling locations and the corresponding arsenic concentrations in groundwater and surface water are presented in Figures 4-1 through 4-3. Figure 4-1 shows the sampling location and results in the Reference Areas/Source Area/and Mine Area. Reference Areas are upstream or upgradient of areas potentially impacted by the Lava Cap Mine. The Source Area and Mine Area are located at the mine, in the mine vicinity and immediately down-gradient of the mine as shown in Figure 4-1. Figure 4-2 shows the sampling locations and results in the area between the mine and the Deposition Area; an area referred to as Little Clipper Creek downgradient of the mine. Figure 4-3 shows the sampling locations and results in the Deposition/Lost Lake Area.

### 3.1 Field Activities

The field activities included collection of samples for arsenic analysis from 11 monitoring wells, 17 residential wells, two post-reverse osmosis treatment units and two surface water locations. Unless noted below, sampling activities were conducted consistent with the approved OU2 Field Sampling Plan (CH2M HILL, 2005).

#### 3.1.1 Water Quality Data Collection

Prior to sample collection, water quality data (pH, electrical conductance, temperature, oxidation-reduction potential, turbidity, and dissolved oxygen) were measured and recorded. Table 1 presents the water quality parameters measured in the field prior to sample collection. The field forms containing the field data and purge information are provided in Appendix A. The wells were purged until the field parameters stabilized to within specified criteria for three successive readings. If parameters did not stabilize and a reason was evident, samples were collected and deviations noted on the field forms. Consistent with the approved SAP, the specified criteria for stabilized readings are:

- 0.1 pH units
- 3 percent for electrical conductance
- 10 millivolts for redox potential
- 10 percent for turbidity and dissolved oxygen

#### 3.1.2 Monitoring Well Sampling

Groundwater samples were collected from monitoring wells using the low-flow, minimal drawdown procedure (also known as the “micro purge” technique) described in *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures* (EPA, 1996). Low-flow, minimal-drawdown sampling techniques minimize sediment disruption in the well and oxygen exchange with the atmosphere. These are

particularly important factors when collecting samples for metals analyses. Using the low-flow technique, each well was purged at a low flow rate (a rate that does not significantly lower the water level within the casing) with a pump placed in the screened interval. At the Lava Cap Mine Site, the goal is to use a pumping rate of less than 0.5 gallons per minute (gpm) with drawdown of less than 0.5 foot during purging. However, modifications are made if necessary for monitoring wells that produce water at very low rates. Figures 4-1 through 4-3 show the locations of monitoring wells at the Site and differentiate between wells that were sampled (indicated by the posted result) and those that were not sampled (indicated by "NS").

At each monitoring well, a portable submersible pump was lowered slowly into the well to the middle of the screened interval. Care was taken to minimize both disturbance of solids in the well and excessive mixing of the stagnant water in the casing above the screen.

An electric water-level indicator was used to measure the depth to groundwater in the well. The volume of water extracted was recorded throughout purging whenever field parameters were measured. The samples were collected by filling sample bottles directly from a sampling port in the pump discharge tubing.

### **3.1.3 Residential Well Sampling**

Permission was granted from selected property owners at the Lava Cap Mine Site to access their property and collect groundwater samples from their residential wells. Residents were notified at least 24 hours in advance of activities requiring access to their property.

The residential wells sampled during this event included wells on the mine property, along LCC, and around and adjacent to the Deposition Area/Lost Lake Area. Figures 4-1 through 4-3 show the locations of residential wells in the Site vicinity that have been sampled historically and indicate which wells were sampled (indicated by the posted result) and or not sampled (indicated by "NS") during the January 2014 event. These samples were collected from as close to the wellhead as possible. If a spigot was not available at the wellhead or the pressure tank, an outdoor water faucet was used for sampling. It is assumed that all of the residential wells sampled were in a normal operating status and substantial volumes had been pumped from the well relatively recently. Thus, there was no attempt to estimate and pump three well volumes prior to sampling.

Typically, the well pump was run for 10 minutes (unless the well had a history of running dry) and field parameters measured. After parameter measurement, the groundwater sample bottles were filled directly from the spigot. If possible, the depth to groundwater was measured and recorded prior to sampling the residential wells.

### **3.1.4 Surface Water Sampling**

Surface water samples were collected from two stream locations (location 14B and 15A). Figures 4-1 through 4-3 show additional surface water locations at the Site that have been sampled historically. Samples were collected directly into the sample bottles. Field parameter readings were recorded from the surface water body prior to sample collection.

## **3.2 Laboratory Analysis**

Groundwater and surface water samples were submitted under chain of custody procedures to the USA EPA Region 9 Laboratory. Samples were analyzed for arsenic using method 200.8. Results are discussed in the section below and presented in Table 2.

Field quality assurance (QA) samples were collected in the form of field duplicate, field and equipment blanks, and matrix spike/matrix spike duplicate (MS/MSD) samples. Disposable sampling

equipment was used for much of the sampling. However one equipment blank was collected from the non-disposable equipment used (submersible pump and tubing). The blank sample results were used to verify that contamination was not introduced to samples during collection, handling, or shipping. Of the 36 total samples collected, four were field duplicate samples. The field duplicate samples showed excellent correlation to their associated primary samples.

## 4.0 Results

A total of 32 locations were sampled (Figures 4-1 through 4-3) during this event along with four field duplicate samples. Complete laboratory results are provided in Appendix B. As noted in the purge logs, the electrical conductivity meter used during well purging had numerous instances of elevated maximum readings and appears to have been malfunctioning. Although the meter calibrated correctly each morning, it did not operate as expected during the sampling activities and the readings are not consistent with previous events or expected groundwater conditions. The malfunction appeared to be a result of a faulty sensor or programming and no backup meter was available. Even though the electrical conductivity readings are suspect, this field measurement has no impact on the Arsenic results reported from the laboratory. This is because EC is one of six field parameters used in the field to ensure that formation groundwater is being sampled after purging. The other field parameters (pH, temperature, turbidity, DO, and ORP) measured during purging, all stabilized to within specifications prior to sampling, indicating that representative formation groundwater was present and sampling for laboratory analysis could occur.

### 4.1 Mine Area

For the Mine Area (the OU1 and OU4 area), the results showed that the groundwater in the sampled monitoring wells exceed the background level of 18 µg/L in four of the seven MWs. Concentrations of arsenic ranged from 5.1 µg/L at 5KS to 1,400 µg/L at 5LS. These results are consistent with the values and ranges reported for the 2012 sampling event (CH2MHILL, 2013), but continue to be higher than historical events (e.g. August 2010 result of 510 µg/L). The presence of suspended or colloidal solids, as indicated by elevated turbidity readings in sample 5KL in particular could have contributed to higher arsenic concentrations. The two newly installed wells, 5MD and 5MS, had results of 22 µg/L and 16 µg/L, respectively. These results indicate that there does not appear to be significant arsenic contamination migrating away from the tailings cap area in the shallow bedrock. One monitoring well in the Mine Area (MW 1B), could not be sampled because the water level was deeper than the equipment could reach. Future sampling events will ensure that equipment will be available to reach the deeper water levels present in this well. This well is located upgradient of the Mine Area and for the past 12 years has typically had arsenic concentrations at or below the background concentration of 18 µg/L.

### 4.2 Deposition Area

Four monitoring wells were sampled in the Deposition Area (OU-3 area). Samples from two of the wells (13Q and 13R) had elevated arsenic concentrations of 170 µg/L and 48,000 µg/L, respectively. The detection of 48,000 µg/L is approximately 60 times higher than the previous result of 800 µg/L from the 2012 event (CH2MHILL, 2013). Both wells are screened near the bottom of the thick sequence of tailings present in the Deposition Area. Note that at the time of sampling, the field crew reported that black sands were present during the initial purging as well as elevated turbidity readings throughout purging of MW13R (see purge log, Appendix A). The pump was likely placed too deeply into the well and caused the fine-grained sediments (silts and sands) that typically accumulate in the bottom of wells, to be mobilized and become included in the sample.

Wells 13S and 13T had groundwater results of 6.8 and 17 µg/L, respectively. These concentrations are below the site background level of 18 µg/L and are consistent with historical results.

Two surface water samples were collected along LCC and CC in the Deposition Area. Results show that arsenic is present at concentration of 83 µg/L at location 14B and 58 µg/L at location 15A. These results are consistent and within the range of previous sample events.

### 4.3 Residential Wells

A total of 17 residential well samples were collected (two of which were post-reverse osmosis treatment system samples) (Figures 4-1 through 4-3). Nine additional locations (10H, 11AV, 11AV-Treat, 11AD, 11AE, 11AF, 11AK, 11AN and 11AZ), were planned for sampling, but could not be sampled because either permission was not received from the home owners (6 locations), the well serves as irrigation and a sampling spigot was not accessible (1 location [11AN]), or there was no electricity to power the pump (2 locations [10G and 11AZ]).

