EXPANDED SITE INSPECTION
JORDAN CREEK HISTORIC MINING AREA

Technical Direction Document Number: 10-01-0006

April 2012

Prepared for:
United States Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101

Prepared by:

ECOLOGY AND ENVIRONMENT, INC.
720 Third Avenue, Suite 1700
Seattle, Washington 98104

RECEIVED
JUN 23 2012
DEPT. OF ENVIRONMENTAL QUALITY
WASTE PROGRAM

This page intentionally left blank.

Table of Contents

Section		Page
1	**Introduction**	**1-1**
2	**Site Background**	**2-1**
2.1	Site Location	2-1
2.2	Site Description	2-1
2.3	Site Ownership History	2-1
2.4	Site Operations and Source Characteristics	2-2
2.4.1	Historic Mining	2-2
2.4.2	Metallurgical Treatment	2-2
2.4.3	Historic Mercury Use	2-3
2.5	Naturally Occurring Mercury	2-3
2.6	Previous Investigations	2-4
2.6.1	University of Idaho, Student Oriented Study – 1973	2-4
2.6.2	BLM Mine Reconnaissance and Inventory – 1995	2-5
2.6.3	EPA Site Inspection – 1999	2-5
2.6.4	Idaho Geological Survey Site Inspection of Abandoned and Inactive Mines in Southern Idaho, Owyhee County – 2000	2-5
2.6.5	E & E ESI Sampling Strategy Memorandum – 2010	2-6
2.6.6	EPA Total Maximum Daily Load for Mercury in the Waters of Jordan Creek – 2011	2-6
2.7	Summary of ESI Investigation Locations	2-6
2.7.1	Sources	2-7
2.7.2	Targets	2-7
3	**Field Activities and Analytical Protocol**	**3-1**
3.1	Sampling Methodology	3-3
3.1.1	Soil and Sediment Sampling	3-3
3.1.2	Drinking Water Sampling	3-3
3.1.3	Spring and Seep Sampling	3-3
3.2	Analytical Protocol	3-3
3.3	Viewing of Mine Sites	3-4
3.4	Global Positioning System	3-5
3.5	Investigation-Derived Waste	3-5
4	**Quality Assurance/ Quality Control**	**4-1**

Table of Contents (cont.)

Section		Page
5	**Analytical Results Reporting and Definition of the Surface Water Migration Pathway**	**5-1**
5.1	Analytical Results Evaluation Criteria	5-1
5.2	Surface Water Migration Pathway Definition	5-1
6	**Potosi Mine**	**6-1**
6.1	Geologic Features	6-1
6.2	Site Ownership	6-2
6.3	Site History	6-2
6.4	Previous Mine Sampling	6-2
6.5	ESI Sampling	6-2
6.5.1	Waste Rock Samples	6-2
6.5.2	Sediment Samples	6-3
7	**Trade Dollar Mine**	**7-1**
7.1	Geologic Features	7-2
7.2	Ownership/Operator History	7-2
7.3	Site History	7-2
7.4	Previous Mine Sampling	7-3
7.5	ESI Sampling	7-3
7.5.1	Tailings Samples	7-3
7.5.2	Sediment Samples	7-4
8	**Dewey Mine**	**8-1**
8.1	Geologic Features	8-2
8.2	Ownership/Operator History	8-3
8.3	Site History	8-3
8.4	Previous Mine Sampling	8-4
8.4.1	Mercury Contamination Study	8-4
8.4.2	Environmental Baseline Study	8-4
8.4.3	Jordan Creek Watershed Site Inspection	8-5
8.4.4	Dewey Mine Site Inspection	8-5
8.4.5	Phase 1a Site Characterization and Screening Risk Analysis	8-6
8.5	ESI Sampling	8-7
8.5.1	Seep Samples	8-8
8.5.2	Sediment Samples	8-8
9	**Unnamed Gulch**	**9-1**
9.1	Geologic Features	9-2
9.2	Site Ownership	9-2
9.3	Site History	9-2
9.4	Previous Mine Sampling	9-2
9.5	ESI Sampling	9-2
9.5.1	Waste Rock Samples	9-2
9.5.2	Sediment Samples	9-3

Table of Contents (cont.)

Section		Page
10	**South Mountain Smelter Slag**	**10-1**
	10.1 Geologic Features	10-2
	10.2 Site Ownership	10-2
	10.3 Site History	10-2
	10.4 Previous Site Sampling	10-2
	10.5 ESI Sampling	10-2
	10.5.1 Slag Samples	10-2
	10.5.2 Burned Material Sample	10-3
	10.5.3 Sediment Samples	10-3
11	**Jordan Creek Mills Upstream of Silver City**	**11-1**
	11.1 Geologic Features	11-1
	11.2 Site Ownership	11-2
	11.3 Site History	11-2
	11.4 Previous Site Sampling	11-2
	11.5 ESI Sampling	11-3
12	**Silver City Drinking Water**	**12-1**
	12.1 ESI Sampling	12-1
13	**Summary**	**13-1**
14	**References**	**14-1**
A	**Sample Plan Alteration Forms**	**A-1**
B	**Chain-of-Custody Documentation**	**B-1**
C	**Data Validation Memoranda**	**C-1**
D	**Global Positioning System Coordinates**	**D-1**

This page intentionally left blank.

List of Tables

Table **Page**

Table 3-1 Fixed Laboratory Sample Collection Summary 3-6

Table 3-2 Sample Coding 3-9

Table 6-1 Potosi Mine Waste Rock Samples Analytical Results Summary 6-8

Table 6-2 Potosi Mine Sediment Samples Analytical Results Summary 6-9

Table 7-1 Trade Dollar Mine Ownership/Operator History 7-11

Table 7-2 Trade Dollar Mine Tailings/Waste Rock Pile Samples Analytical Results Summary 7-12

Table 7-3 Trade Dollar Mine Sediment Samples Analytical Results Summary 7-13

Table 8-1 Dewey Mine Seep Samples Analytical Results Summary 8-18

Table 8-2 Dewey Mine Sediment Samples Analytical Results Summary 8-19

Table 9-1 Unnamed Gulch Tailings Pile Samples Analytical Results Summary 9-11

Table 9-2 Unnamed Gulch Sediment Samples Analytical Results Summary 9-12

Table 10-1 South Mountain Smelter Slag Samples Analytical Results Summary 10-9

Table 10-2 South Mountain Smelter Slag Sediment Samples Analytical Results Summary .. 10-10

Table 11-1 Jordan Creek Mills Sediment Samples Analytical Results Summary 11-8

Table 12-1 Silver City Drinking Water Samples Analytical Results Summary 12-3

This page intentionally left blank.

List of Figures

Figure **Page**

Figure 2-1 Site Vicinity Map 2-9

Figure 2-2 Mines and Creeks Site Map 2-11

Figure 6-1 Potosi Mine Site Map 6-4

Figure 6-2 Potosi Mine 15-Mile Target Distance Limit Map 6-5

Figure 6-3 Potosi Mine Sample Locations and Mercury Results 6-7

Figure 7-1 Trade Dollar Mine Site Map 7-5

Figure 7-2 Trade Dollar Mine 15-Mile Target Distance Limit Map 7-7

Figure 7-3 Trade Dollar Mine Ownership Map 7-9

Figure 7-4 Trade Dollar Mine Sample Locations and Mercury Results 7-10

Figure 8-1 Dewey Mine Site Map 8-9

Figure 8-2 Dewey Mine 15-Mile Target Distance Limit Map 8-11

Figure 8-3 Dewey Mine Ownership Map 2001 8-13

Figure 8-4 Dewey Mine Site Inspection Source Sample Location and Mercury Results Map 8-14

Figure 8-5 Dewey Mine Site Inspection Sediment Sample Locations and Mercury Results 8-15

Figure 8-6 Dewey Mine Phase 1A Site Characterization and Screening Risk Analysis Sample Locations and Mercury Results 8-16

Figure 8-7 Dewey Mine ESI Sample Locations and Mercury Results 8-17

Figure 9-1 Unnamed Gulch Site Vicinity 9-4

Figure 9-2 Unnamed Gulch Tailings Pile Site Map 9-5

Figure 9-3 Unnamed Gulch 15-Mile Target Distance Limit Map 9-7

List of Figures (cont.)

Figure **Page**

Figure 9-4 Unnamed Gulch Ownership Map 9-9

Figure 9-5 Unnamed Gulch Tailings Pile Sample Locations and Mercury Concentrations Map 9-10

Figure 10-1 South Mountain Smelter Slag Site Map 10-4

Figure 10-2 South Mountain Smelter Slag 15-Mile Target Distance Limit Map 10-5

Figure 10-3 South Mountain Smelter Slag Ownership Map 10-7

Figure 10-4 South Mountain Smelter Slag Sample Locations 10-8

Figure 11-1 Jordan Creek Mills Site Map 11-4

Figure 11-2 Jordan Creek Mills 15-Mile Target Distance Limit Map 11-5

Figure 11-3 Jordan Creek Mills Sediment Sample Locations and Mercury Results 11-7

Figure 12-1 Silver City Drinking Water Sample Locations 12-2

Mine Site Photographic Documentation

6. Potosi Mine Photographic Documentation 6-11

7. Trade Dollar Mine Photographic Documentation 7-15

8. Dewey Mine and Mill Photographic Documentation 8-21

9. Unnamed Gulch Photographic Documentation 9-13

10. South Mountain Smelter Slag Photographic Documentation 10-11

11. Jordan Creek Mills Photographic Documentation 11-9

12. Silver City Drinking Water Samples Photographic Documentation 12-5

List of Abbreviations and Acronyms

Term	Definition
µg/L	Micrograms per liter
bgs	Below ground surface
BLM	Bureau of Land Management
BS	Blank spike
cfs	Cubic feet per minute
CLP	Contract Laboratory Program
DQO	Data Quality Objective
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
ESI	Expanded Site Inspection
GPS	Global Positioning System
IDEQ	Idaho Department of Environmental Quality
IDL	Idaho Department of Lands
IDW	Investigation-derived waste
IGS	Idaho Geological Survey
JCHMA	Jordan Creek Historic Mining Area
MCL	Maximum Contaminant Level
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
PA	Preliminary Assessment
PPE	Probable point of entry
ppm	Parts per million
PSSC	Palustrine scrub/shrub seasonally flooded
QA	Quality Assurance
QC	Quality Control
SI	Site Inspection
SPAF	Sample Plan Alteration Form
SQAP	Sampling and Quality Assurance Plan
START	Superfund Technical Assessment and Response Team
TAL	Target Analyte List
TMDL	Total Maximum Daily Load
TDD	Technical Direction Document
TDL	Target Distance Limit
TM	Task Monitor
XRF	X-Ray Fluorescence

This page intentionally left blank.

1 Introduction

Ecology and Environment, Inc., (E & E) was tasked by the United States Environmental Protection Agency (EPA) to provide technical support for completion of an Expanded Site Inspection (ESI) at the Jordan Creek Historic Mining Area (JCHMA). E & E completed ESI activities under Technical Direction Document Number 10-01-0006, issued under EPA, Region 10, Superfund Technical Assessment and Response Team (START)-3 Contract Number EP-S7-06-02.

The specific goals for the JCHMA ESI, identified by the EPA, are:

- Determine the potential threat to public health or the environment posed by the site;
- Determine the potential for a release of hazardous constituents into the environment; and
- Determine the potential for placement of the site on the National Priorities List.

Completion of the ESI included reviewing existing site information, determining regional characteristics, collecting receptor information within the range of site influence, executing a sampling plan, and producing this report. The report is organized as follows:

- Section 1, Introduction – Authority for performance of this work, goals for the project, and summary of the report contents;
- Section 2, Background – Site description, site operations and waste characteristics, and a summary of investigation locations;
- Section 3, Field Activities and Analytical Protocol – Summary of the field effort;
- Section 4, Quality Assurance (QA)/Quality Control (QC) – Summary of the laboratory data;
- Section 5, Analytical Results Reporting and Definition of Surface Water Migration Pathway – Discussion of results reporting criteria and a description of the surface water migration pathway;
- Sections 6 through 12, Source Areas – Discussions of site sources, sample locations, and analytical results;
- Section 13, Summary – Summary of the investigation; and
- Section 14, References – Alphabetical listing of the references cited throughout the text.

This page intentionally left blank.

2 Site Background

This section describes the background of the site, including location, description, ownership history, operations and source characteristics, and previous investigations.

2.1 Site Location

Site Name:	Jordan Creek Historic Mining Area
CERCLIS ID Number:	IDSFN1002087
Latitude:	42° 45' North
Longitude:	116° 45' West
County:	Owyhee
Congressional District:	1

2.2 Site Description

The JCHMA was once a thriving mining district located near the headwaters of Jordan Creek (Figure 2-1). Jordan Creek originates in southwest Idaho and flows west to the Owyhee River and Owyhee Reservoir. The upper reaches of the watershed are located in the Owyhee Mountains of Idaho. Numerous springs and tributaries exist within the upper reaches of the watershed, many of which are perennial (E & E 1999).

The Jordan Creek watershed is sparsely populated, with scattered rural ranches located throughout the drainage (E & E 1999). Silver City is located near the headwaters of Jordan Creek. The town has no permanent residents; however, during the summer months, owners of homes and businesses reside in the town, and the town is a tourist attraction due to its historic nature.

The main access to the upper reaches of the Jordan Creek watershed is via secondary or unimproved roads. Snow falls heavily in the winter. Roads in the upper watershed are typically closed from November until late June or early July.

2.3 Site Ownership History

Public lands managed by the Bureau of Land Management (BLM) and state lands managed by the Idaho Department of Lands (IDL) make up the majority of lands in the upper reaches of Jordan Creek. Privately held or leased lands are generally located adjacent to the creek beds (E & E 1999).

2.4 Site Operations and Source Characteristics

2.4.1 Historic Mining

The town of Silver City was once the center of a thriving mining district that produced large quantities of gold and silver. Prospectors found gold in Jordan Creek in 1863, stimulating the influx of hundreds of people seeking employment. Within a year, miners following the gold upstream found two large vein deposits on opposite sides of War Eagle Mountain (Figure 2-2), launching underground mining activities in the region (E & E 1999).

Early underground mines included deposits of enriched ores that contained metals weathered out from portions of the vein and redeposited just below the surface. The mines soon worked through the bonanza into the unenriched primary vein below. The primary ore was much leaner than the enriched ore and had a much lower proportion of gold to silver. In 1875, this low-grade ore, combined with the failure of the Bank of California, led to the closure of the underground mines (E & E 1999).

The discovery of new veins launched a second period of mining in 1889. Production rapidly rose to levels comparable to those of the 1860s, continued to be high for about a decade, and then declined until 1914. At the height of mining activities in this period, there were hundreds of mines and eight mills operating in the Silver City area. As the milling operations required large quantities of water, the historic mills were generally located immediately adjacent to perennial streams, including Jordan Creek (E & E 1999).

Mining after 1914 maintained a very low level of production that essentially ended in early 1942, though some sporadic mining occurred after this. Many gold mines abruptly closed after the industry was declared not essential to the war economy (E & E 1999).