The results indicate that one of the three groundwater samples from the Tensy Lane Area (part of OU-1) was above both the arsenic maximum contaminant level (MCL) of 10 µg/L and the site background level of 18 µg/L. Residential Well 11AL had the highest concentration of 26 µg/L. However, the samples collected after the reverse osmosis treatment systems associated with this residential well (11AL-Treat1 and 11AL-Treat2) had concentrations of 1.1 µg/L and 1.7 µg/L, respectively. These results confirm the effectiveness of the reverse osmosis treatment units to reduce arsenic concentrations. Two residential wells on the mine property were sampled (10G and 10N) and arsenic was detected above the MCL and site background level at concentrations of 29 µg/L and 86 µg/L, respectively. A former under-sink reverse osmosis unit, associated with well 10G, had been removed by the property owner.

The groundwater samples collected from residential wells within the Greenhorn Road/Lost Lake/Deposition Area (OU3) downgradient of the Mine Area all were below the arsenic MCL. Concentrations ranged from non-detect (ND) up to 0.86 µg/L. These low concentrations are consistent with previous sampling events.

## 5.0 Summary and Conclusions

Concentrations of arsenic in groundwater and surface water are generally consistent with results from previous sampling events, with the exception of the 48,000 µg/L reported from 13R. Elevated arsenic detections above background concentrations are present within the Mine Area as well as select downgradient locations along Tensy Lane and in the Deposition Area where tailings are present. For the Tensy Lane residential wells sampled, the results show that the EPA-maintained reverse osmosis systems are effectively reducing arsenic concentrations to well below the MCL. The new potable water supply line replaces the need for continued use and maintenance of the reverse osmosis treatment units. The arsenic concentrations in residential wells south of Greenhorn Road in the OU3 area of the Mine Area were ND or below the MCL when detected.

The region has experienced unusually dry conditions, not typical of the winter season, with low seasonal rainfall totals. These unusual drought-like conditions, coupled with the presence of black sands and elevated turbidity readings in the 13R well, may have been contributing factors to the remarkably high concentration reported at 13R of 48,000 µg/L.

Based on the results, it is recommended that annual sampling and reporting be continued so that groundwater and surface water can be monitored while feasibility study, remedial design and remedial action activities continue. With the installation of the NID potable water pipeline to serve

the mine site and Tensy Lane residents, there is no longer a need for future sampling of residential water at EPA-provided under-sink RO treatment units. However, the wells should still be sampled to further assist in overall monitoring of site-wide groundwater conditions.

## 6.0 References

CH2MHILL. 2013. *Final. 2012 Annual Groundwater Sampling Report, Lava Cap Mine Superfund Site*. Nevada County, California. Prepared for the USEPA. April.

CH2MHILL. 2005. *Final Field Sampling Plan for the Operable Unit 2 Remedial Investigation/Feasibility Study, Lava Cap Mine Superfund Site*. Prepared for the USEPA. March.

U.S. Environmental Protection Agency (EPA). 2004. *Record of Decision, Lava Cap Mine Superfund Site, Mine Area Operable Unit (OU1), Nevada City, California*. September.

U.S. Environmental Protection Agency (EPA). 2001. *Public Release Draft Remedial Investigation Report for the Lava Cap Mine Superfund Site, Nevada County, California*. November.

U.S. Environmental Protection Agency (EPA). 1996. *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*. EPA Ground Water Issue, EPA/540/S-95/504. April.

**Tables**

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**TABLE 1**

2014 Water Quality Data

Lava Cap Mine Superfund Site, Nevada County, California

Type/Location	Sample ID	Parcel	pH	Conductivity	Temperature	Turbidity	DO	ORP
<b>Monitoring Wells</b>			<b>pH Units</b>	<b>µS/cm</b>	<b>°C</b>	<b>NTU</b>	<b>mg/L</b>	<b>mV</b>
<b>Mine Site Area</b>	5KD	39-160-29	7.8	999	11.26	131	0.54	-210
	5KS	39-160-29	6.46	999	13.39	0.1	0.42	-38
	5LD	39-160-29	7.73	999	11.12	4.7	0.15	-161
	5LS	39-160-29	6.44	999	13.17	283	2.07	109
	5MD	39-160-28	6.45	999	10.72	19.9	0.3	-97
	5MS	39-160-28	7.89	999	10.66	4.7	0.26	-123
	1R	39-160-16	6.18	999	12.47	20.5	0.49	-49
	1B	39-150-24	NS	NS	NS	NS	NS	NS
<b>Deposition Area</b>								
<b>Deposition Area</b>	13Q	39-221-69	7.22	999	8.97	0	0.3	-142
	13R	39-221-70	7.51	999	9.2	421	0.15	-164
	13S	39-221-69	6.51	999	9.19	0	0.32	-36
	13T	39-221-70	7.6	999	9.19	0	0.51	-155
<b>Surface Water</b>								
<b>Deposition Area</b>	14B	39-221-70	6.81	999	4.5	295	0	-15
	15A	39-221-15	7.38	999	3.48	16.6	11.17	-51
<b>Residential Wells</b>								
<b>Mine Site Area</b>	10G	39-160-16	7.45	999	11.86	513	0.24	60
	10N	39-160-25	7.28	999	11.41	O/R	0.57	-6.3
<b>Tensy Lane Area</b>								
<b>Tensy Lane Area</b>	11AL	39-170-77	6.69	999	10.31	0	0.21	-45
	11AL-TREAT1	39-170-77	6.16	183	11.88	12	3.81	184
	11AL-TREAT2	39-170-77	6.3	999	13.16	155	9.42	181
	11AS	39-170-66	6.81	999	8.29	902	1.79	-32
	11AU	39-170-66	6.17	991	11.39	1.1	3.53	152
<b>Greenhorn/Deposition Area</b>								
<b>Greenhorn/Deposition Area</b>	11AA	39-230-45	8.07	999	5.12	46	3.93	10
	11AB	39-230-58	5.96	999	10.22	0	0.2	12
	11AC	39-230-51	6.69	999	10.15	0	1.74	-31
	11AG	39-230-61	6.69	358	11.07	0	10.84	248
	11AH	39-221-17	5.29	303	7.71	136	5.01	252
	11AI	39-221-69	5.4	345	11.28	3.6	2.66	203
	11AJ	39-221-13	7	999	8	0	3.86	143
	11AM	39-221-63	7.04	999	10	0	7.1	128
	11AO	39-221-15	7.1	999	11.03	0	0.27	-33
	11AP	39-221-23	6.56	900	10.7	285	0.01	-42
	11AQ	39-221-67	6.19	683	12.15	O/R	0.14	15
	11AY	39-170-75	6.72	999	9.69	40	0.02	-7

Notes:

NS	Not Sampled
µS/cm	Microseimens per centimeter
°C	Degrees Celcius
NTU	Nephelometric turbidity units
mg/L	Milligrams per liter
mV	Millivolts
O/R	Over Range

*The electrical conductivity meter exhibited an unknown performance issue during its use that resulted in the majority of results being elevated and not consistent with historical results or expected GW conditions.*

**TABLE 2**

2014 Analytical Results

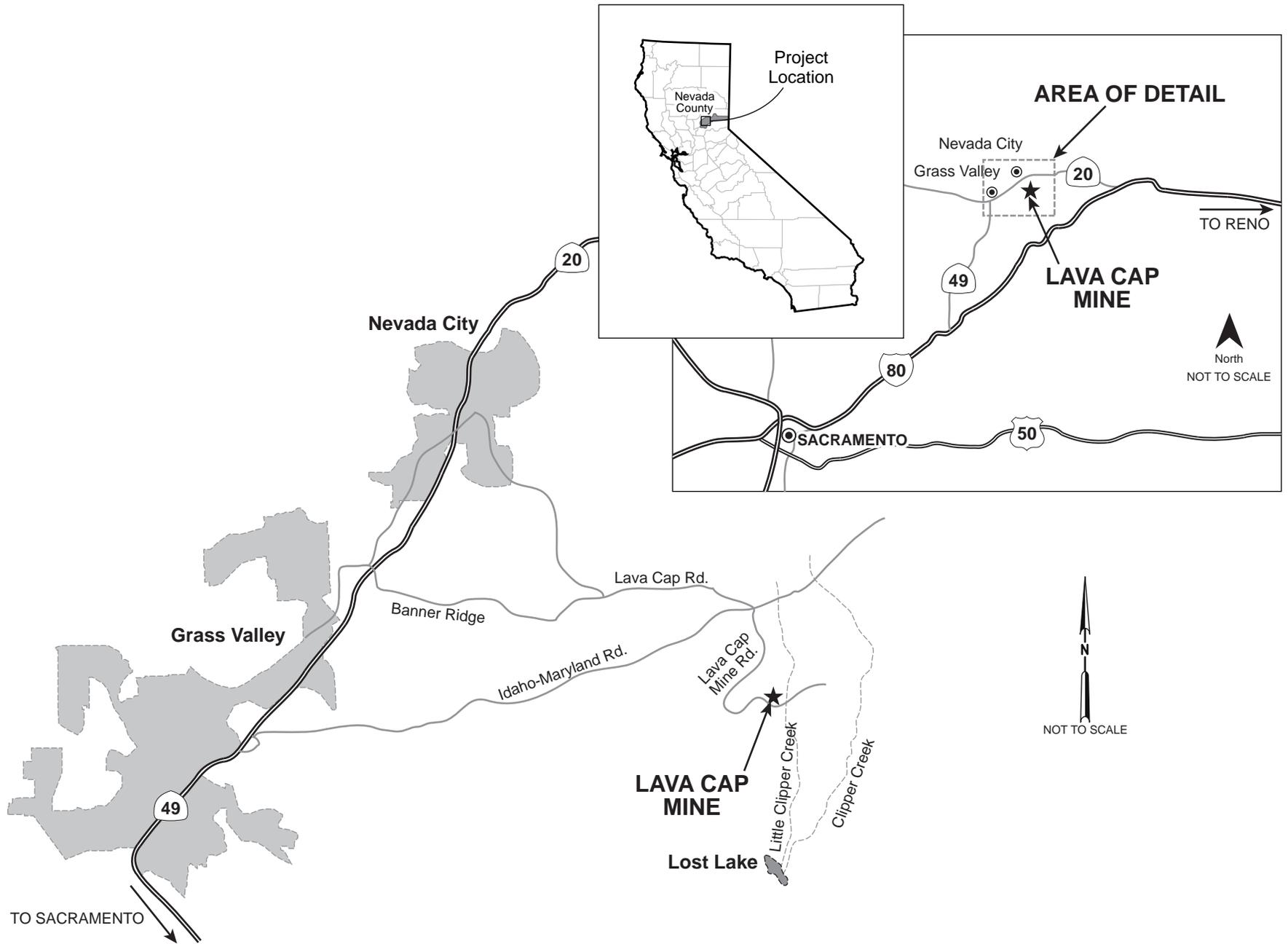
Lava Cap Mine Superfund Site, Nevada County, California

Type/Location	Sample ID	Parcel	Type	Note	Result (ug/L)
<b><u>Monitoring Wells</u></b>					
<b><u>Mine Site Area</u></b>	5KD	39-160-29	MW		41
	5KS	39-160-29	MW		5.1
	5KS	39-160-29	MW	Field Duplicate	5.1
	5LD	39-160-29	MW		25
	5LS	39-160-29	MW		1,400
	5MD	39-160-29	MW		22
	5MS	39-160-28	MW		16
	1R	39-160-16	MW		17
1B	39-150-24	MW		NS	
<b><u>Deposition Area</u></b>					
<b><u>Deposition Area</u></b>	13Q	39-221-69	MW		170
	13R	39-221-70	MW		48,000
	13S	39-221-69	MW		6.8
	13T	39-221-70	MW		15
<b><u>Surface Water</u></b>					
<b><u>Deposition Area</u></b>	14B	39-221-70	Surface Water		83
	15A	39-221-15	Surface Water		58
	15A	39-221-15	Surface Water	Field Duplicate	55
<b><u>Residential Wells</u></b>					
<b><u>Mine Site Area</u></b>	10H	39-160-30	ResWell		NS
	10G	39-160-16	ResWell		29
	10N	39-160-25	ResWell		86
<b><u>Tensy Lane Area</u></b>					
<b><u>Tensy Lane Area</u></b>	11AL	39-170-77	ResWell		26
	11AL-TREAT1	39-170-77	ResWell	after RO unit	1.1
	11AL-TREAT2	39-170-77	ResWell	after RO unit	1.7
	11AS	39-170-66	ResWell		16
	11AS	39-170-66	ResWell	Field Duplicate	17
	11AU	39-170-66	ResWell		2.9
	11AV	39-170-65	ResWell		NS
	11AV-TREAT	39-170-65	ResWell		NS
<b><u>Greenhorn/Deposition Area</u></b>					
<b><u>Greenhorn/Deposition Area</u></b>	11AA	39-230-45	ResWell		0.25 U
	11AB	39-230-58	ResWell		0.86
	11AC	39-230-51	ResWell		0.25 U
	11AD	39-221-22	ResWell		NS
	11AE	39-230-62	ResWell		NS
	11AF	39-221-01	ResWell		NS
	11AG	39-230-61	ResWell		0.25 U
	11AH	39-221-17	ResWell		0.25 U
	11AH	39-221-17	ResWell	Field Duplicate	0.25 U
	11AI	39-221-69	ResWell		0.25 U
	11AJ	39-221-13	ResWell		0.25 U
	11AK	39-170-74	ResWell		NS
	11AM	39-221-63	ResWell		0.34 J
	11AN	39-221-64	ResWell		NS
	11AO	39-221-15	ResWell		0.25 U
	11AP	39-221-23	ResWell		0.54
	11AQ	39-221-66	ResWell		0.31 J
	11AY	39-170-75	ResWell		0.4 J
	11AZ	39-170-75	ResWell		NS

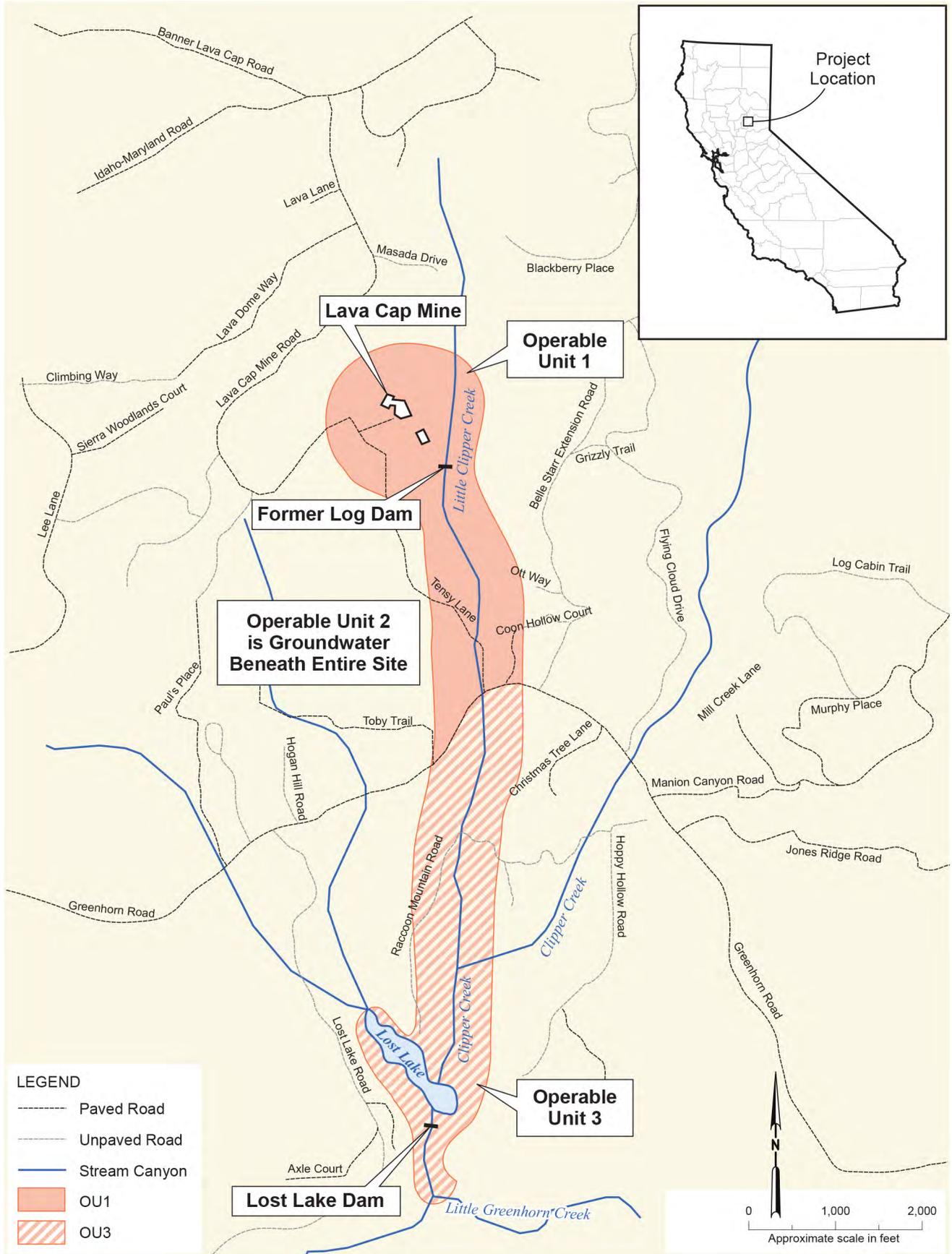
Notes: NS = Not Sampled  
 U = Not Detected  
 J = Estimated Value  
 RO Unit = Reverse Osmosis  
 All units are in µg/L