2.4.2 Metallurgical Treatment

In the effort to obtain the highest possible recovery of precious metals from the Silver City ores, many metallurgical processes and devices were employed. In the early days of the camp, the free-milling of (yielding gold or silver by crushing and amalgamation, without roasting or other chemical treatment) oxidized ores was conducted by wet crushing the ore with stamps, followed by plate amalgamation. Several arrastras (primitive mills used for grinding ore by dragging stones in a circular pit with a stone floor) operated successfully on these ores for many years. As the silver content of the mill feed increased, with increased depth, modifications become necessary. In some mills, various concentrating devices were used to treat the tailings from the amalgamating plates. In others, the ore was subjected to a preliminary roast, either with or without chloridization. These modifications were not fully effective, and the plate amalgamation process gradually came into disuse (IBM&G 1926).

During the 1880s and early 1890s, pan amalgamation, preceded or followed by concentration, was used to the virtual exclusion of all other methods throughout the Silver City region (IBM&G 1926).

2.4.3 Historic Mercury Use

During historic mining activities in the Owyhee Mountains, between 1863 and 1942, elemental mercury (quicksilver) was used in stamp milling, dredge mining, and, to a lesser degree, in other types of placer mining for gold. At Silver City, a type of milling known as the Washoe Pan Process is believed to have resulted in the discharge of large quantities of quicksilver into Jordan Creek. The Idaho Historical Society estimates that one mill in Silver City (located near the headwaters of Jordan Creek) contributed 2.5 tons of mercury to Jordan Creek from 1866 to 1968. It is also estimated that between 0.25 ounces and 1.5 pounds of elemental mercury were discharged in the waste water per ton of gold ore processed (E & E 1999).

In 2006, Mr. Jim Hyslop, a member of the Owyhee County Historic Society and part-time Silver City resident, completed a report for the Idaho Department of Environmental Quality (IDEQ) summarizing historic mercury use in the mining district near Silver City. This report states that in both placer and hardrock mining, mercury produced the best method of maximizing precious metals recovery, and in placer mining and arrastra mills, the loss of mercury was not readily controllable due to the necessary water agitation in the process. In placer mining, this loss of mercury was reported be as high as 30 percent. The report also states that mercury was freighted into the mining district, likely from California. It reports the costs of mercury from 1850 to 1900 as ranging from $30 to $100 per flask, with each flask containing 72 pounds of mercury. It also cites one source, who prefers to remain anonymous, who states that dredging of Jordan Creek during the 1930s produced on the floors of the dredge "more mercury than they could deal with. The mercury was accumulated from the gravel deposit" (Hyslop 2006).

2.5 Naturally Occurring Mercury

In 1973, a geology major at the University of Idaho, College of Mines completed a study of mercury and heavy metals pollutants in the Jordan Creek drainage. For this work, 26 samples of igneous rock were collected in the upper Jordan Creek drainage and adjacent to tributaries to determine the background concentrations of mercury in the area. Rock types sampled included rhyolite, basalt, and granite. Eighty percent of these samples did not contain mercury above the detection limit of 0.1 parts per million (ppm). The average mercury concentration was determined to be 0.206 ppm (i.e., milligrams per kilogram [mg/kg]). One sample had an anomalously high concentration of 6.2 ppm (not included in the average) and was interpreted to indicate the proximity of a cinnabar occurrence. Three samples collected from known mineralized areas in rhyolitic terrain contained mercury at 0.5, 1.0, and 1.18 ppm (Hill 1973).

This study concluded that based on the concentrations of mercury found in igneous rock, there was no reason to suspect that the magnitude of mercury contamination present in Jordan Creek (see Section 2.6 below, Previous Investigations) was caused or significantly contributed to by the naturally occurring geologic rock environment (Hill 1973).

2.6 Previous Investigations

A number of investigations have been completed along the Jordan Creek watershed. Many of these studies were completed as a result of documented mercury contamination known to be present in fish from Jordan Creek and the Owyhee Reservoir (E & E 1999). The following sections describe previous environmental investigations that have been conducted on a watershed-wide basis. Investigations relating to specific mine sites are discussed later in chapters relating to those specific mines (Sections 7 through 11).

2.6.1 University of Idaho, Student Oriented Study – 1973

As mentioned previously, in 1973, a geology major at the University of Idaho, College of Mines completed a study of mercury and heavy metals pollutants in the Jordan Creek drainage. With the assumption that mercury would have been discarded with the gangue materials on the waste rock dumps, this study collected 13 samples from various depths within selected waste rock piles. Sample depths ranged from 1 to 12 feet below ground surface (bgs). Mercury concentrations ranged from not detected at a detection limit of 0.1 ppm (one sample only) to 9.23 ppm in a sample collected from 9 feet bgs (Hill 1973).

Over 90 water samples were collected from the Jordan Creek drainage; however, sample results were determined to be inconclusive since the results were consistently below the detection limits of 0.2 parts per billion in active stream environments. It was speculated that the low solubility of mercury and a lack of mercury mobility, as well as the dilution effect of rapid runoff, may have affected the mercury results (Hill 1973).

One hundred and twenty six sediment samples were collected along the Jordan Creek drainage and adjacent tributaries from above Silver City to below Antelope Reservoir in Oregon. Results of sediment samples ranged from the detection limit of 0.1 ppm to 1,685 ppm (near the DeLamar Mine). Field investigations of sample locations with high mercury concentrations revealed the presence of milling sites immediately above these areas. Mercury values upstream of the mills sites decreased to near background levels (Hill 1973).

In addition, 47 soil samples were collected from former mill locations in a grid fashion. Most former mills soils had a circular area of mercury contamination, with low mercury values on the margins and higher values near the center. On sloped terrain, the highest concentrations of mercury observed were in the lower levels of the mills, possibly near amalgamation points. Mercury concentrations ranged from 0.1 to 565 ppm in mill soils (Hill 1973).

The study concluded that erosion of mills areas would contaminate the sediments of adjacent stream beds and the soils of stream banks and that this contamination would move further downstream during high runoff events (Hill 1973).

2.6.2 BLM Mine Reconnaissance and Inventory – 1995

In 1995, the BLM conducted a mine reconnaissance and inventory in southeastern Idaho. The majority of mines included in this effort were clustered in the DeLamar Mountain, Silver City, War Eagle Mountain, and South Mountain areas, and, to a lesser extent, in the Flint Creek area. The vast majority of mines were inactive. Most sites were less than 5 acres in size and consisted of an adit or shaft with a small tailings/waste rock pile. Approximately one-third of the adits had some flowing water or ponding (BLM 1995).

2.6.3 EPA Site Inspection – 1999

In 1999, E & E performed a site inspection (SI) for the EPA that included a broad survey of metals concentrations in the Jordan Creek watershed. This SI primarily involved the collection of sediment samples, though it included some surface water samples as well. The SI encompassed the entire Jordan Creek watershed, located in eastern Malheur County, Oregon, and northwest Owyhee County, Idaho. All sediment samples (167 samples total) were field screened using an x-ray fluorescence spectroscopy (XRF) unit. A small sub-set of these samples also were submitted for fixed laboratory analysis. The sampling event took place in October 1998. The sampling design was structured in a manner that would allow identification of tributaries to Jordan Creek that may be contributing to metals loading (E & E 1999).

The SI concluded that several metals were present in mine wastes and that these metals had migrated to the sediments of the Jordan Creek watershed. The zone of impact was determined to extend 70 miles downstream from the Silver City mining district (E & E 1999).

2.6.4 Idaho Geological Survey Site Inspection of Abandoned and Inactive Mines in Southern Idaho, Owyhee County – 2000

In 2000, the Idaho Geological Survey (IGS) conducted an SI that was a focused survey of mines, mills, and other ore processing facilities in the Silver City and War Eagle Mountain areas, near the headwaters of Jordan Creek. This work did not include all mines in the Jordan Creek watershed. A total of 64 mine locations were visited in July 1999 for this SI. Some mines with a potential for impacting adjacent waterways were sampled. In these cases, a limited number of samples were collected. Matrices sampled included waste rock, tailings, slag, adit water, and surface water, though not all of these sample types were collected at each site. All samples were submitted for fixed laboratory analysis of metals concentrations (IGS 2000).

The SI concluded that of the 43 mining sites examined in the Silver City/War Eagle Mountain area, five had the potential to impact adjacent waterways, and that

of the 21 mining sites examined in the Flint Creek/South Mountain areas, four had the potential to impact adjacent waterways (IGS 2000).

2.6.5 E & E ESI Sampling Strategy Memorandum – 2010

In 2010, E & E prepared a sampling strategy memorandum for this ESI (E & E 2010). The memorandum compared sampling data from the EPA SI to data from the IGS SI, in addition to data from a variety of mine-specific studies, in order to identify mines and streams that may require additional sampling. This information was used to determine:

- Locations where both investigations indicate that a site is affecting adjacent surface water;
- Mines that have sources in contact with adjacent surface water bodies not sampled as a part of the IGS; and
- Water bodies that may be impaired based on E & E SI data, but for which a search for sources has not been conducted.

From this work, and after consultation with EPA and IDEQ representatives, several mines and streams were determined to be appropriate for investigation as a part of this ESI. These features are outlined in Section 2.7.

2.6.6 EPA Total Maximum Daily Load for Mercury in the Waters of Jordan Creek – 2011

Jordan Creek has been identified by IDEQ as an impaired water body due to the presence of mercury pollution under the Federal Clean Water Act. In August 2011, the EPA's Office of Water completed a draft report regarding the total maximum daily load (TMDL) for mercury in the waters of Jordan Creek. The purpose of the TMDL study was to establish mercury TMDLs to improve water quality in Jordan Creek in order to ensure its safety for humans, fish, and wildlife. The study asserts that mercury from diffuse sources such as water runoff from land in historic mining areas is the primary cause of mercury water quality degradation in the Jordan Creek watershed. This study summarizes fish tissue sampling that was conducted in the watershed in 2005. Three redband trout collected from Jordan Creek near Silver City were found to contain mercury at concentrations of 0.552, 0.481, and 0.688 mg/kg, all of which exceeded the human health consumption criterion of 0.3 mg/kg. The TMDL study established a water quality target for mercury of 0.01 micrograms per liter (µg/L; i.e., 0.0001 milligrams per liter [mg/L]) in the upper Jordan Creek watershed (EPA 2011).

2.7 Summary of ESI Investigation Locations

Sampling under the JCHMA ESI was conducted in areas considered potential contamination sources and in areas that may have been contaminated through the migration of hazardous materials regulated by the Comprehensive Environmental Response, Compensation, and Liability Act. The features identified for inspection under the JCHMA ESI are discussed below and are depicted on Figure 2-2.

2.7.1 Sources

- **Potosi Mine** – This mine contains a waste rock pile that extends into Long Gulch, a tributary to Jordan Creek.
- **Other Mines on Long Gulch** - Topographic maps of this area indicate several adits, the Trade Dollar Mine, the Erdman Mine, and an open pit mine on Long Gulch. Leviathan Gulch and Coffee Gulch are tributaries of Long Gulch and also may contain mines or adits, though none are depicted on the topographic maps. The EPA Idaho Operations Office supplied a map of "Mines of Idaho Portion of Jordan Creek Subbasin," which shows six mines on this drainage, including the Potosi Mine (Rueda 2010).
- **Mines near China Creek** – If present, mines near this stream may be contributing to metals contamination in Jordan Creek.
- **South Mountain Smelter Slag** – This site contains slag that is present within several feet of Williams Creek, a tributary to Jordan Creek.
- **Adits** - Flowing adits may be present at mines sites. These adits, if present, may be contributing to metals contamination in Jordan Creek and its tributaries.

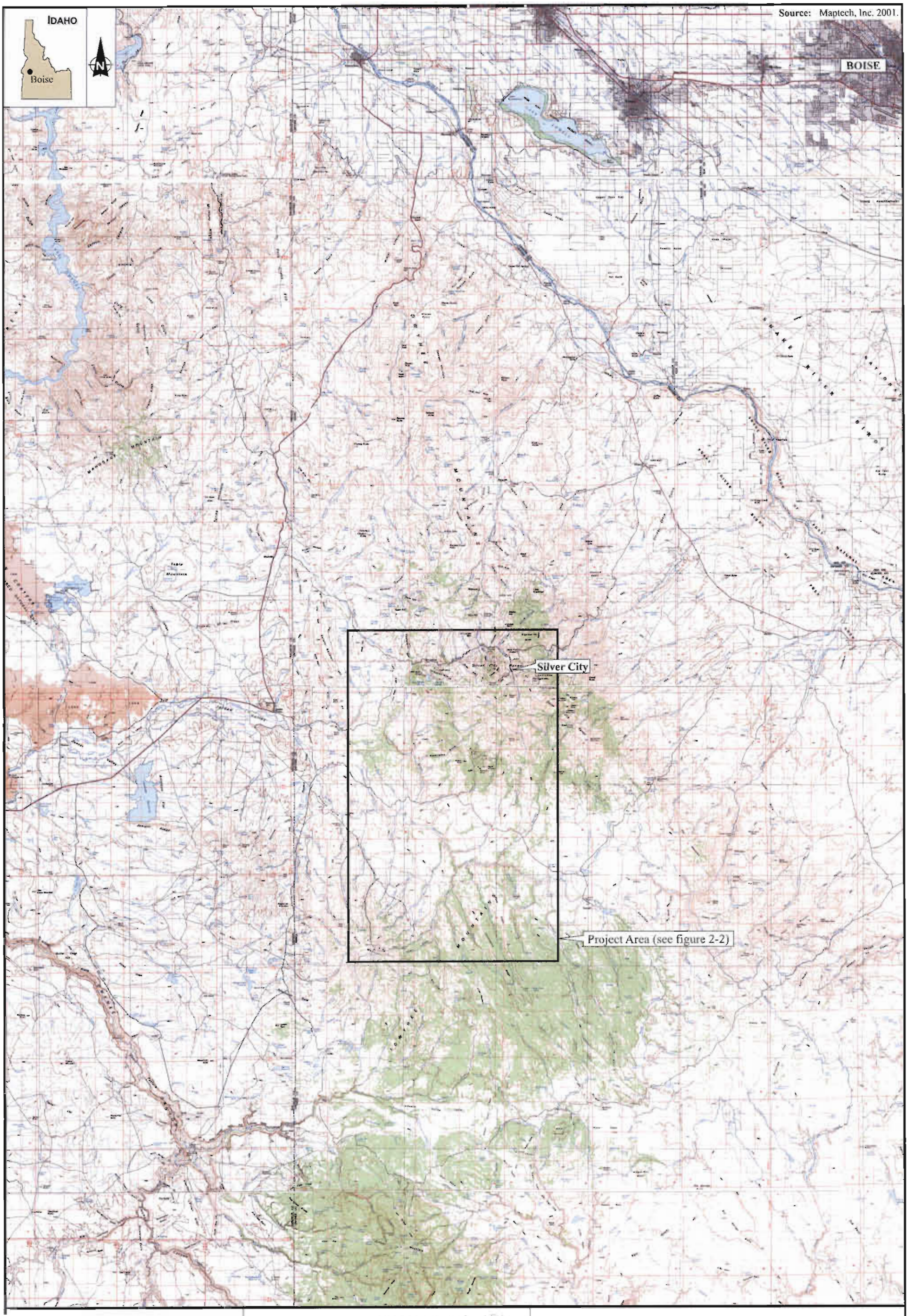
Other sites were determined to be of interest but were not included in this ESI for sampling, generally because sufficient sampling data already exists for them. Two of these sites were selected to be viewed (from off the property) to determine their current conditions and whether they appear to be impacting adjacent streams:

- **Sonnemann Mine** – This mine once contained tailings that extended into Williams Creek, a tributary to Jordan Creek. The mine also contained waste rock and had a flowing adit.
- **Dewey Mine** – This mine contains a waste rock pile that reaches Jordan Creek and seeps that discharge directly to the creek.