**Figures**

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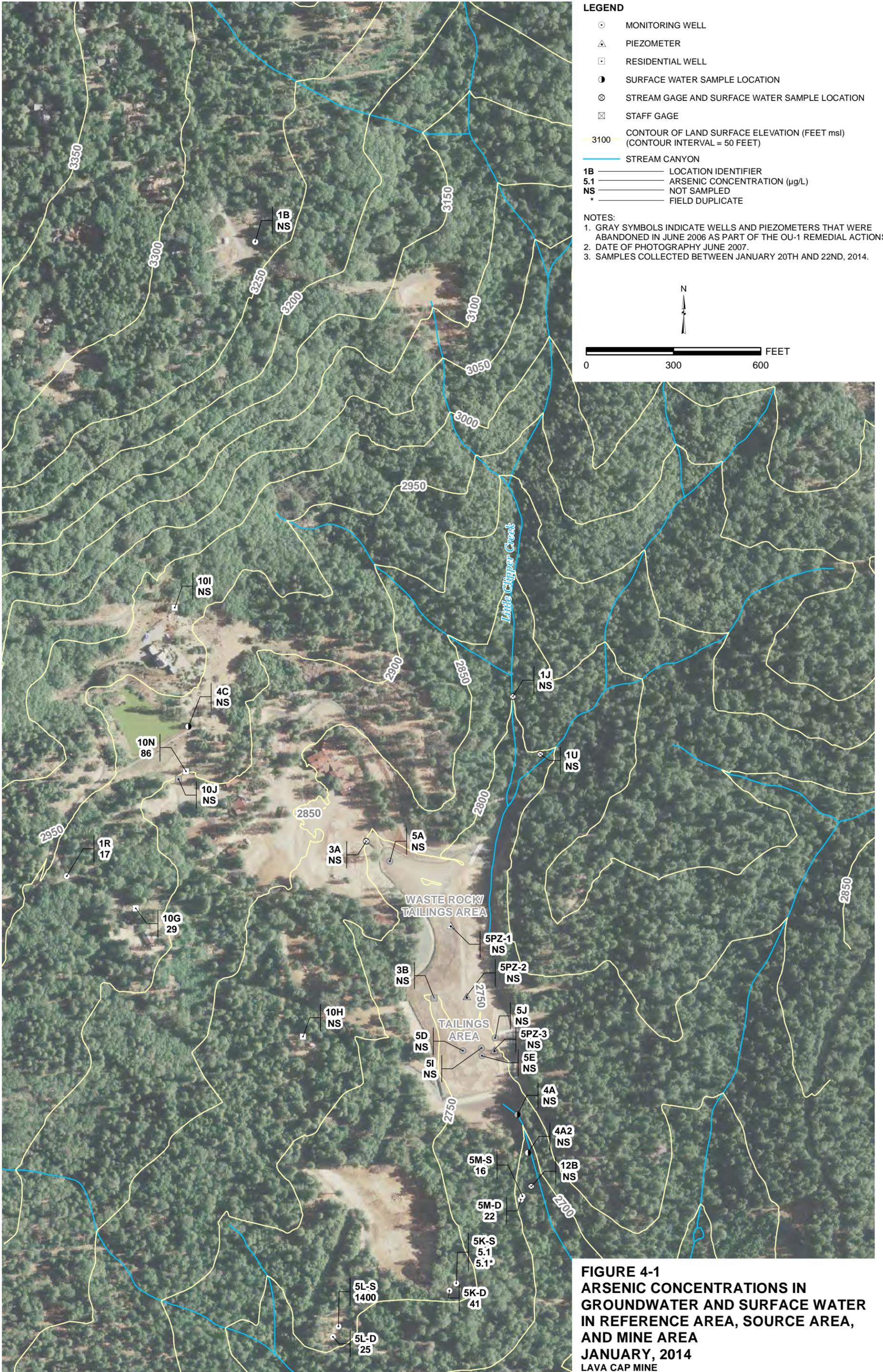


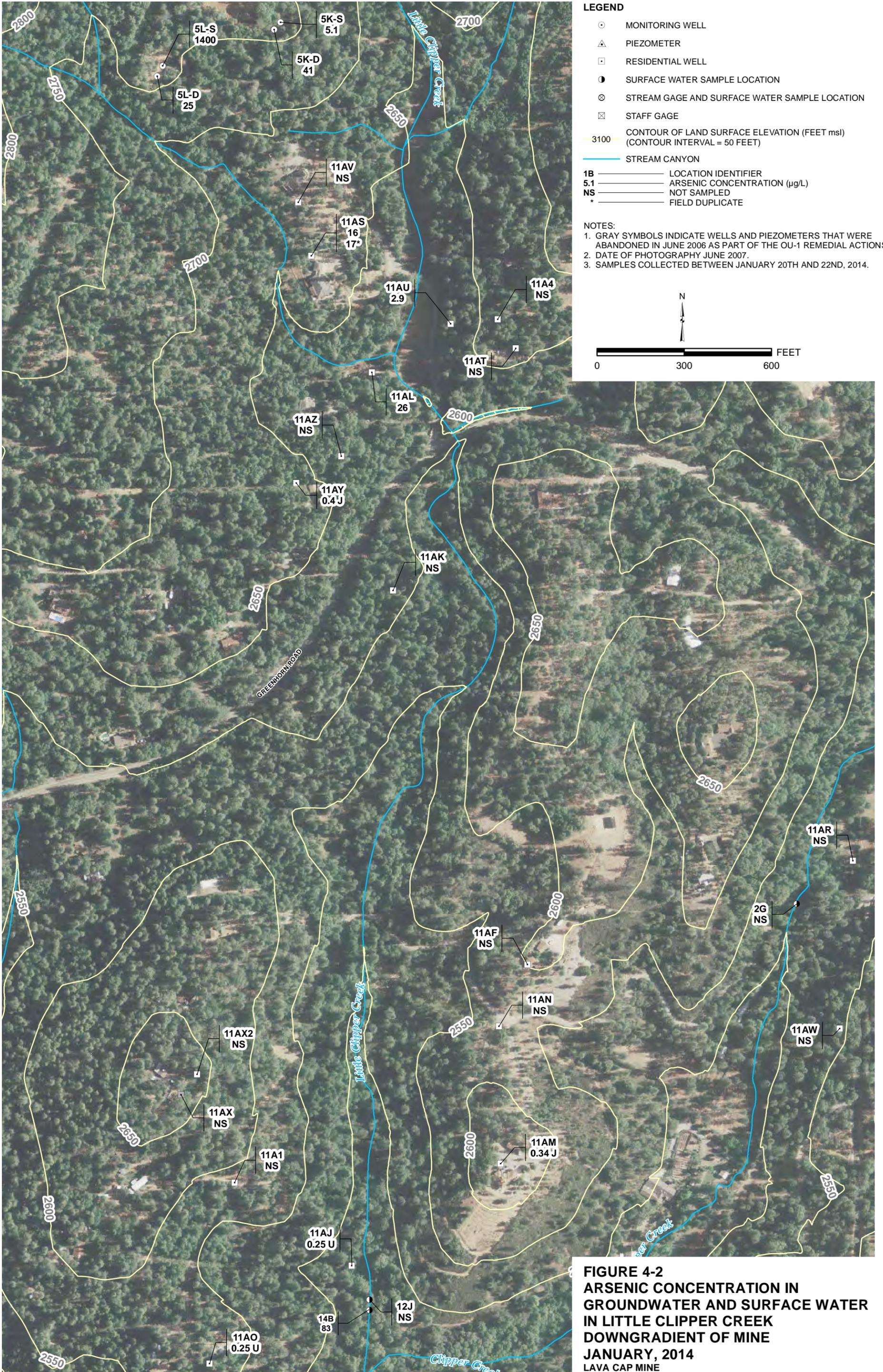
**FIGURE 1-1**  
**LOCATION OF LAVA CAP MINE SITE**  
 LAVA CAP MINE