2.7.2 Targets

- **Jordan Creek Tributaries** – may have been impacted by mining operations and, in turn, may be impacting Jordan Creek.
- **Williams Creek** in the vicinity of South Mountain Smelter.
- **Long Gulch** in the vicinity of Potosi Mine, Trade Dollar Mine, and other mines/mills as located during the ESI field event.
- **China Creek** wherever mines, mills, or smelters exist near it, if discovered.

This page intentionally left blank.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK HISTORIC MINING AREA
EXPANDED SITE INSPECTION
Silver City, Idaho

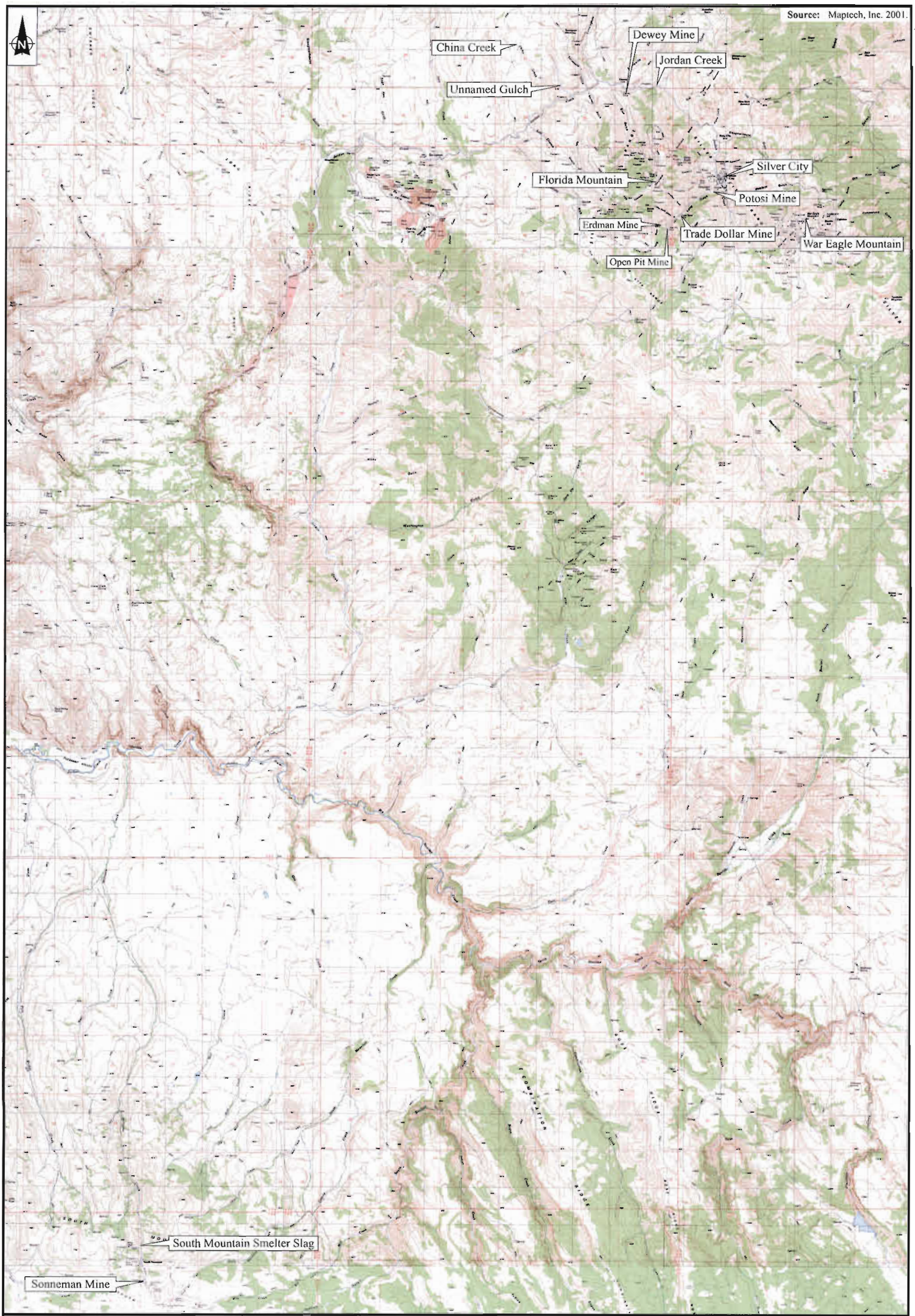
Figure 2-1
SITE VICINITY MAP

0 3 6
Approximate Scale in Miles

Date: 12/12/11

Drawn by: AES

10:START-3\10010006\fig 2-1



ecology and environment, inc. Global Specialists in the Environment Seattle, Washington	JORDAN CREEK HISTORIC MINING AREA EXPANDED SITE INSPECTION Silver City, Idaho	Figure 2-2 MINES AND CREEKS SITE MAP	
	0 .75 1.5 Approximate Scale in Miles	Date: 12/12/11	Drawn by: AES	10:START-3\10010006\fig 2-2

3 Field Activities and Analytical Protocol

A sampling and quality assurance plan (SQAP) for the JCHMA ESI was developed by the START prior to field sampling (E & E 2011a). The SQAP describes the sampling strategy, sampling methodology, and analytical program used to investigate potential hazardous substance sources and potential targets in the area. In general, ESI field activities were conducted in accordance with the approved SQAP; however, there were several deviations. Deviations to the SQAP primarily stemmed from incorporating new information encountered during the field event into the sampling program. These deviations are documented in the Sample Plan Alteration Forms (SPAFs) provided in Appendix A. All deviations to the SQAP were pre-approved by the EPA Task Monitor (TM) during the field sampling event. The more significant deviations were as follows:

- **Other Mines in Long Gulch** – The SQAP called for sampling the Trade Dollar Mine as well as other mines encountered during the field event in Long Gulch. The Trade Dollar Mine was sampled; however, during conversations with local long-time residents of Silver City, it was determined that there were no other significant remains of mining operations in Long Gulch, with the exception of some waste rock piles associated with operations at the Stone Cabin Mine; a mine that was not included in the original SQAP because it is an active mine and is receiving regulatory oversight. Stone Cabin Mine works ore deposits in Florida Mountain from a mine pit excavated on the top of the mountain extending down the western side of the ridge line, opposite Long Gulch. The primary and largest waste rock piles for this mine also are located on the western side of the ridgeline. Since it appeared a search for additional mine sites on Long Gulch would not be successful, and because new information was obtained regarding other possible milling operations upstream of Silver City on Jordan Creek, a decision was made to attempt to locate these mills on Jordan Creek, rather than search for other mines or mills on Long Gulch.
- **Mills on Jordan Creek** – A Silver City resident described the following features upstream of Silver City on Jordan Creek:
  - The remains of the Cosmos stamp mill near the Silver City campground;
  - The remains of Poorman stamp mill, approximately 0.75 miles upstream of Silver City; and

- The remains of the Shonebar stamp mill, also approximately 0.75 mile upstream of Silver City.

A ground search was conducted for the remains of each of these mills; however, no remains were found. Although the specific locations of these mills were not evident, several sediment samples were still collected from Jordan Creek upstream of Silver City to determine whether the stream was being impacted by mercury in these areas. Section 11 provides a detailed discussion of this sampling.

- **Mines on China Creek** – The SQAP called for sampling China Creek if mines or mills on this creek could be located, since a sediment sample collected from Jordan Creek near this stream contained elevated concentrations of mercury and other metals. Originally, this sediment sample was thought to have been collected downstream of this tributary, but this was found to be incorrect; it was collected approximately 50 feet upstream of this confluence. The next most upstream sediment sample from Jordan Creek was collected at the Dewey Mine. A search for other possible sources of this contamination between the Dewey Mine and the sample near China Creek revealed the presence of two tailings piles in an unnamed gulch. For this reason, this unnamed gulch became the focus of sampling in place of China Creek. Section 9 provides a detailed discussion of this sampling.
- **Adits** - Flowing adits, if present, were to be sampled as a part of this ESI. Since no flowing adits were encountered, a decision was made to instead collect drinking water samples from taps in Silver City to determine the quality of this water in relation to metals. Section 12 provides a detailed discussion of this sampling.
- **Dewey Mine** - Since the Dewey Mine has been the subject of more than one stand-alone field sampling investigation, this mine was not intended to be sampled as a part of this ESI. However, the ESI did include a requirement for viewing this mine to determine its current general condition. During this viewing, two seeps were observed to be discharging water directly into Jordan Creek from the base of a waste rock pile. Local residents of Silver City stated that significant quantities of mercury may be present in Jordan Creek near this mine. For this reason, and since the last known sampling conducted near this mine was in 2001, a decision was made to resample Jordan Creek sediments near the Dewey Mine as well as the two seeps in order to ascertain the current condition of the seeps and sediments at this location. Section 8 provides a detailed discussion of this sampling.

The ESI field sampling event was conducted from September 18, 2011, through September 23, 2011. A total of 44 samples, including background samples, were collected for the ESI. Sample types and methods of collection are described below. A list of all samples collected for laboratory analysis under this ESI is contained in Table 3-1. Chain-of-custody forms are provided in Appendix B.

Laboratory data sheets of analytical results for all samples are provided in Appendix C.

Alphanumeric identification numbers applied by the START to each sample location (e.g., PT01SS) are used in this report as the sample location identifiers. Table 3-2 summarizes the sample coding system used for formulating sample numbers. For example, the sample number PT01SS indicates the following: PT for the source code (in this case for Potosi Mine), 01 for the sequential number of samples from a given source area by matrix (in this case, the first soil sample from Potosi Mine), and SS for the sample matrix (in this case surface soil).

This section describes sampling methodology, analytical protocol, global positioning system (GPS) coordinates, and investigation-derived waste (IDW).

3.1 Sampling Methodology

All ESI samples were stored on ice in coolers continuously maintained under the custody of START personnel. Sampling methods used for each sample type are described below.

3.1.1 Soil and Sediment Sampling

Surface soil and sediment were collected from 0 to 6 inches bgs using dedicated stainless steel spoons. Collected material was placed in a dedicated plastic bowl. Grass leaves and other vegetative material, rocks, and other debris unsuitable for analysis were removed from samples before being homogenized; then sample material was thoroughly homogenized and placed into pre-labeled sample containers.

3.1.2 Drinking Water Sampling

All drinking water samples were collected directly into pre-preserved sample containers from kitchen taps. All taps were allowed to run for 5 minutes before sampling to clear the water distribution lines.

3.1.3 Spring and Seep Sampling

All spring and seep samples were collected directly into pre-preserved sample containers.

3.2 Analytical Protocol

Analytical protocols applied to the ESI samples included off-site fixed laboratory analysis of target analyte list (TAL) metals and grain size. Analyses applied to the samples are presented in Table 3-1.

The following samples were submitted to Contract Laboratory Program (CLP) and subcontract laboratories for analysis:

- **TAL Total Metals by EPA CLP Statement of for ISM01.2:** All samples, including QA/QC samples, were submitted for analysis to ALS Laboratory Group, a CLP laboratory located in Salt Lake City, Utah.

- **Grain Size by ASTM D-422:** All sediment samples were submitted for analysis to Analytical Resources, Inc., a subcontract laboratory located in Tukwila, Washington.

3.3 Viewing of Mine Sites

Two sites—the Dewey Mine and the Sonnemann Mine—were selected to be viewed during the ESI sampling event to determine their current conditions and whether they appear to be impacting adjacent streams. As stated earlier, Jordan Creek near the Dewey Mine became the subject of investigation during the ESI field event. For this reason, this mine and its features are discussed separately in Section 8.

The Sonnemann Mine is an inactive lead and silver mine. It once contained tailings that extended into Williams Creek, a tributary to Jordan Creek. A tailings sample collected during the IGS SI contained arsenic at 690 mg/kg, cadmium at 870 mg/kg, lead at 340 mg/kg, and zinc at 89,000 mg/kg. The tailings sample had toxicity characteristic leaching procedure results for arsenic of 2.9 mg/L, cadmium of 30 mg/L, chromium of 6.4 mg/L, and mercury of 0.018 mg/L indicating that heavy metals can leach from the tailings and migrate to other locations (IGS 2000).

A flowing adit also is present. A water sample collected from the adit during the IGS SI contained dissolved cadmium at 0.012 mg/L, dissolved zinc at 97 mg/L, total arsenic at 0.061 mg/L, total cadmium at 0.009 mg/L, total lead at 0.0032 mg/L, total mercury at 0.01 mg/L, and total zinc at 0.91 mg/L, indicating that this adit is a source of heavy metals contamination (IGS 2000).

Though not sampled during the IGS SI, a waste rock pile also was present. This pile was estimated to be 60 feet wide by 100 feet long by 60 feet deep (IGS 2000). This mine was the subject of a preliminary assessment (PA) completed by the IDEQ in 2002. During this PA, samples were collected of waste rock, water from the adit, and water from Williams Creek, including a background sample from the creek. Arsenic, cadmium, and lead contamination were determined to be present in waste rock, adit water, and Williams Creek. Tailings at the site were not sampled during the PA (IDEQ 2002).

In 2005, the Sonnemann Mine was the subject of an SI conducted by the IDEQ. During this investigation, samples were collected of tailings, adit water, seeps, waste rock, and Williams Creek surface water and sediments. From this sampling the primary environmental concerns were determined to be associated with the tailings and waste rock. A recommendation was made to remove these sources or install source controls and runoff water management systems (IDEQ 2005).

As a result of the IDEQ recommendation, owners of the mine undertook work to consolidate and cap waste rock and tailings (called South Mountain Mine in this report). Waste rock and tailings were moved into an area that had been cleared of vegetation and given a stable base. Once waste rock and tailings were placed in

this location, the area was capped with limestone, covered with native soil from a barrow area, and revegetated. Surface water drainage routes were constructed to convey water away from the repository (LFR, Inc. 2007).

During the ESI field event, the mine was viewed. The repository was seen to be in a similar condition to when it was constructed. Water from the Sonnemann adit was flowing at approximately 2 cubic feet per second (cfs). The water was seen to flow east over a steep embankment to a leveled area on the north end of the repository, then downslope again to Williams Creek. During the last known sampling of this adit (the 2005 IDEQ SI), the adit water contained arsenic at 0.037 mg/L, barium at 0.0047 mg/L, cadmium at 0.01 mg/L, copper at 0.0054 mg/L, and zinc at 0.882 mg/L, indicating that this adit is a source of heavy metals contamination (IDEQ 2005).

3.4 Global Positioning System

GPS coordinates were collecting using either a Trimble™ Geo XH handheld unit or a Trimble ProXR™ with TDC1 data logger. Recorded GPS coordinates by sample point are listed in Appendix D. The GPS coordinates obtained in the field for four samples (SP01SS, SP02SS, WC03SD, and TD03SD) were not sufficiently accurate to use in mapping. The positions of these samples were estimated from field knowledge of their locations relative to site features. The coordinates for these positions were obtained from GoogleEarth™.

3.5 Investigation-Derived Waste

IDW generated during the ESI sampling effort included disposable personal protective clothing and dedicated sampling equipment. IDW generated during field activities was rendered unusable by tearing (when appropriate), bagged in opaque plastic garbage bags, and disposed of at a local municipal landfill.

Table 3-1 Fixed Laboratory Sample Collection Summary

EPA Sample Number	Station	CLP Sample ID	Matrix	Depth (inches)	Sampler	Date	Time	TAL Metals	Grain Size	Location and Description
11384300	SP01SS	MJE994	Slag	0-6	AH	9/19/2011	2:00	X		South Mountain Smelter Slag. Black slag pieces intermixed with brown soil. Dry, no odor.
11384301	SP02SS	MJE995	Slag	0-6	AH	9/19/2011	2:10	X		South Mountain Smelter Slag. Black slag pieces intermixed with brown soil. Dry, no odor.
11384302	SP03SS	MJE996	Slag	0-6	AH	9/19/2011	2:20	X		South Mountain Smelter Slag. Crumbled black slag with very little soil. Dry, no odor.
11384303	BA01SS	MJE997	Ash	0-6	AH	9/19/2011	2:30	X		South Mountain Smelter Slag, burned material area. Fine powdered black ash. Dry, no odor.
11384304	BK01SS	MJE998	SS	0-6	AH	9/19/2011	2:35	X		South Mountain Smelter Slag, background area. Poorly sorted sandy, silty material with ~10% gravel. Dry, no odor. MS/MSD.
11384305	WC04SD	MJE999	SD	0-6	AH	9/19/2011	2:50	X	X	Williams Creek at South Mountain Smelter Slag, ~100 feet downstream of most downstream slag pile PPE. Dark brown, medium- to coarse-grained sand, well-sorted with some silts, ~5% clay. Wet, no odor.
11384306	WC03SD	MJE9A0	SD	0-6	AH	9/19/2011	3:10	X	X	Williams Creek at South Mountain Smelter Slag, at most downstream slag pile PPE. Dark brown, medium- to coarse-grained sand, well-sorted with some silts, ~5% clay. Wet, no odor.
11384307	WC02SD	MJE9A1	SD	0-6	AH	9/19/2011	1:25	X	X	Williams Creek at South Mountain Smelter Slag, at most upstream slag pile PPE. Dark brown, medium- to coarse-grained sand, well-sorted with some silts. Wet, no odor.
11384308	WC01SD	MJE9A2	SD	0-6	AH	9/19/2011	1:35	X	X	Williams Creek at South Mountain Smelter Slag, at background location. Dark brown, medium- to coarse-grained sand to silt, some gravel. Wet, no odor.
11384309	CC01SS	MJE9A3	SS	0-6	AH	9/20/2011	11:00	X		Unnamed gulch reddish tailings pile. Light reddish brown, coarse-grained sand and gravel. Dry, no odor.
11384310	CC02SS	MJE9A4	SS	0-6	AH	9/20/2011	11:20	X		Unnamed gulch reddish tailings pile. Light reddish brown, coarse-grained sand and gravel. Dry, no odor.
11384311	CC03SS	MJE9A5	SS	0-6	AH	9/20/2011	11:27	X		Unnamed gulch gray tailings pile. Light grayish brown, fine-grained sand with gravel. Dry, no odor.
11384312	BK02SS	MJE9A6	SS	0-6	AH	9/20/2011	11:37	X		Unnamed gulch background area. Light brown, fine-grained sand with gravel. Dry, no odor.
11384313	CC03SD	MJE9A7	SD	0-6	AH	9/20/2011	11:50	X	X	Unnamed gulch, ~20 feet upstream of Jordan Creek. Light brown sandy soil with some gravel. Dry, no odor.
11384314	CC02SD	MJE9A8	SD	0-6	AH	9/20/2011	12:05	X	X	Unnamed gulch at downstream end of lowest tailings pile. Light reddish brown, sand and gravel. Dry, no odor.
11384315	CC01SD	MJE9A9	SD	0-6	AH	9/20/2011	12:20	X	X	Unnamed gulch at background location on gulch ~30 feet above the tailings piles. Medium brown, sandy soil with gravel. Dry, no odor.

Table 3-1 Fixed Laboratory Sample Collection Summary

EPA Sample Number	Station	CLP Sample ID	Matrix	Depth (inches)	Sampler	Date	Time	TAL Metals	Grain Size	Location and Description
11384316	PT03SD	MJE9B0	SD	0-6	AH	9/20/2011	2:40	X	X	Long Gulch at Potosi Mine downstream of all waste rock. Medium reddish-brown, coarse sand and gravel. Wet, no odor.
11384317	PT02SD	MJE9B1	SD	0-6	AH	9/20/2011	2:55	X	X	Long Gulch at Potosi Mine at larger waste rock pile PPE. Medium brown, medium- to coarse-grained sand and silt Wet, no odor.
11384318	PT01SD	MJE9B2	SD	0-6	AH	9/20/2011	3:15	X	X	Long Gulch at Potosi Mine at background location on gulch upstream of waste rock piles. Medium reddish-brown, coarse-grained sand and gravel. Wet, no odor.
11384319	BK03SS	MJE9B3	SS	0-6	AH	9/20/2011	3:30	X		Potosi Mine background area. Gray-brown, sandy silt with some gravel. Dry, no odor.
11384320	PT01SS	MJE9B4	SS	0-6	AH	9/20/2011	3:40	X		Potosi Mine western waste rock pile. Gray, coarse sand and gravel. Dry, no odor.
11384321	PT02SS	MJE9B5	SS	0-6	AH	9/20/2011	3:55	X		Potosi Mine eastern waste rock pile. Light gray, medium- to fine-grained sand with gravel. Dry, no odor.
11384322	PT03SS	MJE9B6	SS	0-6	AH	9/20/2011	2:05	X		Potosi Mine eastern waste rock pile. Light gray, fine-grained sand. Dry, no odor.
11384323	TD01SD	MJE9B7	SD	0-6	AH	9/20/2011	5:45	X	X	Long Gulch at Trade Dollar Mine at background location on gulch upstream of tailings/waste rock pile. Reddish-brown, coarse-grained sand and gravel. Wet, no odor.
11384324	TD02SD	MJE9B8	SD	0-6	AH	9/20/2011	6:10	X	X	Long Gulch at Trade Dollar Mine from downstream end of tailings/waste rock pile. Reddish brown, coarse-grained sand and gravel. Wet, no odor.
11384325	TD01SS	MJE9B9	SS	0-6	AH	9/20/2011	6:20	X		Trade Dollar Mine tailings/waste rock. Gray, fine-grained sand and gravel. Dry, no odor.
11384326	BK04SS	MJE9C0	SS	0-6	AH	9/20/2011	6:30	X		Trade Dollar Mine at background location. Medium brown, sandy silt with gravel. Damp, no odor.
11384327	TD02SS	MJE9C1	SS	0-6	AH	9/20/2011	6:40	X		Trade Dollar Mine tailings/waste rock. Light brown, fine-grained sand with gravel. Dry, no odor.
11384328	TD03SS	MJE9C2	SS	0-6	AH	9/20/2011	6:45	X		Trade Dollar Mine tailings/waste rock. Light brown, fine-grained sand with gravel. Dry, no odor.
11384329	TD03SD	MJE9C3	SD	0-6	AH	9/20/2011	7:05	X	X	Long Gulch at Trade Dollar Mine downstream of mill area and tailings/waste rock pile. Reddish brown, coarse-grained sand and gravel. Dry, no odor. MS/MSD.
11384330	JC01SD	MJE9C4	SD	0-6	AH	9/21/2011	10:15	X	X	Jordan Creek background location. Medium brown, coarse-grained sand and gravel. Wet, no odor.
11384331	JC02SD	MJE9C5	SD	0-6	AH	9/21/2011	11:05	X	X	Jordan Creek ~10 feet downstream of Webfoot Gulch. Light reddish brown, coarse-grained sand and gravel. Wet, no odor.
11384332	JC03SD	MJE9C6	SD	0-6	AH	9/21/2011	11:30	X	X	Jordan Creek at Silver City campground. Light reddish brown, coarse-grained sand and gravel. Wet, no odor.

Table 3-1 Fixed Laboratory Sample Collection Summary

EPA Sample Number	Station	CLP Sample ID	Matrix	Depth (inches)	Sampler	Date	Time	TAL Metals	Grain Size	Location and Description
11384333	JC04SD	MJE9C7	SD	0-6	AH	9/21/2011	11:55	X	X	Jordan Creek ~5 feet upstream of road crossing near the Masonic Lodge. Light brown, coarse-grained sand and gravel. Wet, no odor.
11384334	DW01SR	MJE9C8	WT	0-0	AH	9/22/2011	9:20	X		Orton residence. Clear, no odor.
11384335	DW02SR	MJE9C9	WT	0-0	AH	9/22/2011	9:35	X		O'Malley residence. Clear, no odor. MS/MSD.
11384336	DW03SR	MJE9D0	WT	0-0	AH	9/22/2011	9:55	X		Idaho Hotel. Clear, no odor.
11384337	BK01SR	MJE9D1	WT	0-0	AH	9/22/2011	10:50	X		Background spring. Clear, no odor.
11384338	DM01SD	MJE9D2	SD	0-6	AH	9/22/2011	12:20	X	X	Jordan Creek at Dewey Mine near former mill. Medium brown, coarse-grained sand. Wet, no odor.
11384339	DM02SD	MJE9D3	SD	0-6	AH	9/22/2011	12:40	X	X	Jordan Creek at Dewey Mine. Reddish brown, coarse-grained sand and gravel. Wet, no odor.
11384340	DM03SD	MJE9D4	SD	0-6	AH	9/22/2011	1:05	X	X	Jordan Creek at Dewey Mine ~ 40 feet downstream of seeps. Grayish brown, coarse-grained sand. Wet, no odor.
11384341	DM01SP	MJE9D5	WT	0-0	AH	9/22/2011	1:20	X		Dewey Mine Seep. Clear, no odor.
11384342	DM02SP	MJE9D6	WT	0-0	AH	9/22/2011	1:25	X		Dewey Mine Seep. Clear, no odor.
11384343	DM04SD	MJE9D7	SD	0-6	AH	9/22/2011	1:45	X	X	Jordan Creek at Dewey Mine at background location on creek. Light brown, coarse-grained sand and gravel. Wet, no odor. MS/MSD.

Key:

AH = Ada Hamilton.
CLP = Contract Laboratory Program.
EPA = United States Environmental Protection Agency.
ID = Identification.
MS/MSD = Matrix spike/matrix spike duplicate.
NA = Not applicable.
PPE = Probable point of entry.
SD = Sediment.
SS = Surface soil.
TAL = Target Analyte List.
WT = Water.
X = The samples was analyzed for this parameter.

Table 3-2 Sample Coding

Digits	Description	Code	Example
1,2	Source Code	BA	Burned Area
		BK	Background
		CC	China Creek Area
		DM	Dewey Mine
		DW	Drinking Water Tap
		LG	Long Gulch and Tributaries
		JC	Jordan Creek
		PT	Potosi Mine
		SP	Slag Pile
		TD	Trade Dollar Mine
		WC	Williams Creek
		WP	Waste Pile
3,4	Consecutive Number	01	First number of source code
5,6	Matrix Code	SD	Sediment
		SP	Seep
		SR	Spring
		SS	Surface Soil

This page intentionally left blank.

4 Quality Assurance/ Quality Control

QA/QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware, and reagents. Specific QC requirements for laboratory analyses are incorporated in the *Contract Laboratory Program Statement of Work for Inorganic Analyses* (EPA 2010a). These QC requirements or equivalent requirements found in the analytical methods were followed for analytical work on the JCHMA SI. This section describes the QA/QC measures taken for this project and provides an evaluation of the usability of data presented in this report.

Data from the CLP laboratory were reviewed and validated by an EPA chemist. Data from the START-subcontracted commercial laboratory were reviewed and validated by a START chemist. Data qualifiers were applied as necessary, according to the following guidance:

- EPA (2010b) *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review.*

In the absence of other QC guidance, method- and/or standard operating procedure–specific QC limits were also utilized to apply qualifiers to the data.

4.1 Satisfaction of Data Quality Objectives

The following EPA (2000) guidance document was used to establish data quality objectives (DQOs) for this project:

- *Guidance for the Data Quality Objectives Process* (EPA QA/G-4), EPA/600/R-96/055.

The EPA TM determined that definitive data without error and bias determination would be used for the sampling and analyses conducted during the field activities. The data quality achieved during the field work produced sufficient data that met the DQOs stated in the SQAP (E & E 2011a). A detailed discussion of accomplished project objectives is presented in the following sections.

4.2 QA/QC Samples

Rinsate blank QA samples are only required for samples collected using non-dedicated sampling equipment and were not collected for this project. Trip blank QA samples are only required for volatile organic compound analyses and were not collected for this project. QC samples included matrix spike/matrix spike duplicate (MS/MSD) and/or blank spike (BS) samples at a rate of one MS/MSD and/or BS per 20 samples per matrix.

4.3 Project-Specific Data Quality Objectives

The laboratory data were reviewed to ensure that DQOs for the project were met. The following sections describe the laboratories' abilities to meet project DQOs for precision, accuracy, and completeness and the field team's ability to meet project DQOs for representativeness and comparability. The laboratories and the field team were able to meet DQOs for this project.

4.3.1 Precision

Precision measures the reproducibility of sampling and analytical methodology. Laboratory and field precision is defined as the relative percent difference between duplicate sample analyses. The laboratory duplicate samples or MS/MSD samples measure the precision of the analytical method. The relative percent difference values were reviewed for all fixed laboratory samples. A total of 108 sample results (approximately 7.8 percent of the data) were qualified based on precision outliers; therefore, the project DQO for precision of 90 percent was met.

4.3.2 Accuracy

Accuracy indicates the conformity of measurements to fact. Laboratory accuracy is defined as the MS/MSD/BS percent recoveries for all laboratory analyses. A total of 56 sample results (approximately 4 percent of the data) were qualified based on accuracy outliers; therefore, the project DQO for accuracy of 90 percent was met.

4.3.3 Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). All laboratory data were reviewed for data validation and usability. No sample results were rejected; therefore, the project DQO for completeness of 90 percent was met.

4.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were determined in the field to account accurately for site variations and sample matrices. The DQO for representativeness of 90 percent was met.