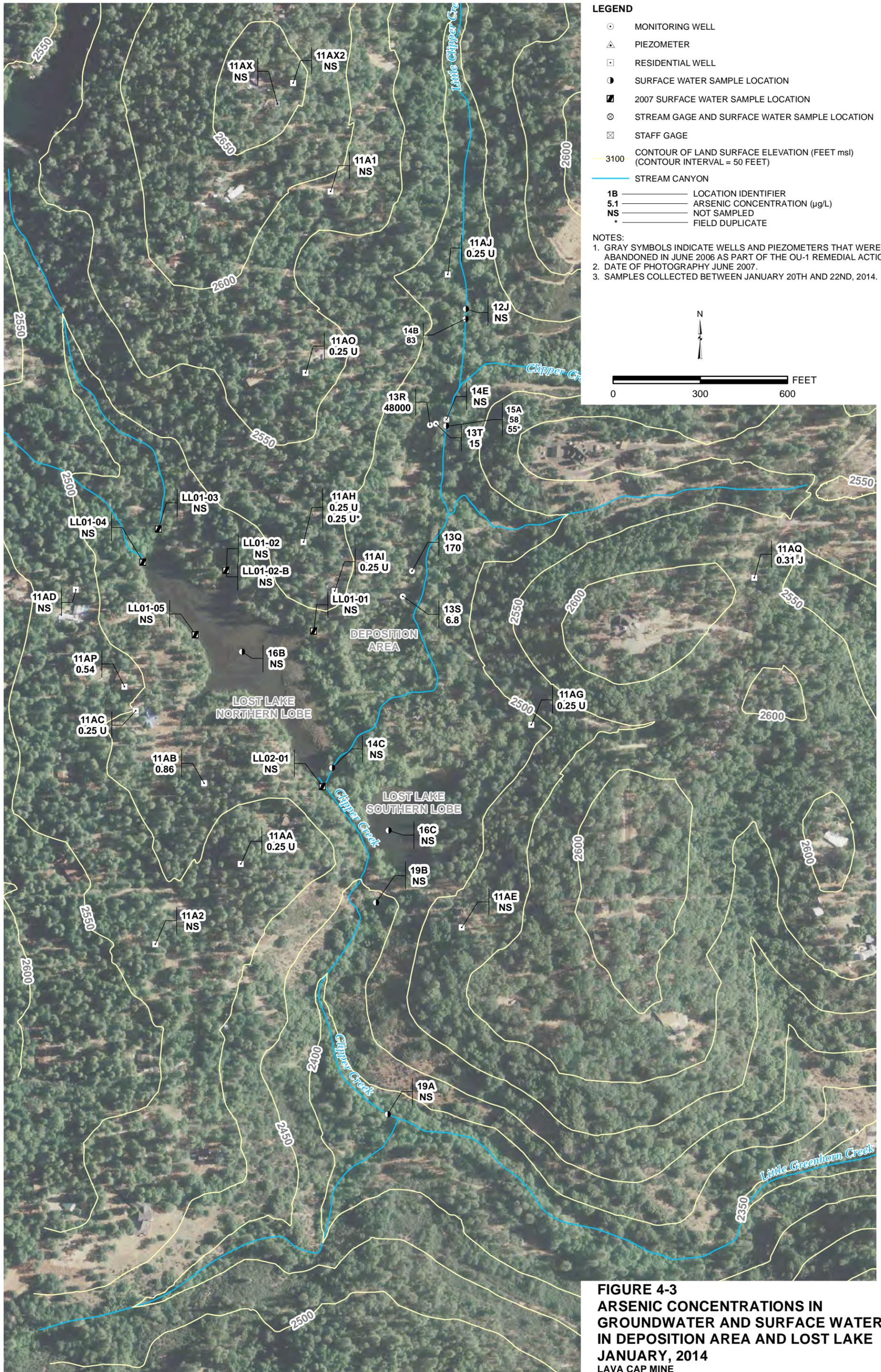
**FIGURE 1-2  
LAVA CAP MINE OPERABLE UNITS**

LAVA CAP MINE





**FIGURE 4-2**  
**ARSENIC CONCENTRATION IN**  
**GROUNDWATER AND SURFACE WATER**  
**IN LITTLE CLIPPER CREEK**  
**DOWNGRADIENT OF MINE**  
**JANUARY, 2014**  
**LAVA CAP MINE**



**Appendix A**  
**Groundwater Purge Logs**

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# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Mine Site MW LOCATION ID 1R  
DATE 01/20/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION (Y) N ALCONOX WASH ✓ DISTILLED RINSE ✓

### SAMPLING INFORMATION

SAMPLE FIELD ID 1R-1Q14

SAMPLE TIME 0955

SAMPLING WATER LEVEL 69.27

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175  
E310.1 HACH  
Other (specify) E200.8

FIELD FILTERED Y (N) if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y (N)

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) CG LP



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Mine Site MW LOCATION ID 5MS

DATE 01/20/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION (Y) N ALCONOX WASH ✓ DISTILLED RINSE ✓

### SAMPLING INFORMATION

SAMPLE FIELD ID 5MS-1Q14

SAMPLE TIME 0851

SAMPLING WATER LEVEL 18.90

### ANALYSIS (circle)

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify)		<u>E200.8</u>			

FIELD FILTERED Y (N) if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y (N)

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) UP/GG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Mine Site MW LOCATION ID 5 MD  
DATE 01/20/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION (Y) N ALCONOX WASH ✓ DISTILLED RINSE ✓

### SAMPLING INFORMATION

SAMPLE FIELD ID SMD-1014

SAMPLE TIME 1434

SAMPLING WATER LEVEL 17.74

### ANALYSIS (circle)

- SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M
- SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175
- E310.1 HACH
- Other (specify) E200.B

FIELD FILTERED Y (N) if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y (N)

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) LP CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Mine Site MW LOCATION ID 5KD

DATE 01/20/14

### FIELD MEASUREMENT/ COLLECTION EQUIPMENT

MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 5KD-1014

SAMPLE TIME 1304

SAMPLING WATER LEVEL 68.97

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175

E310.1 HACH

Other (specify) E200-B

FIELD FILTERED Y  if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

FIELD TEAM (initials) W CG



## GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Mine Site MW LOCATION ID 5KS

DATE 01/20/14

**FIELD MEASUREMENT/  
COLLECTION EQUIPMENT**

MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

**SAMPLING INFORMATION**

SAMPLE FIELD ID 5KS-1014

SAMPLE TIME 73.79 1351

SAMPLING WATER LEVEL 73.79

**ANALYSIS (circle)**

- SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M
- SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175
- E310.1 HACH
- Other (specify) E200-B

FIELD FILTERED Y  if yes, for which analysis —

EQUIPMENT BLANK Y

QA/QC FIELD ID 5KS-1014FD QA/QC TYPE FO

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y  If Yes, specify: —

COMMENTS/FIELD NOTES: —

FIELD TEAM (initials) UP CB



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Mine Site MW LOCATION ID SLD  
DATE 01/20/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION (Y) N ALCONOX WASH ✓ DISTILLED RINSE ✓

### SAMPLING INFORMATION

SAMPLE FIELD ID SLD-1014

SAMPLE TIME 1533

SAMPLING WATER LEVEL 43.33

### ANALYSIS (circle)

- SW9060    SW9056    E160.1    SW8260B    E300.0    E300.0M
- SW6010BF    SW6010B    SW8015-D    SW8015-P    SW6850    RSK-175
- E310.1    HACH
- Other (specify) E200.B

FIELD FILTERED    Y    (N) if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK    Y    (N)

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) VP CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID MW Site NW LOCATION ID SLS

DATE 01/20/14

### FIELD MEASUREMENT/ COLLECTION EQUIPMENT

MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID SLS-1Q14

SAMPLE TIME 1632

SAMPLING WATER LEVEL 52.70

### ANALYSIS (circle)

- SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M
- SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175
- E310.1 HACH
- Other (specify) E200 B

FIELD FILTERED Y  if yes, for which analysis —

EQUIPMENT BLANK Y

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) UP CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Deposition Area LOCATION ID 13Q  
DATE 01/21/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —  
HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 13Q1014

SAMPLE TIME 1005

SAMPLING WATER LEVEL 7.79

### ANALYSIS (circle)

- |                               |         |          |          |        |         |
|-------------------------------|---------|----------|----------|--------|---------|
| SW9060                        | SW9056  | E160.1   | SW8260B  | E300.0 | E300.0M |
| SW6010BF                      | SW6010B | SW8015-D | SW8015-P | SW6850 | RSK-175 |
| E310.1                        | HACH    |          |          |        |         |
| Other (specify) <u>E200-B</u> |         |          |          |        |         |

FIELD FILTERED Y  if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y

QA/QC FIELD ID 13Q-1Q14MS QA/QC TYPE MS

QA/QC FIELD ID 13Q-1Q14SD QA/QC TYPE SD

QA/QC analysis different from original analysis? (circle) Y  If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) LP/LG



## GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Deposition Area LOCATION ID 13R  
 DATE 01/21/14

**FIELD MEASUREMENT/**

**COLLECTION EQUIPMENT** MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

**SAMPLING INFORMATION**

SAMPLE FIELD ID 13R-1614

SAMPLE TIME 1106

SAMPLING WATER LEVEL 637

**ANALYSIS (circle)**

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify) <u>E200-B</u>					

FIELD FILTERED Y  if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

**COMMENTS/FIELD NOTES:** \_\_\_\_\_

FIELD TEAM (initials) UR CG



## GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Deposition Area LOCATION ID 135  
 DATE 01/21/14

FIELD MEASUREMENT/  
 COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

**SAMPLING INFORMATION**

SAMPLE FIELD ID 135-1Q14

SAMPLE TIME 8:07

SAMPLING WATER LEVEL 09370

**ANALYSIS (circle)**

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
 SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175  
 E310.1 HACH  
 Other (specify) E2008

FIELD FILTERED Y  if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES: \_\_\_\_\_

FIELD TEAM (initials) W/CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Deposition Area LOCATION ID 13T

DATE 01/21/14

### FIELD MEASUREMENT/ COLLECTION EQUIPMENT

MAKE/MODEL SERIAL/ID #

PID METER -

HORRIBA U-22 C102359

WATER LEVEL INDICATOR C102854

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify)

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 13T-1Q14

SAMPLE TIME 1035

SAMPLING WATER LEVEL 6.62

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175

E310.1 HACH

Other (specify) E200-B

FIELD FILTERED Y  if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES: \_\_\_\_\_

FIELD TEAM (initials) LP CG



## GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Mini Site RW LOCATION ID 10N  
 DATE 01/22/14

FIELD MEASUREMENT/  
 COLLECTION EQUIPMENT                      MAKE/MODEL SERIAL/ID #                     

PID METER                     

HORRIBA U-22 C102389

WATER LEVEL INDICATOR                     

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECOMTAMINATION  N ALCONOX WASH  DISTILLED RINSE

**SAMPLING INFORMATION**

SAMPLE FIELD ID 10N-1014

SAMPLE TIME 1140

SAMPLING WATER LEVEL                     

**ANALYSIS (circle)**

- |                               |         |          |          |        |         |
|-------------------------------|---------|----------|----------|--------|---------|
| SW9060                        | SW9056  | E160.1   | SW8260B  | E300.0 | E300.0M |
| SW6010BF                      | SW6010B | SW8015-D | SW8015-P | SW6850 | RSK-175 |
| E310.1                        | HACH    |          |          |        |         |
| Other (specify) <u>E200.8</u> |         |          |          |        |         |

FIELD FILTERED Y  if yes, for which analysis                     

EQUIPMENT BLANK Y

QA/QC FIELD ID 10N-1014MS QA/QC TYPE MS

QA/QC FIELD ID 10N-1014SD QA/QC TYPE SD

QA/QC analysis different from original analysis? (circle) Y  If Yes, specify:                     

COMMENTS/FIELD NOTES:                       
                      
                      
                    

FIELD TEAM (initials) UP CB



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Mim Site RW LOCATION ID 106

DATE 01/22/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic (Other (specify) Residential)

DECONTAMINATION (Y) N ALCONOX WASH ✓ DISTILLED RINSE ✓

### SAMPLING INFORMATION

SAMPLE FIELD ID 106-1Q14

SAMPLE TIME 1007

SAMPLING WATER LEVEL —

### ANALYSIS (circle)

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify) <u>E200-8</u>					

FIELD FILTERED Y (N) if yes, for which analysis —

EQUIPMENT BLANK Y (N)

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) UPCG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID SW Deposition LOCATION ID 14B

DATE 9/21/14

**FIELD MEASUREMENT/  
COLLECTION EQUIPMENT**

MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Surface Water

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

**SAMPLING INFORMATION**

SAMPLE FIELD ID 14B-1014

SAMPLE TIME 1145

SAMPLING WATER LEVEL —

**ANALYSIS (circle)**

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175

E310.1 HACH

Other (specify) E200.8

FIELD FILTERED Y  if yes, for which analysis —

EQUIPMENT BLANK Y

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES: —

FIELD TEAM (initials) VP/CG





# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Tensy Lane LOCATION ID 11AL  
DATE 01/22/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT                      MAKE/MODEL SERIAL/ID #                     

PID METER                     

HORRIBA U-22 C102389

WATER LEVEL INDICATOR                     

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residual

DECONTAMINATION Y N ALCONOX WASH                      DISTILLED RINSE                     

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AL-1014

SAMPLE TIME 1048

SAMPLING WATER LEVEL                     

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175  
E310.1 HACH

Other (specify) E200.9

FIELD FILTERED Y  if yes, for which analysis                     

EQUIPMENT BLANK Y

QA/QC FIELD ID                      QA/QC TYPE                     

QA/QC FIELD ID                      QA/QC TYPE                     

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify:                     

COMMENTS/FIELD NOTES:                     

FIELD TEAM (initials) W/C















# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Tensy Lane LOCATION ID 11A4

DATE 01/20/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C 102389

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECOMTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 11A4-1014

SAMPLE TIME 1231

SAMPLING WATER LEVEL —

### ANALYSIS (circle)

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify) <u>E200-B</u>					

FIELD FILTERED Y  if yes, for which analysis —

EQUIPMENT BLANK Y

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES: —

FIELD TEAM (initials) WR CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Green Horn / Depositor LOCATION ID 11AA

DATE 01/21/14

### FIELD MEASUREMENT/ COLLECTION EQUIPMENT

MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AA-1Q14

SAMPLE TIME 1517

SAMPLING WATER LEVEL —

### ANALYSIS (circle)

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify) <u>E200 g</u>					

FIELD FILTERED Y  if yes, for which analysis —

EQUIPMENT BLANK Y

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES: —

FIELD TEAM (initials) LP CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Greenham / Deposition LOCATION ID 11AB

DATE 01/21/14

### FIELD MEASUREMENT/ COLLECTION EQUIPMENT

MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION Q N ALCONOX WASH ✓ DISTILLED RINSE ✓

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AB-1Q14

SAMPLE TIME 1459

SAMPLING WATER LEVEL —

### ANALYSIS (circle)

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify)		<u>E200-8</u>			

FIELD FILTERED Y (N) if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y (N)

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES: \_\_\_\_\_

FIELD TEAM (initials) VP CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Green Hum / Depositor LOCATION ID 11AC  
DATE 01/21/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION  N ALCONOX WASH — DISTILLED RINSE —

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AC1014

SAMPLE TIME 1608

SAMPLING WATER LEVEL —

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175  
E310.1 HACH  
Other (specify) E200 8

FIELD FILTERED Y  if yes, for which analysis —

EQUIPMENT BLANK Y

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) UP CB



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Greenham/Deposition LOCATION ID 11AG  
DATE 01/21/11

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION Y N ALCONOX WASH ✓ DISTILLED RINSE ✓

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AG-1Q14

SAMPLE TIME 1345

SAMPLING WATER LEVEL —

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175  
E310.1 HACH  
Other (specify) E200-B

FIELD FILTERED Y N if yes, for which analysis —

EQUIPMENT BLANK Y N

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES: —

FIELD TEAM (initials) UPCG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Greenhorn / Depositor LOCATION ID 11AH

DATE 01/21/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT                      MAKE/MODEL SERIAL/ID #                     

PID METER                     

HORRIBA U-22 C102389

WATER LEVEL INDICATOR                     

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic (Other) Residential

DECONTAMINATION  N ALCONOX WASH / DISTILLED RINSE /

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AH-1Q14

SAMPLE TIME 1223

SAMPLING WATER LEVEL                     

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M

SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175

E310.1 HACH

Other (specify) E200 Q

FIELD FILTERED Y  if yes, for which analysis                     

EQUIPMENT BLANK Y

QA/QC FIELD ID 11AH-1Q14FD QA/QC TYPE FD

QA/QC FIELD ID / QA/QC TYPE /

QA/QC analysis different from original analysis? (circle) Y  If Yes, specify:                     

COMMENTS/FIELD NOTES:                       
                      
                      
                    

FIELD TEAM (initials) LP / CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Green Hum / Deposition LOCATION ID 11A I

DATE 01/21/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER -

HORRIBA U-22 0102389

WATER LEVEL INDICATOR -

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION Y N ALCONOX WASH \_\_\_\_\_ DISTILLED RINSE \_\_\_\_\_

### SAMPLING INFORMATION

SAMPLE FIELD ID 11A I - 1014

SAMPLE TIME \_\_\_\_\_

SAMPLING WATER LEVEL -

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M

SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175

E310.1 HACH

Other (specify) E200 B

FIELD FILTERED Y  if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

FIELD TEAM (initials) LP CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Greenham / Deposition LOCATION ID 11AJ

DATE 01/21/14

### FIELD MEASUREMENT/ COLLECTION EQUIPMENT

MAKE/MODEL SERIAL/ID #

PID METER -

HORRIBA U-22 C102389

WATER LEVEL INDICATOR -

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AJ-1014

SAMPLE TIME 1302

SAMPLING WATER LEVEL -

### ANALYSIS (circle)

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify) <u>E200.8</u>					

FIELD FILTERED Y  if yes, for which analysis \_\_\_\_\_

EQUIPMENT BLANK Y

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC FIELD ID \_\_\_\_\_ QA/QC TYPE \_\_\_\_\_

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: \_\_\_\_\_

COMMENTS/FIELD NOTES: \_\_\_\_\_

FIELD TEAM (initials) UP CG







# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Greenhorn / Deposition LOCATION ID 11A0

DATE 01/21/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT                      MAKE/MODEL SERIAL/ID #                     

PID METER                     

HORRIBA U-22 C102389

WATER LEVEL INDICATOR                     

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 11A0-1Q14

SAMPLE TIME 1242

SAMPLING WATER LEVEL                     

### ANALYSIS (circle)

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify) <u>E200.8</u>					

FIELD FILTERED Y  if yes, for which analysis                     

EQUIPMENT BLANK Y

QA/QC FIELD ID                      QA/QC TYPE                     

QA/QC FIELD ID                      QA/QC TYPE                     

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify:                     

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) UP / CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Greenhorn / Deposition LOCATION ID 11AP

DATE 01/21/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AP

SAMPLE TIME 1545

SAMPLING WATER LEVEL —

### ANALYSIS (circle)

SW9060	SW9056	E160.1	SW8260B	E300.0	E300.0M
SW6010BF	SW6010B	SW8015-D	SW8015-P	SW6850	RSK-175
E310.1	HACH				
Other (specify) <u>E200 &amp;</u>					

FIELD FILTERED Y  if yes, for which analysis —

EQUIPMENT BLANK Y

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIELD TEAM (initials) UP CG



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Greenhorn/Deposition LOCATION ID 11AQ