4.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this site followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability of 90 percent was met.

4.4 Laboratory QA/QC Parameters

The laboratory data also were reviewed for holding times/temperatures/sample containers, laboratory blank samples, and serial dilution analyses. These QA/QC parameters are summarized below.

4.4.1 Holding Times/Temperatures/Sample Containers

All holding times, sample temperatures, and containers were acceptable.

4.4.2 Laboratory Blanks

All laboratory blanks met the frequency criteria. The following potential contaminants of concern were detected in the laboratory blanks:

- Inorganics: Antimony, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, manganese, mercury, nickel, selenium, silver, sodium, thallium, vanadium, and zinc.

See the data validation memoranda for results qualified based on blank contamination (Appendix C).

4.4.3 Serial Dilution Analyses

Serial dilution analyses met the frequency criteria. A total of six sample results (approximately 0.4 percent of the data) were qualified based on serial dilution outliers.

This page intentionally left blank.

5 Analytical Results Reporting and Definition of the Surface Water Migration Pathway

This section describes the reporting methods applied to analytical results presented in this ESI and defines the surface water migration pathway for this ESI.

5.1 Analytical Results Evaluation Criteria

Analytical results presented in the summary tables included at the end of each site-specific section show all analytes detected above laboratory detection limits in bold type. Analytical results indicating significant/elevated concentrations of contaminants in source samples and target samples (i.e., stream beds and drinking water taps) with respect to background concentrations are shown underlined and in bold type. For the purposes of this investigation, significant/elevated concentrations are those concentrations that are:

- Equal to or greater than the sample's Contract Required Quantitation Limit or the Sample Quantitation Limit when a non-CLP laboratory was used; and
- Equal to or greater than the background sample's Contract Required Quantitation Limit or Sample Quantitation Limit when the background concentration was below detection limits; or
- At least three times greater than the background concentration when the background concentration equals or exceeds the detection limits.

The analytical summary tables present all detected compounds, but only analytes detected at potential sources and targets meeting the significant/elevated concentration criteria are discussed in the report text.

The analytes aluminum, calcium, iron, magnesium, potassium, and sodium are common earth crust elements. Based on EPA, Region 10 policy, these common earth crust elements will not be discussed in this report.

5.2 Surface Water Migration Pathway Definition

The surface water migration pathway target distance limit (TDL) begins at the probable points of entry (PPEs) of surface water runoff from a site to a surface water body and extends downstream for 15 miles. The PPEs and 15-mile TDLs have been determined for each mine site included in this ESI. These are discussed with their corresponding mines in the following sections. The surface water bodies that occur within the 15-mile TDLs of the mine sites included in this

report are not known to be used for drinking water purposes. Further, no threatened, endangered, or candidate species are known to occur within these 15-mile TDLs (USFWS and IFWO 2011). Redband trout (*oncorhynchus mykiss*) are native to all major river drainages in Southwestern Idaho. Within this large and diverse geographical area, redband trout have adapted to a variety of stream habitats including those of mountain and desert areas. In 1995, those redband trout that reside in desert locales were petitioned for listing under the Federal Endangered Species Act, under the assumption that they could be considered a separate sub-species. The petition was denied (IDFG 2010).

Jordan Creek and its tributaries are open to sport fishing throughout the year (IDFG 2012). Fishing is known to occur within the 15-mile TDLs of each mine site as are wetlands. These target receptors are discussed with their corresponding mines in the following sections.

6 Potosi Mine

Potosi Mine (also called Silver City Mine) is a former gold and silver mine located in Silver City near the mouth of Long Gulch, a tributary of Jordan Creek (Figure 6-1). The site is accessible from a dirt road that diverges from Jordan Creek Road at the south end of town.

Features at the site include a former stamp mill; a dry collapsed shaft; a dry, open adit; and two waste rock piles (Figure 6-1). The shaft is fenced, and the adit opening is framed with a 3-foot barred, corrugated pipe (Photograph 1). These protections are new developments since IGS visited the mine in 2000. At that time, the shaft was described as being only partially surrounded by a few strands of barbed wire, and the adit was described as open. Both were considered safety hazards (IGS 2000).

The larger waste rock pile measures approximately 50 feet wide by 165 feet long by 50 feet deep and is near the stamp mill, shaft, and adit. The second waste rock pile is approximately 20 percent this size and is located several hundred feet upstream. Both piles extend into Long Gulch.

PPEs at the site include locations where waste rock is in contact with Long Gulch. Long Gulch, at the base of the waste rock piles, is somewhat braided and has an estimated flow rate of 5 cfs. From this location, Long Gulch flows approximately 0.24 miles to its confluence with Jordan Creek. Jordan Creek has an estimated flow rate of 10 cfs at this confluence. The remainder of the 15-mile TDL is contained within Jordan Creek (Figure 6-2). Livestock make use of Long Gulch for watering. Fishing is known to occur on Long Gulch and Jordan Creek wherever deep pools of water exist (Nelson 2011a). No such pools were observed adjacent to the Potosi Mine, but several occur in Jordan Creek within the 15-mile TDL. The PPEs are in a palustrine scrub/shrub seasonally flooded (PSSC) wetland. Approximately 0.24 mile of wetland frontage is present on Long Gulch, and approximately 2.57 miles of wetland frontage is present on Jordan Creek within the 15-mile TDL (Hanson 2011).

6.1 Geologic Features

The IGS SI states:

> *The vein here lies in granite, but continues in the overlying basalt, in which, however, only a few bunches of ore were found. Nearly the whole of the production comes from the granite. The mine is developed by a tunnel and a shaft 300 feet deep located at the mouth of the tunnel. The*

vein is from 6 to 12 inches wide. The ore contains principally silver, with relatively little gold. (IGS 2000)

6.2 Site Ownership

The mine, including its waste rock piles, is located entirely on BLM land (BLM 2010a). It appears this mine has never been privately owned.

6.3 Site History

The IGS SI states that reference documents indicate the Potosi Mine was chiefly worked from 1875 to 1877 and that developments continued on it at various other times on a small scale. In 1869, production of the mine was reported to be 160 tons, containing $38 per ton. In 1885, production was reported to be 11 ounces of gold and 2,000 ounces of silver, though the mine had not been worked during the last few years (IGS 2000).

In 2005, a person who had visited Potosi Mine with her father when she was a child wrote that she saw a wash tub full of mercury at the site (Hyslop 2006).

6.4 Previous Mine Sampling

No known sampling has been conducted at the mine. A sediment sample was collected from Long Gulch below the mine during the EPA SI. Based on XRF analysis, the sample contained concentrations of arsenic at 28 mg/kg, copper at 90 mg/kg, lead at 256 mg/kg, mercury at 7.9 mg/kg, silver at 9 mg/kg, and zinc at 311 mg/kg, indicating the stream may be impacted (E & E 1999).

6.5 ESI Sampling

Both waste rock piles were sampled during the ESI field event, as were Long Gulch stream sediments. Figure 6-3 illustrates these sample locations and corresponding mercury concentrations.

6.5.1 Waste Rock Samples

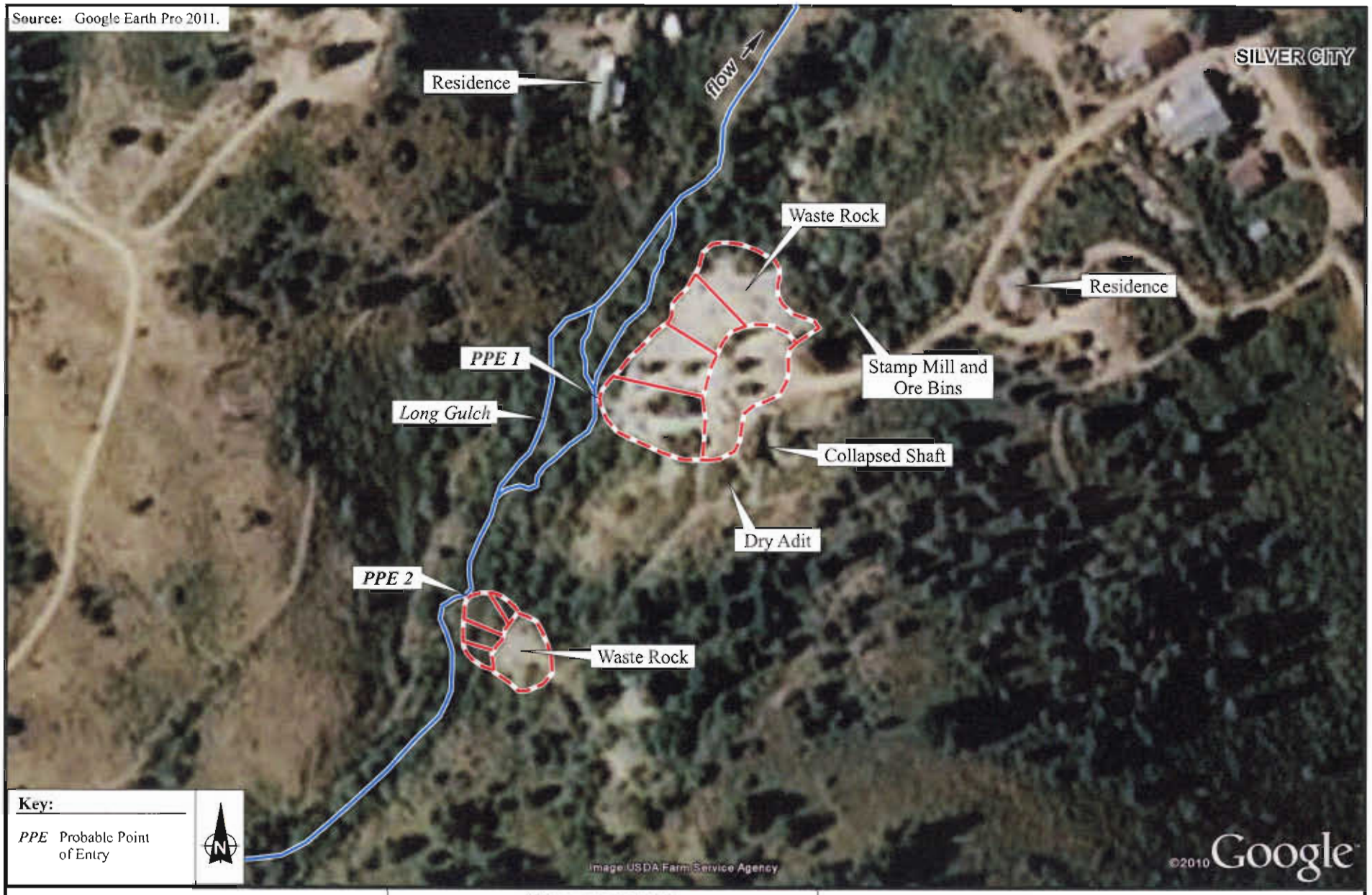
Three waste rock samples (PT01SS, PT02SS, and PT03SS) were collected from the waste rock piles at the mine. PT01SS was collected near the toe of the smaller waste rock pile, while PT02SS and PT03SS were collected near the toe of the larger waste rock pile. All waste rock samples were collected from runoff erosion routes. A background sample (BK03SS) of country rock was collected upstream of the mine for comparison to the Potosi Mine waste rock samples.

Sample results are presented in Table 6-1 and indicate the presence of silver at a significant concentration with respect to the background concentration in sample PT03SS. No other metals were detected at significant concentrations in waste rock samples; however, some metals concentrations in the background sample were fairly high. Mercury was detected in all samples, including the background sample, at concentrations ranging from 0.13 to 2.5 mg/kg. The highest concentration of mercury was in the background sample. The source of mercury in this sample is not known.

6.5.2 Sediment Samples

Three sediment samples (PT01SD, PT02SD, and PT03SD) were collected from Long Gulch. PT03SD was collected at the downstream terminus of the site. This sample was collected near, but upstream of, residences near the stream to ensure it was not influenced by these residences. Sample PT02SD was collected near the downstream end of the larger waste rock pile. Sample PT01SD was collected upstream of all site features as a background sample.

Sample results, presented in Table 6-2, indicate the presence of lead and silver at elevated concentrations with respect to background concentrations in sample PT02SD, though lead was not likewise detected at significant concentrations in the waste rock samples. No metals were detected at elevated concentrations in sample PT03SD. Mercury was detected in all sediment samples, including the background sample, at concentrations ranging from 2.1 to 13.3 mg/kg. The source of mercury in the background sample is not known.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 75 150
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 6-1
POTOSI MINE SITE MAP

Date:	Drawn by:	
12/13/11	AES	10:START-3\10010006\fig 6-1

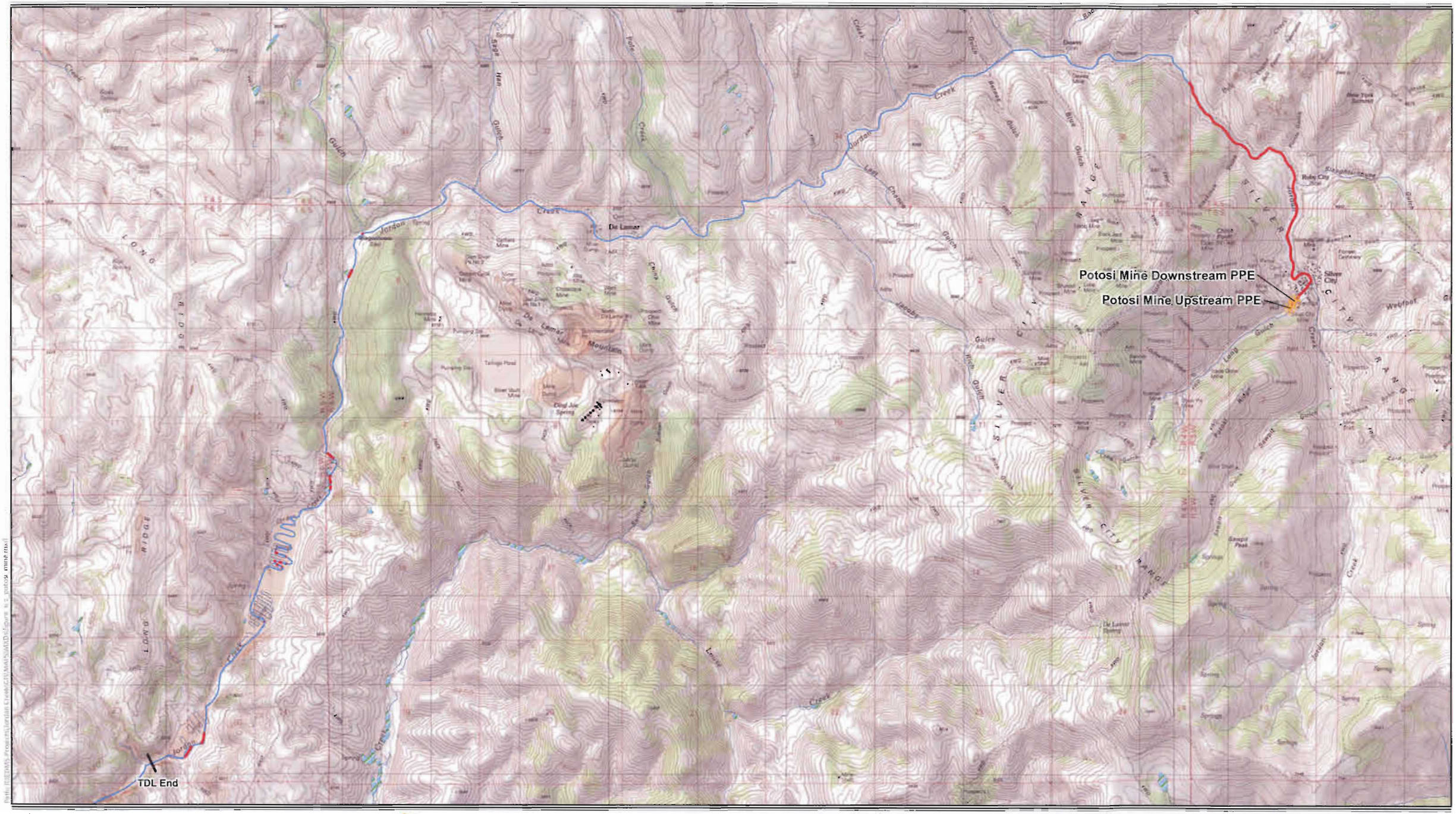
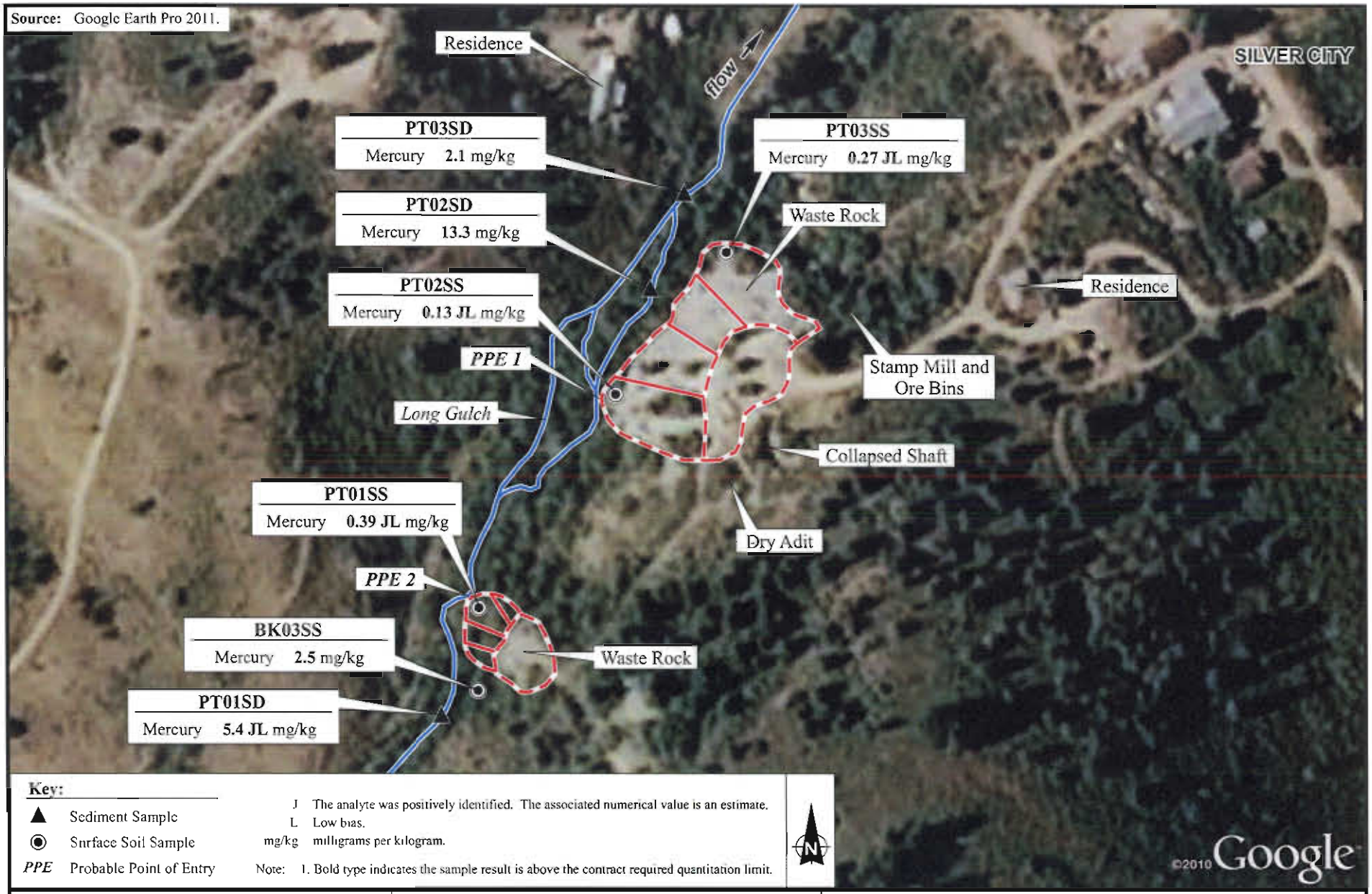


Figure 6-2
Potosi Mine
15-Mile Target Distance Limit Map

Southwest Idaho



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 75 150
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 6-3
POTOSI MINE SAMPLE LOCATIONS AND MERCURY RESULTS

Date: 12/13/11

Drawn by: AES

10:START-3\10010006\fig 6-3

Table 6-1 Potosi Mine Waste Rock Samples Analytical Results Summary

EPA Sample ID	11384319	11384320	11384321	11384322
CLP Sample ID	MJE9B3	MJE9B4	MJE9B5	MJE9B6
Station Location ID	BK03SS	PT01SS	PT02SS	PT03SS
Description	Background	Potosi Mine Waste Rock		
TAL Metals (mg/kg)				
Aluminum	**52000**	**16900**	**3280**	**3130**
Arsenic	**18.6**	**14.5 JH**	**1.2 JH**	**8.1 JH**
Barium	**297**	18.9 UJK	18.6 UJK	18 UJK
Beryllium	**1.5**	0.47 U	0.47 U	0.45 U
Cadmium	**1.9**	**0.61**	0.19 JQ	0.18 JQ
Calcium	**15700**	**14800 JK**	**3350 JK**	**1620 JK**
Chromium	**54.8**	**33.8 JK**	0.93 UJK	0.9 UJK
Cobalt	**45.1**	**28**	0.53 JQ	0.52 JQ
Copper	**75.9**	**159**	**25.4**	**51.7**
Iron	**74400**	**34700**	**3160**	**4010**
Lead	**38.7**	**4.9 JH**	**10.5 JH**	**22.1 JH**
Magnesium	**17300**	**7650 JK**	**663 JK**	**705 JK**
Manganese	**2070**	**692**	**99.4**	**140**
Mercury	**2.5**	**0.39 JL**	**0.13 JL**	**0.27 JL**
Nickel	**82.1**	**53.4 JK**	3.7 UJK	3.6 UJK
Potassium	**5760**	**549**	**946**	**1020**
Silver	**2.2**	**3.1**	**1.6**	**10.4**
Vanadium	**146**	**65.9 JK**	4.7 UJK	4.5 UJK
Zinc	**247**	**67.9**	**35.2**	**45**

Note: Bold type indicates the sample result is above the contract required quantitation limit.
Underline type indicates the sample result is significant as defined in Section 5.

Key:

CLP = Contract Laboratory Program.
CRQL = Contract Required Quantitiation Limit.
EPA = United States Environmental Protection Agency.
H = High bias.
ID = Identification.
J = The analyte was positively identified. The associated numerical value is an estimate.
K = Unknown bias.
L = Low bias.
mg/kg = milligrams per kilogram.
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL.
TAL = Target analyte list.
U = The analyte was not detected at or above the associated value.

Table 6-2 Potosi Mine Sediment Samples Analytical Results Summary

EPA Sample ID	11384318	11384317	11384316
CLP Sample ID	MJE9B2	MJE9B1	MJE9B0
Station Location ID	PT01SD	PT02SD	PT03SD
Description	Background	Long Gulch	
TAL Metals (mg/kg)			
Aluminum	13300	13600	15400
Arsenic	24.6 JH	27.9	15
Barium	131 JK	164	115
Beryllium	1.3	1.3	0.56
Cadmium	0.62	0.72	0.49 U
Calcium	3410 JK	3150	3670
Chromium	11.2 JK	10.6	23.7
Cobalt	13.4	15.5	22.5
Copper	23.6	27.1	68.5
Iron	29700	29800	36400
Lead	14.7 JH	81.7	7.2
Magnesium	3600 JK	3160	4480
Manganese	613	804	835
Mercury	5.4 JL	13.3	2.1
Nickel	15.2 JK	17.4	52.3
Potassium	1350	1500	809
Silver	1.5	4.8	0.99 U
Vanadium	41.7 JK	43.9	68.2
Zinc	145	146	96.3
Grain Size (Percent Retained)			
Percent passing < 3.2 micron sieve	1.6	3.8	0.4
3.2 micron sieve	0.1	3.4	0.4
7 micron sieve	1.4	0.4	0.4
9 micron sieve	0.3	1.5	0.2
13 micron sieve	0.5	1.9	0.1
22 micron sieve	0.5	1.9	0.5
32 micron sieve	0.2	4.1	0.1
75 micron sieve	1.2	4.9	0.5
150 micron sieve	1.5	10.1	1.3
250 micron sieve	4	25.9	4.9
425 micron sieve	13.6	24.9	13.9
850 micron sieve	32.2	6.8	22.8
2000 micron sieve	27.9	2.2	26
4750 micron sieve	9.6	4.9	20.7
9500 micron sieve	4	1.1	5.5
12500 micron sieve	1.6	2.1	2.5
19000 micron sieve	0.1	0.1	0.1
25000 micron sieve	0.1	0.1	0.1
37500 micron sieve	0.1	0.1	0.1
50000 micron sieve	0.1	0.1	0.1
75000 micron sieve	0.1	0.1	0.1

Note:

Bold type indicates the sample result is above the contract required quantitation limit.

Underline type indicates the sample result is elevated as defined in Section 5

Key

CLP = Contract Laboratory Program.
CRQL = Contract Required Quantitation Limit.
EPA = United States Environmental Protection Agency
H = High bias.
ID = Identification
J = The analyte was positively identified. The associated numerical value is an estimate.
K = Unknown bias.
L = Low bias.
mg/kg = milligrams per kilogram
TAL = Target analyte list
U = The analyte was not detected at or above the associated value

This page intentionally left blank.

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 1 Dry adit.

Direction: South *Date: 9/20/11* *Time: 14:20*



Photo 2 Sample PT03SD from downstream of waste rock piles in Long Gulch.

Direction: Down *Date: 9/20/11* *Time: 14:44*



Photo 3 Sample PT02SD from braided section of Long Gulch.

Direction: Down *Date: 9/20/11* *Time: 14:59*



Photo 4 Waste rock toeing into braided section of Long Gulch.

Direction: East *Date: 9/20/11* *Time: 15:03*



Photo 5 Sample PT01SD from upstream of braiding on Long Gulch. Background location.

Direction: Down *Date: 9/20/11* *Time: 15:20*



Photo 6 Sample BK03SS from west of Potosi waste rock piles.

Direction: Down *Date: 9/20/11* *Time: 15:34*



Photo 7 Sample PT01SS from western waste rock pile.

Direction: Down *Date: 9/20/11* *Time: 15:44*



Photo 8 Western waste rock pile toeing out into a braided dry stream bed of Long Gulch.

Direction: West *Date: 9/20/11* *Time: 15:48*

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 9 Sample PT02SS from eastern waste rock pile.

Direction: North *Date: 9/20/11* *Time: 15:56*



Photo 10 Sample PT03SS from eastern waste rock pile.

Direction: North *Date: 9/20/11* *Time: 16:10*



Photo 11 View of Potosi Mine from across Long Gulch. Both waste rock piles are in view.

Direction: South *Date: 9/20/11* *Time: 19:26*

This page intentionally left blank.

7 Trade Dollar Mine

Trade Dollar Mine is a former gold and silver mine located west of Silver City on the south slope of Florida Mountain. The mine is upslope of Long Gulch, a tributary of Jordan Creek. The site is accessible from a severely rutted dirt road that follows Long Gulch upstream from Silver City. The road is passable with an all-terrain vehicle (Figure 7-1).

Features at the site include a collapsed mill building (formerly known as the Blaine Mill); three out-of-use standing buildings; a dry, open tunnel called the Blaine Tunnel; a collapsed structure near the Blaine Tunnel; one large pile containing both tailings and waste rock; and one small waste rock pile near the former mill building (Figure 7-1). Another large waste rock pile is located upslope of the mine in Leviathan Gulch, a tributary to Long Gulch. This waste rock pile was at an elevation of approximately 150 feet above the access road and appeared to be associated with a different mining operation; possibly the Stone Cabin Mine located on top of Florida Mountain. Leviathan Gulch was dry at the time of the ESI field event and is interrupted prior to reaching Long Gulch by the large tailing/waste rock pile of Trade Dollar Mine.

The tailings/waste rock pile measures approximately 600 feet long with a varying width that ranges up to approximately 185 feet. The pile extends downslope to the stream bed of Long Gulch approximately 30 feet below the top of the pile. The face of the tailings/waste rock pile is steep, with an estimated slope of 45 degrees.

The small waste rock pile is located upslope of the collapsed mill building and is not in contact with Long Gulch. The pile measures approximately 50 by 35 feet.

PPEs at the site include locations where tailings/waste rock is in contact with Long Gulch. Long Gulch has an estimated flow rate of 5 cfs. From this location, Long Gulch flows approximately 0.91 miles to its confluence with Jordan Creek. Jordan Creek has an estimated flow rate of 10 cfs at this confluence. The remainder of the 15-mile TDL is contained within Jordan Creek (Figure 7-2). Livestock make use of Long Gulch for watering. Fishing is known to occur on Long Gulch and Jordan Creek wherever deep pools of water exist (Nelson 2011a). No such pools were observed adjacent to the Trade Dollar Mine, but several occur in Jordan Creek within the 15-mile TDL. The PPEs are located in a PSSC wetland. Approximately 0.91 miles of wetland frontage is present on Long Gulch, and approximately 2.4 miles of wetland frontage is present on Jordan Creek within the 15-mile TDL (Hanson 2011).

7.1 Geologic Features

The ore minerals at the Trade Dollar Mine were found to consist essentially of silver sulphides, chalcopyrite, and traces of galena, all of which were rich in gold and silver. The silver ore came almost entirely in the form of argentite. The gold was in fine-textured chalcopyrite (Mitchell 2010).

7.2 Ownership/Operator History

The majority of the mine is located on BLM land, though the collapsed mill building and the small waste rock pile are on the patented mining claim of the Sharon and Richard Fewkes Trust (Endicott 2011; BLM 2010a). Figure 7-3 shows current ownership boundaries.