DATE 01/21/14

FIELD MEASUREMENT/  
COLLECTION EQUIPMENT                      MAKE/MODEL SERIAL/ID #                     

PID METER                     

HORRIBA U-22 C102389

WATER LEVEL INDICATOR                     

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residential

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AQ-1014

SAMPLE TIME 1420

SAMPLING WATER LEVEL                     

### ANALYSIS (circle)

- SW9060    SW9056    E160.1    SW8260B    E300.0    E300.0M
- SW6010BF    SW6010B    SW8015-D    SW8015-P    SW6850    RSK-175
- E310.1    HACH
- Other (specify) E200.0

FIELD FILTERED    Y        if yes, for which analysis                     

EQUIPMENT BLANK    Y   

QA/QC FIELD ID                      QA/QC TYPE                     

QA/QC FIELD ID                      QA/QC TYPE                     

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify:                     

COMMENTS/FIELD NOTES:                       
                      
                      
                    

FIELD TEAM (initials) LP CC



# GROUNDWATER SAMPLING LOW-FLOW PURGE FIELD DATA SHEET

SITE ID Green Ham / Deposition LOCATION ID 11AY

DATE 01/22/14

### FIELD MEASUREMENT/ COLLECTION EQUIPMENT

MAKE/MODEL SERIAL/ID #

PID METER —

HORRIBA U-22 C102389

WATER LEVEL INDICATOR —

PUMP TYPE (circle) Grundfos Bladder Barcad Peristaltic Other (specify) Residantia

DECONTAMINATION  N ALCONOX WASH  DISTILLED RINSE

### SAMPLING INFORMATION

SAMPLE FIELD ID 11AY-1014

SAMPLE TIME 1108

SAMPLING WATER LEVEL —

### ANALYSIS (circle)

SW9060 SW9056 E160.1 SW8260B E300.0 E300.0M  
SW6010BF SW6010B SW8015-D SW8015-P SW6850 RSK-175

E310.1 HACH

Other (specify) E200-B

FIELD FILTERED Y  if yes, for which analysis —

EQUIPMENT BLANK Y

QA/QC FIELD ID — QA/QC TYPE —

QA/QC FIELD ID — QA/QC TYPE —

QA/QC analysis different from original analysis? (circle) Y N If Yes, specify: —

COMMENTS/FIELD NOTES: —

FIELD TEAM (initials) VP CG

**Appendix B**  
**Analytical Laboratory Data**

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**United States Environmental Protection Agency  
Region 9 Laboratory**

1337 S. 46th Street Building 201  
Richmond, CA 94804

**Date:** 2/11/2014

**Subject:** Analytical Testing Results - Project R14S33  
SDG: 14023A

**From:** Brenda Bettencourt, Director  
EPA Region 9 Laboratory  
MTS-2

**To:** Brunilda Davila  
California Site Cleanup Section 2  
SFD-7-2

Attached are the results from the analysis of samples from the **Lava Cap Mine 2014 Annual Monitoring** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Tom Lae, CH2M-Hill  
Bryan Jones, CH2M-Hill

**Analyses included in this report:**

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Metals by ICP/MS



United States Environmental Protection Agency  
**Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

**Project Manager:** Brunilda Davila

**Project Number:** R14S33

**Project:** Lava Cap Mine 2014 Annual Monitoring

**California Site Cleanup Section 2**

**75 Hawthorne Street**

**San Francisco CA, 94105**

**SDG:** 14023A

**Reported:** 02/11/14 17:43

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
10G_1Q14	1401038-01	Water	01/22/14 10:07	01/23/14 10:45
10N_1Q14	1401038-02	Water	01/22/14 11:40	01/23/14 10:45
11AA_1Q14	1401038-03	Water	01/21/14 15:17	01/23/14 10:45
11AB_1Q14	1401038-04	Water	01/21/14 14:59	01/23/14 10:45
11AC_1Q14	1401038-05	Water	01/21/14 16:08	01/23/14 10:45
11AG_1Q14	1401038-06	Water	01/21/14 13:48	01/23/14 10:45
11AH_1Q14	1401038-07	Water	01/21/14 12:23	01/23/14 10:45
11AH_1Q14FD	1401038-08	Water	01/21/14 12:23	01/23/14 10:45
11AI_1Q14	1401038-09	Water	01/21/14 12:05	01/23/14 10:45
11AJ_1Q14	1401038-10	Water	01/21/14 13:02	01/23/14 10:45
11AL_1Q14	1401038-11	Water	01/22/14 10:48	01/23/14 10:45
11AL-TREAT1_1Q14	1401038-12	Water	01/22/14 10:24	01/23/14 10:45
11AL-TREAT2_1Q14	1401038-13	Water	01/22/14 10:34	01/23/14 10:45
11AM_1Q14	1401038-14	Water	01/21/14 13:24	01/23/14 10:45
11AO_1Q14	1401038-15	Water	01/21/14 12:42	01/23/14 10:45
11AP_1Q14	1401038-16	Water	01/21/14 15:45	01/23/14 10:45
11AQ_1Q14	1401038-17	Water	01/21/14 14:20	01/23/14 10:45
11AS_1Q14	1401038-18	Water	01/20/14 12:05	01/23/14 10:45
11AS_1Q14FD	1401038-19	Water	01/20/14 12:05	01/23/14 10:45

**SDG ID 14023A**

**Work Order(s)**

**1401038**



**United States Environmental Protection Agency  
Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

<b>Project Manager:</b> Brunilda Davila	<b>California Site Cleanup Section 2</b>	<b>SDG:</b> 14023A
<b>Project Number:</b> R14S33	<b>75 Hawthorne Street</b>	<b>Reported:</b> 02/11/14 17:43
<b>Project:</b> Lava Cap Mine 2014 Annual Monitoring	<b>San Francisco CA, 94105</b>	

**Sample Results**

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
<b>Lab ID:</b> 1401038-01									<b>Water - Sampled: 01/22/14 10:07</b>
<b>Sample ID:</b> 10G_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		29		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-02									<b>Water - Sampled: 01/22/14 11:40</b>
<b>Sample ID:</b> 10N_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		86		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-03									<b>Water - Sampled: 01/21/14 15:17</b>
<b>Sample ID:</b> 11AA_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic	RE1	ND	U	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-04									<b>Water - Sampled: 01/21/14 14:59</b>
<b>Sample ID:</b> 11AB_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		0.86		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-05									<b>Water - Sampled: 01/21/14 16:08</b>
<b>Sample ID:</b> 11AC_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		ND	U	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-06									<b>Water - Sampled: 01/21/14 13:48</b>
<b>Sample ID:</b> 11AG_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		ND	U	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-07									<b>Water - Sampled: 01/21/14 12:23</b>
<b>Sample ID:</b> 11AH_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		ND	U	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-08									<b>Water - Sampled: 01/21/14 12:23</b>
<b>Sample ID:</b> 11AH_1Q14FD									<b>Metals by EPA 200 Series Methods</b>
Arsenic		ND	U	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-09									<b>Water - Sampled: 01/21/14 12:05</b>
<b>Sample ID:</b> 11AI_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		ND	U	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-10									<b>Water - Sampled: 01/21/14 13:02</b>
<b>Sample ID:</b> 11AJ_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		ND	U	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-11									<b>Water - Sampled: 01/22/14 10:48</b>
<b>Sample ID:</b> 11AL_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		26		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-12									<b>Water - Sampled: 01/22/14 10:24</b>
<b>Sample ID:</b> 11AL-TREAT1_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		1.1		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-13									<b>Water - Sampled: 01/22/14 10:34</b>
<b>Sample ID:</b> 11AL-TREAT2_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		1.7		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-14									<b>Water - Sampled: 01/21/14 13:24</b>



# United States Environmental Protection Agency Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone: (510) 412-2300 Fax: (510) 412-2302

<b>Project Manager:</b> Brunilda Davila <b>Project Number:</b> R14S33 <b>Project:</b> Lava Cap Mine 2014 Annual Monitoring	<b>California Site Cleanup Section 2</b> <b>75 Hawthorne Street</b> <b>San Francisco CA, 94105</b>	<b>SDG:</b> 14023A <b>Reported:</b> 02/11/14 17:43
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## Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
<b>Sample ID:</b> 11AM_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		0.34	C1, J	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-15									<b>Water - Sampled: 01/21/14 12:42</b>
<b>Sample ID:</b> 11AO_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		ND	U	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-16									<b>Water - Sampled: 01/21/14 15:45</b>
<b>Sample ID:</b> 11AP_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		0.54		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-17									<b>Water - Sampled: 01/21/14 14:20</b>
<b>Sample ID:</b> 11AQ_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		0.31	C1, J	0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-18									<b>Water - Sampled: 01/20/14 12:05</b>
<b>Sample ID:</b> 11AS_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		16		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401038-19									<b>Water - Sampled: 01/20/14 12:05</b>
<b>Sample ID:</b> 11AS_1Q14FD									<b>Metals by EPA 200 Series Methods</b>
Arsenic		17		0.50	ug/L	B14A054	01/24/14	02/06/14	200.8/SOP507

## Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch B14A054 - 200 Series Digest - Metals, ICP/MS</b>										
							<b>Prepared: 01/24/14 Analyzed: 02/06/14</b>			
<b>Metals by EPA 200 Series Methods - Quality Control</b>										
<b>Blank (B14A054-BLK1)</b>										
Arsenic	ND	U	0.5	ug/L						
<b>LCS (B14A054-BS1)</b>										
Arsenic	34.8		0.5	ug/L	40.0		87	85-115		200
<b>Matrix Spike (B14A054-MS1)</b>										
<b>Source: 1401038-02</b>										
Arsenic	127		0.5	ug/L	40.0	85.8	102	70-130		20
<b>Matrix Spike Dup (B14A054-MSD1)</b>										
<b>Source: 1401038-02</b>										
Arsenic	132		0.5	ug/L	40.0	85.8	115	70-130	4	20



United States Environmental Protection Agency  
**Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

**Project Manager:** Brunilda Davila

**Project Number:** R14S33

**Project:** Lava Cap Mine 2014 Annual Monitoring

**California Site Cleanup Section 2**

**75 Hawthorne Street**

**San Francisco CA, 94105**

**SDG:** 14023A

**Reported:** 02/11/14 17:43

**Qualifiers and Comments**

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



**United States Environmental Protection Agency  
Region 9 Laboratory**

1337 S. 46th Street Building 201  
Richmond, CA 94804

**Date:** 2/11/2014

**Subject:** Analytical Testing Results - Project R14S33  
SDG: 14023B

**From:** Brenda Bettencourt, Director  
EPA Region 9 Laboratory  
MTS-2

**To:** Brunilda Davila  
California Site Cleanup Section 2  
SFD-7-2

Attached are the results from the analysis of samples from the **Lava Cap Mine 2014 Annual Monitoring** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Tom Lae, CH2M-Hill  
Bryan Jones, CH2M-Hill

**Analyses included in this report:**

---

Metals by ICP/MS



United States Environmental Protection Agency  
**Region 9 Laboratory**

1337 S. 46th Street, Building 201, Richmond, CA 94804  
Phone:(510) 412-2300 Fax:(510) 412-2302

**Project Manager:** Brunilda Davila

**Project Number:** R14S33

**Project:** Lava Cap Mine 2014 Annual Monitoring

**California Site Cleanup Section 2**

**75 Hawthorne Street**

**San Francisco CA, 94105**

**SDG:** 14023B

**Reported:** 02/11/14 17:48

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
11AU_1Q14	1401039-01	Water	01/20/14 12:31	01/23/14 10:45
11AY_1Q14	1401039-02	Water	01/22/14 11:08	01/23/14 10:45
13Q_1Q14	1401039-03	Water	01/21/14 10:05	01/23/14 10:45
13R_1Q14	1401039-04	Water	01/21/14 11:06	01/23/14 10:45
13S_1Q14	1401039-05	Water	01/21/14 09:37	01/23/14 10:45
13T_1Q14	1401039-06	Water	01/21/14 10:35	01/23/14 10:45
14B_1Q14	1401039-07	Water	01/21/14 11:45	01/23/14 10:45
15A_1Q14	1401039-08	Water	01/21/14 11:36	01/23/14 10:45
15A_1Q14FD	1401039-09	Water	01/21/14 11:36	01/23/14 10:45
1R_1Q14	1401039-10	Water	01/20/14 09:55	01/23/14 10:45
5KD_1Q14	1401039-11	Water	01/20/14 13:04	01/23/14 10:45
5KS_1Q14	1401039-12	Water	01/20/14 13:51	01/23/14 10:45
5KS_1Q14FD	1401039-13	Water	01/20/14 13:51	01/23/14 10:45
5LD_1Q14	1401039-14	Water	01/20/14 15:33	01/23/14 10:45
5LS_1Q14	1401039-15	Water	01/20/14 16:32	01/23/14 10:45
5MD_1Q14	1401039-16	Water	01/20/14 14:34	01/23/14 10:45
5MS_1Q14	1401039-17	Water	01/20/14 08:51	01/23/14 10:45

**SDG ID 14023B**

**Work Order(s)**

**1401039**



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<b>Project Number:</b> R14S33	<b>75 Hawthorne Street</b>	<b>Reported:</b> 02/11/14 17:48
<b>Project:</b> Lava Cap Mine 2014 Annual Monitoring	<b>San Francisco CA, 94105</b>	

**Sample Results**

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
<b>Lab ID:</b> 1401039-01									<b>Water - Sampled: 01/20/14 12:31</b>
<b>Sample ID:</b> 11AU_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		2.9		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-02									<b>Water - Sampled: 01/22/14 11:08</b>
<b>Sample ID:</b> 11AY_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		0.40	C1, J	0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-03									<b>Water - Sampled: 01/21/14 10:05</b>
<b>Sample ID:</b> 13Q_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		170		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-04									<b>Water - Sampled: 01/21/14 11:06</b>
<b>Sample ID:</b> 13R_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic	RE1	48,000		500	ug/L	B14A055	01/24/14	02/07/14	200.8/SOP507
<b>Lab ID:</b> 1401039-05									<b>Water - Sampled: 01/21/14 09:37</b>
<b>Sample ID:</b> 13S_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic	RE1	6.8		0.50	ug/L	B14A055	01/24/14	02/07/14	200.8/SOP507
<b>Lab ID:</b> 1401039-06									<b>Water - Sampled: 01/21/14 10:35</b>
<b>Sample ID:</b> 13T_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		15		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-07									<b>Water - Sampled: 01/21/14 11:45</b>
<b>Sample ID:</b> 14B_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		83		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-08									<b>Water - Sampled: 01/21/14 11:36</b>
<b>Sample ID:</b> 15A_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		58		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-09									<b>Water - Sampled: 01/21/14 11:36</b>
<b>Sample ID:</b> 15A_1Q14FD									<b>Metals by EPA 200 Series Methods</b>
Arsenic		55		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-10									<b>Water - Sampled: 01/20/14 09:55</b>
<b>Sample ID:</b> 1R_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		17		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-11									<b>Water - Sampled: 01/20/14 13:04</b>
<b>Sample ID:</b> 5KD_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		41		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-12									<b>Water - Sampled: 01/20/14 13:51</b>
<b>Sample ID:</b> 5KS_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic	RE1	5.1		0.50	ug/L	B14A055	01/24/14	02/07/14	200.8/SOP507
<b>Lab ID:</b> 1401039-13									<b>Water - Sampled: 01/20/14 13:51</b>
<b>Sample ID:</b> 5KS_1Q14FD									<b>Metals by EPA 200 Series Methods</b>
Arsenic	RE1	5.1		0.50	ug/L	B14A055	01/24/14	02/07/14	200.8/SOP507
<b>Lab ID:</b> 1401039-14									<b>Water - Sampled: 01/20/14 15:33</b>



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<b>Project Number:</b> R14S33	<b>75 Hawthorne Street</b>	<b>Reported:</b> 02/11/14 17:48
<b>Project:</b> Lava Cap Mine 2014 Annual Monitoring	<b>San Francisco CA, 94105</b>	

**Sample Results**

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
<b>Lab ID:</b> 1401039-14									<b>Water - Sampled: 01/20/14 15:33</b>
<b>Sample ID:</b> 5LD_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		25		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-15									<b>Water - Sampled: 01/20/14 16:32</b>
<b>Sample ID:</b> 5LS_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic	RE1	1,400		25	ug/L	B14A055	01/24/14	02/07/14	200.8/SOP507
<b>Lab ID:</b> 1401039-16									<b>Water - Sampled: 01/20/14 14:34</b>
<b>Sample ID:</b> 5MD_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		22		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507
<b>Lab ID:</b> 1401039-17									<b>Water - Sampled: 01/20/14 08:51</b>
<b>Sample ID:</b> 5MS_1Q14									<b>Metals by EPA 200 Series Methods</b>
Arsenic		16		0.50	ug/L	B14A055	01/24/14	02/06/14	200.8/SOP507

**Quality Control**

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch B14A055 - 200 Series Digest - Metals, ICP/MS</b>										
<b>Prepared: 01/24/14 Analyzed: 02/06/14</b>										
<b>Metals by EPA 200 Series Methods - Quality Control</b>										
<b>Blank (B14A055-BLK1)</b>										
Arsenic	ND	U		0.5 ug/L						
<b>LCS (B14A055-BS1)</b>										
Arsenic	35.3			0.5 ug/L	40.0		88	85-115		200
<b>Matrix Spike (B14A055-MS2)</b>										
<b>Source: 1401039-03</b>										
Arsenic	264	Q10		1 ug/L	40.0	168	<b>238</b>	70-130		20
<b>Matrix Spike Dup (B14A055-MSD2)</b>										
<b>Source: 1401039-03</b>										
Arsenic	264	Q10		1 ug/L	40.0	168	<b>239</b>	70-130	0.2	20



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**Qualifiers and Comments**

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.

**Appendix C**  
**Historical Database Results (on CD)**  
**(Available upon Request)**

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