The person responsible for discovering the mine is not known. The earliest known operator is the Trade Dollar Mining and Milling Company, which began work at the mine in 1891. In 1899, the company purchased the Black Jack Mine (located on top of Florida Mountain) and changed its name to the Trade Dollar Consolidated Mining Company. This entity continued operating the mine until 1910, then changed its company name to the Swan Falls Power Company in 1911. In 1915, some leases were operated in the upper levels of the Trade Dollar Mine. The company sold the Blaine Mill to the Silver City Mining Company, which operated on an adjacent vein. Lessees operated the Trade Dollar Mine in 1915 and 1916. Florida Mountain Mines Company took over the property ownership in 1917. In 1921, the mine was leased to Robert J. Goodwin. In 1922, the property apparently was sold in a sheriff's sale. In 1923, Empire Mines Company took over the mine ownership and leased out some claims. In 1926, the Hoosier Leasing Company worked some claims leased from the Empire Mines Company through the Blaine Tunnel. In 1928, the Empire Mines Company leased some of the lower level claims to the Trade Dollar Leasing Company. In 1929, the mine was sold to Jim Daly of Nampa, Idaho, for back taxes. In late 1934, Western Mines, Ltd. (later incorporated as Goldsil Mines, Inc.) purchased the Trade Dollar Mine; however, the company forfeited its corporate charter in 1936 without completing the purchase of the mine. By 1954, Brunzell and Williams had taken possession of the mine, though the date of purchase is not known. Table 7-1 presents the ownership/operator history of the mine to 1954 (Mitchell 2010).

7.3 Site History

Trade Dollar Mining and Milling Company began work at the mine in 1891. By mid-April, the mine had two tunnels driven into the ore vein that were 70 vertical feet apart. The lower tunnel came to be known as the Blaine Tunnel. By June, sufficient ore was being produced to keep the Blaine Mill running steadily. By July, the company employed 80 men at the mine and mill, and in later years up to 300 workers were employed. A covered tramway was constructed to convey ore from the mine to the mill. A two-spigot V-shaped box classifier was used in the mill to separate the heavy pulp (a mixture of ground ore and water capable of flowing like a fluid) from the lighter pulp, with each grade flowing onto different

vanners (a type of ore classifier, or separator). The ore throughout the mine was of high grade (Mitchell 2010).

Near the end of 1896, the Blaine tunnel was successfully connected to the Idaho tunnel, which was dug by a different mining operation working mines known as the Black Jack Group on the north slope of Florida Mountain. This created an open north/south trending tunnel completely through Florida Mountain from Jordan Creek on the north side to Blaine Gulch on the south side at a depth of 1,200 feet (Mitchell 2010).

By May 1898, the Trade Dollar Mine included 5 miles of tunnels. Mill equipment included a Blake crusher, 10 950-pound, quick-drop stamps, four Frue vanners, and six Fraser & Chalmers amalgam pans (Mitchell 2010).

By 1900, the Trade Dollar Consolidated Mining Company had combined operations at the Trade Dollar Mine with those of the Black Jack and Booneville Mines on Florida Mountain, which it also owned. The three mines were worked entirely through tunnels, all of which were connected underground and were on the same vein system. The organization also owned the Dewey Mine and Mill, located on the north slope of Florida Mountain. By 1903, all of the ore from these mines was brought out of the Florida Mountain tunnel on the north side of Florida Mountain and dumped directly into the 20-stamp Dewey Mill (Mitchell 2010).

In approximately 1915, the Blaine Mill was sold to the Silver City Mining Company, which operated on an adjacent vein. At about this time, the mill was remodeled as a 25-ton per day cyanide mill to increase gold and silver recovery. Some of the ore from the Trade Dollar Mine was handled through this mill (Mitchell 2010).

7.4 Previous Mine Sampling

In 1973, the Trade Dollar Mill was sampled as a part of the study of mercury contamination in the Jordan Creek drainage by a geology student of the University of Idaho. Five soil samples contained mercury above the detection limit of 0.1 ppm. Mercury concentrations in these samples ranged from 21.4 to 174 ppm (i.e., mg/kg) (Hill 1973).

7.5 ESI Sampling

The tailings pile was sampled during the ESI field event, as were Long Gulch stream sediments. Figure 7-4 illustrates these sample locations and corresponding mercury concentrations.

7.5.1 Tailings/Waste Rock Samples

Three samples (TD01SS, TD02SS, and TD03SS) were collected from the tailings/waste rock pile at the mine. These samples were collected from runoff erosion routes. A background sample (BK04SS) of country rock was collected on

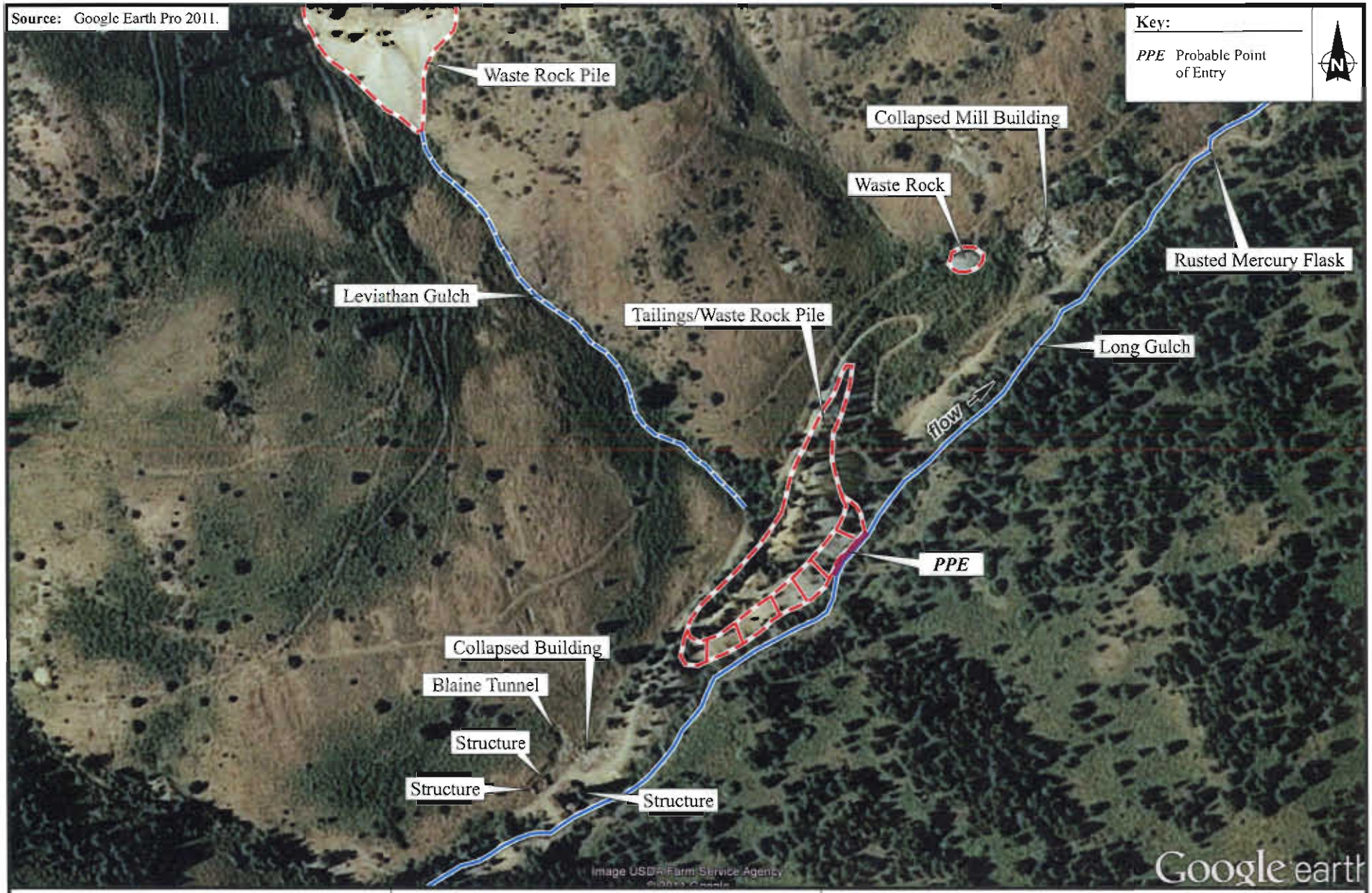
the opposite side of Long Gulch from the mine for comparison to the Trade Dollar Mine tailings samples.

Sample results are presented in Table 7-2 and indicate the presence of mercury and silver at significant concentrations with respect to background concentrations in all three samples. Mercury concentrations ranged from 0.33 to 0.5 mg/kg, while silver concentrations ranged from 8.3 to 72.7 mg/kg.

7.5.2 Sediment Samples

Three sediment samples (TD01SD, TD02SD, and TD03SD) were collected from Long Gulch. TD03SD was collected downstream of all mine-related features. This sample was collected near, but upstream of, the location where the dirt access road crosses Long Gulch. A rusted mercury flask was observed in Long Gulch downstream of this road crossing (Photograph 12). The flask was left undisturbed. It is not known whether mercury is present in the flask. Sample TD02SD was collected near the downstream side of the tailings/waste rock pile. Sample TD01SD was collected upstream of all site features as a background sample.

Sample results are presented in Table 7-3 and indicate the presence of mercury at elevated concentrations with respect to background concentrations in both downstream sediment samples at concentrations of 0.16 and 1.5 mg/kg. Silver was elevated with respect to background concentrations in one sample at 1.5 mg/kg. In addition, beryllium, cadmium, chromium, cobalt, copper, manganese, nickel, vanadium, and zinc were detected at elevated concentrations with respect to background concentrations; however, these metals were not likewise present at significant concentrations in the tailings/waste rock samples collected at the Trade Dollar Mine. For this reason, impacts to Long Gulch from these analytes are not considered attributable to this mine.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

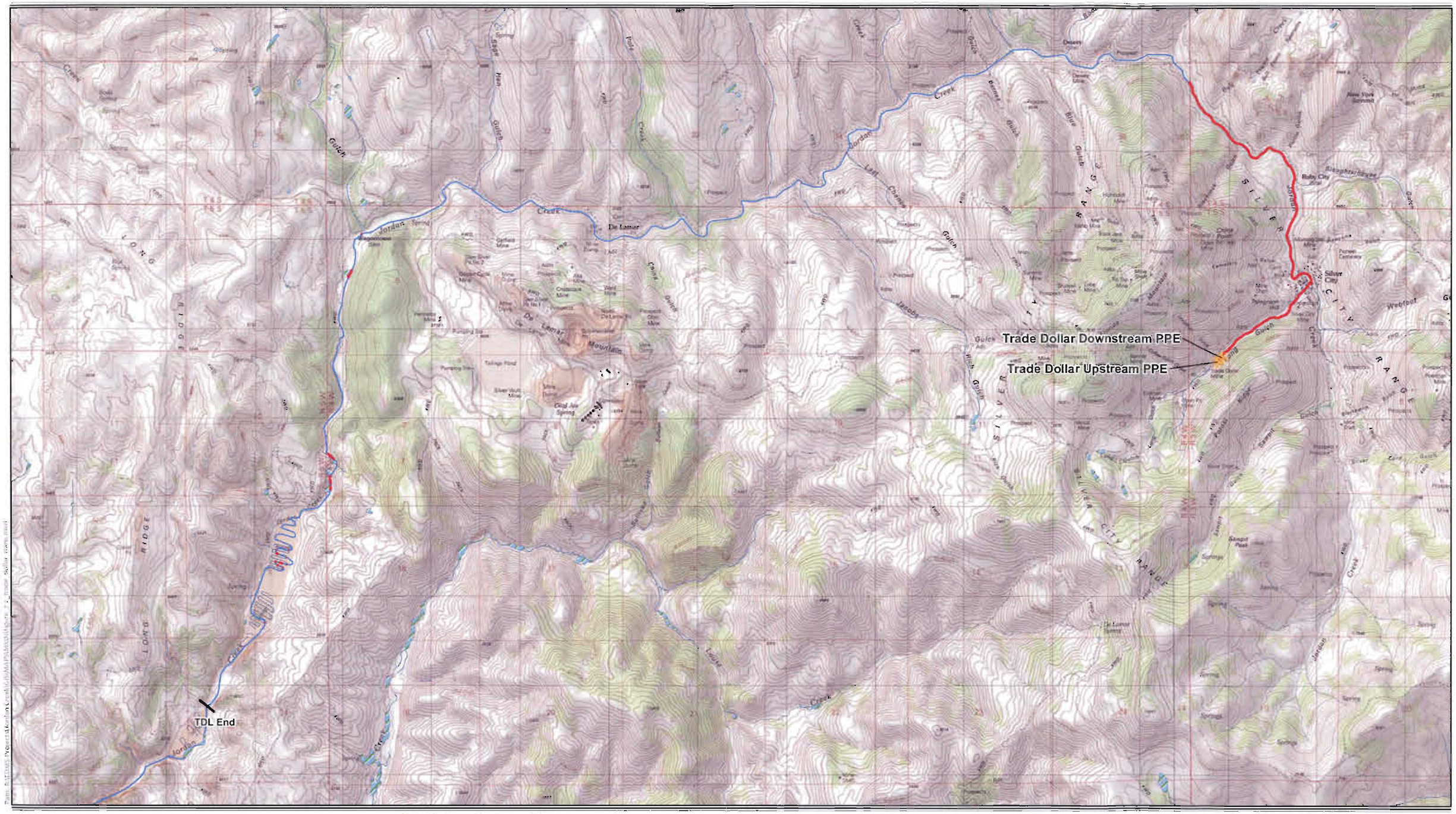
Figure 7-1
TRADE DOLLAR MINE SITE MAP

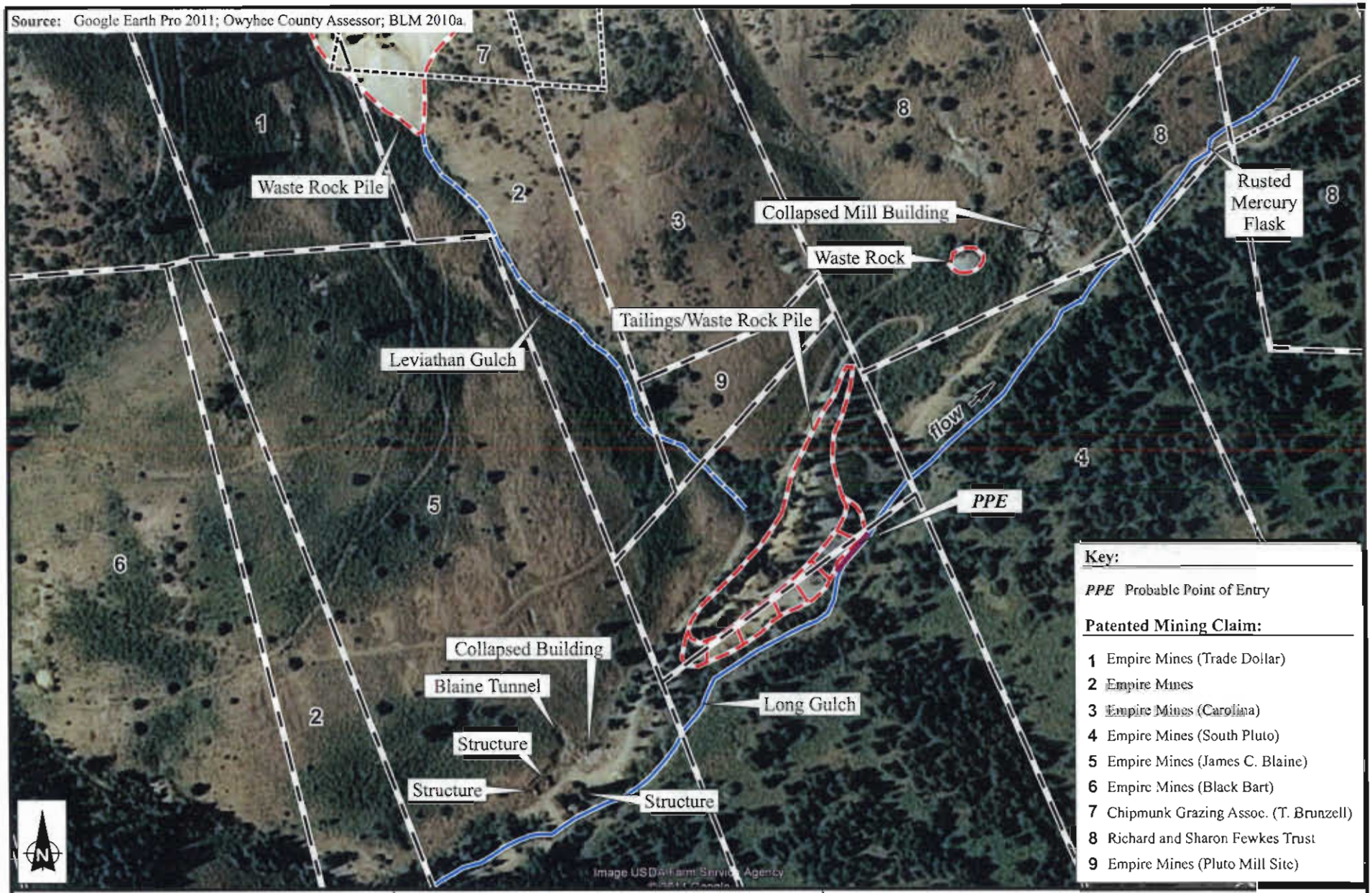
0 135 270
Approximate Scale in Feet

Note: Some features are not to scale.

Date:	Drawn by:	
12/13/11	AES	10:START-3\10010006\fig 7-1

This page intentionally left blank.


Trade Dollar Downstream PPE
Trade Dollar Upstream PPE
TDL End
De Lamar
Jordan Creek
Jacobs Gulch
Wilson Gulch
Hatch Gulch
Ruby City
Silver City
Weefoot
Alpine York Summit
Sampson Peak
Sawpit Peak
Jordan Spring
Jordan Creek
Jordan Creek
Jordan Creek



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

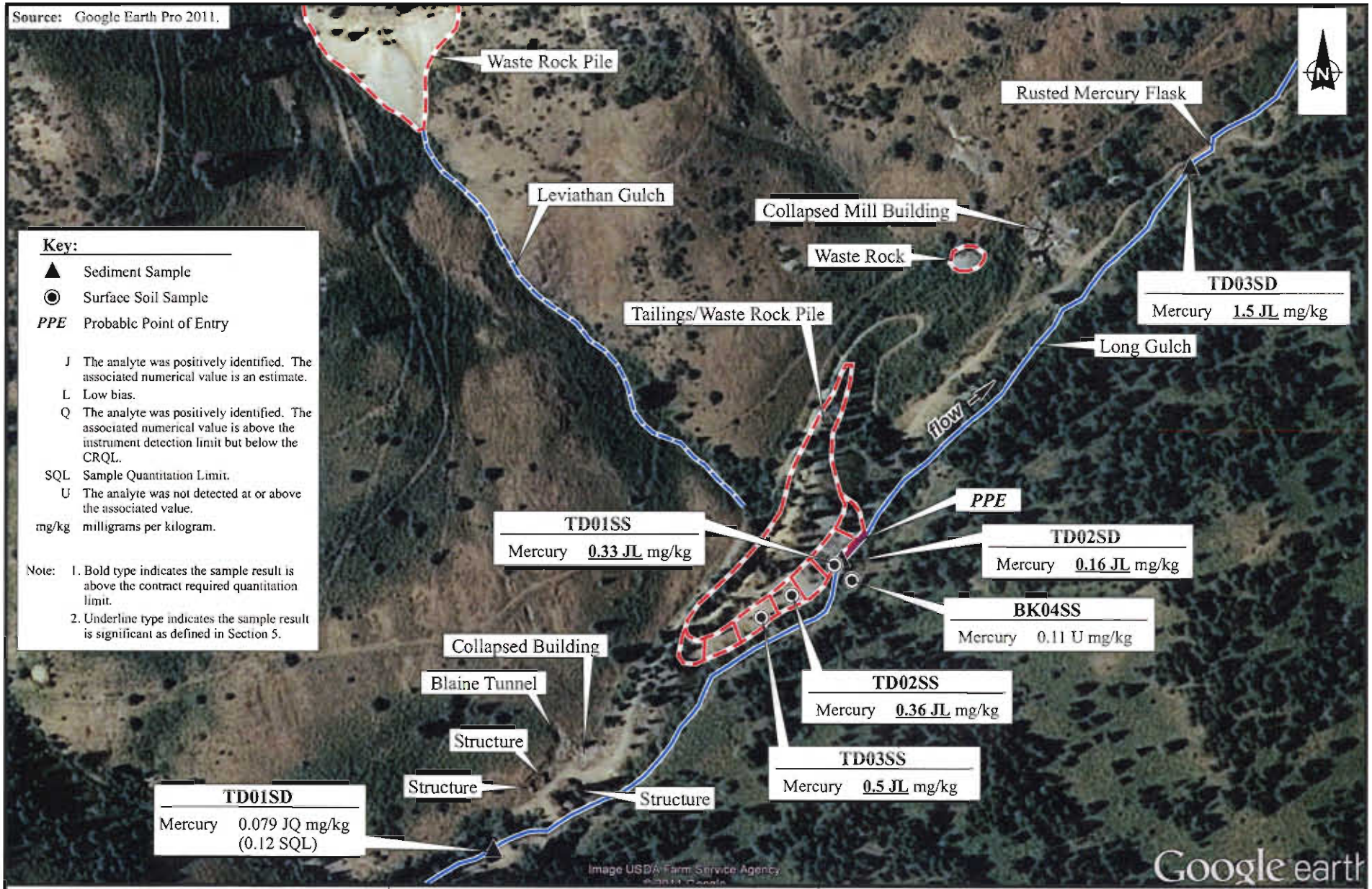
JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 135 270
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 7-3
TRADE DOLLAR MINE OWNERSHIP MAP

Date: 12/21/11 | Drawn by: AES | 10:START-3\10010006\fig 7-3



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 135 270
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 7-4
TRADE DOLLAR MINE SAMPLE LOCATIONS AND MERCURY RESULTS

Date: 4/10/12 | Drawn by: AES | 10:START-3\10010006\fig 7-4

Table 7-1 Trade Dollar Mine Ownership/Operater History

Company Name	Officer	Date Incorporated	Charter Forfeited	Year(s) of Operation
Unknown discoverer	--	--	--	--
Unknown owners	--	--	--	? to 1891
Trade Dollar Mine and Milling Company	James Hutchinson, superintendent	12/31/1894	1899	1891 to 1899
Trade Dollar Consolidated Mining Company	James Hutchinson, superintendent	1899	1/2/1911	1899 to 1911
Swan Falls Power Company	Frederic Irwin, superintendent	1/2/1911	1/14/1920	1911 to 1917
Florida Mountain Mines Company	M.A. Isaacs, president	3/25/1918	12/1/1921	1917 to 1923?
Robert J. Goodwin (lessee)	--	--	--	1921?
Empire Mines Company	Peter Steele, president/manager	9/15/1923	7/20/2009	1923 to ?
Unknown lessees	--	--	--	1923 to 1926
Hoosier Leasing Company	Charles A. Hackney, president	11/16/1926	11/30/1935	1926 to 1929
Trade Dollar Leasing Company	M.M. Hanson, president	9/11/1928	11/30/1931	1928 to 1929
Jim Daly	--	--	--	1929 to ?
Western Mines, Ltd. (Goldsil Mines, Inc.)	Samuel E Chaney, president	12/8/1934	11/30/1936	1935 to 1936
unknown operators	--	--	--	1938, 1941
Brunzell and Williams	--	--	--	1954

Source: Mitchell 2010.

Key.

-- = No data available

? = No data found on precise date

Table 7-2 Trade Dollar Mine Tailings/Waste Rock Samples Analytical Results Summary

EPA Sample ID	11384326	11384325	11384327	11384328
CLP Sample ID	MJE9C0	MJE9B9	MJE9C1	MJE9C2
Station Location ID	BK04SS	TD01SS	TD02SS	TD03SS
Description	Background	Trade Dollar Mine Tailings/Waste Rock		
TAL Metals (mg/kg)				
Aluminum	**31600**	**23400**	**11700**	**10300**
Arsenic	**13.3**	**29 JH**	**13.5 JH**	**16.9 JH**
Barium	**224**	18.3 UJK	**17.5 JK**	**23.1 JK**
Beryllium	**1.4**	**2.6**	**1.5**	**0.96**
Cadmium	**1**	**0.98**	0.41 JQ	0.42 JQ
Calcium	**6090**	**11100 JK**	**6230 JK**	**2960 JK**
Chromium	**21.3**	**23.4 JK**	**14.7 JK**	**12.6 JK**
Cobalt	**22.9**	**30.3**	**12.4**	**11.4**
Copper	**41.1**	**73.6**	**59.5**	**62**
Iron	**51000**	**51700**	**26100**	**26500**
Lead	**16.9**	**10.6 JH**	**14.8 JH**	**18.1 JH**
Magnesium	**6290**	**14000 JK**	**6410 JK**	**4360 JK**
Manganese	**1130**	**623**	**371**	**316**
Mercury	0.11 U	**0.33 JL**	**0.36 JL**	**0.5 JL**
Nickel	**26.5**	**59.2 JK**	**23.4 JK**	**19 JK**
Potassium	**3250**	**850**	**722**	**1210**
Selenium	3.5 U	3.2 U	3 U	**6.9**
Silver	1 U	**8.3**	**23**	**72.7**
Vanadium	**79.9**	**96.3 JK**	**43.2 JK**	**38.3 JK**
Zinc	**143**	**151**	**86.4**	**71.5**

Note: Bold type indicates the sample result is above the contract required quantitation limit.
Underline type indicates the sample result is significant as defined in Section 5.

Key:

CLP = Contract Laboratory Program.
CRQL = Contract Required Quantitiation Limit.
EPA = United States Environmental Protection Agency.
H = High bias.
ID = Identification.
J = The analyte was positively identified. The associated numerical value is an estimate.
K = Unknown bias.
L = Low bias.
mg/kg = milligrams per kilogram.
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL.
TAL = Target analyte list.
U = The analyte was not detected at or above the associated value.

Table 7-3 Trade Dollar Mine Sediment Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Location ID	11384323 MJE9B7 TD01SD	11384324 MJE9B8 TD02SD	11384329 MJE9C3 TD03SD
Description	**Background**	**Long Gulch**	
TAL Metals (mg/kg)			
Aluminum	3740	13400	10200
Arsenic	10.5 JH	19.3 JH	30.9 JH
Barium	75.6 JK	231 JK	112 JK
Beryllium	0.58 U	1.4	1.1
Cadmium	0.15 JQ (0.58 SQL)	1	0.89
Calcium	668 JK	1370 JK	1710 JK
Chromium	1.2 UJK	4.5 JK	5.8 JK
Cobalt	1.6 JQ (5.8 SQL)	16.5	11.6
Copper	3.7	16.6	28.5
Iron	5820	37200	34200
Lead	8.9 JH	13.4 JH	13.4 JH
Magnesium	152 JQ	1870 JK	2440 JK
Manganese	138	639	667
Mercury	0.079 JQ (0.12 SQL)	0.16 JL	1.5 JL
Nickel	4.7 UJK	12.3 JK	15.6 JK
Potassium	1160	1870	1120
Silver	0.11 JQ (1.17 SQL)	1.2 U	1.5
Vanadium	5.8 UJK	28.6 JK	30.2 JK
Zinc	43.9	181	149
Grain Size (Percent Retained)			
Percent passing < 3.2 micron sieve	0.3	0.7	0.3
3.2 micron sieve	0.3	0.3	0.3
7 micron sieve	0.2	0.2	0.2
9 micron sieve	0.1	0.2	0.2
13 micron sieve	0.5	0.7	0.1
22 micron sieve	0.3	0.3	0.3
32 micron sieve	0.2	0.2	0.1
75 micron sieve	0.4	1.1	0.4
150 micron sieve	0.9	2.1	1
250 micron sieve	2.7	5	3.2
425 micron sieve	8.1	12	11.2
850 micron sieve	21.4	21.7	27.6
2000 micron sieve	34.3	30.9	29.8
4750 micron sieve	25.1	20.5	19
9500 micron sieve	4.6	2.4	5.2
12500 micron sieve	0.7	1.8	1.3
19000 micron sieve	0.1	0.1	0.1
25000 micron sieve	0.1	0.1	0.1
37500 micron sieve	0.1	0.1	0.1
50000 micron sieve	0.1	0.1	0.1
75000 micron sieve	0.1	0.1	0.1

Note: Bold type indicates the sample result is above the contract required quantitation limit.
Underline type indicates the sample result is elevated as defined in Section 5.

Key:

CLP = Contract Laboratory Program
CRQL = Contract Required Quantitation Limit
EPA = United States Environmental Protection Agency
H = High bias
ID = Identification
J = The analyte was positively identified. The associated numerical value is an estimate.
K = Unknown bias.
L = Low bias.
mg/kg = milligrams per kilogram
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL.
SQL = Sample Quantitation Limit
TAL = Target analyte list
U = The analyte was not detected at or above the associated value

This page intentionally left blank.

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 1 Blaine tunnel. Dry.

Direction: North	Date: 9/20/11	Time: 17:28



Photo 2 Collapsed building and structure at Blaine tunnel.

Direction: South	Date: 9/20/11	Time: 17:30



Photo 3 Sample TD01SD from upstream location on Long Gulch.

Direction: Down	Date: 9/20/11	Time: 17:48



Photo 4 View of Trade Dollar Mine waste rock toeing into Long Gulch.

Direction: East	Date: 9/20/11	Time: 18:07

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 5 Sample TD02SD from downstream area of tailings/waste rock pile.

Direction: Down *Date: 9/20/11* *Time: 18:12*



Photo 6 Sample TD01SS from tailings/waste rock pile.

Direction: Down *Date: 9/20/11* *Time: 18:22*



Photo 7 Sample BK04SS from background location near Trade Dollar Mine on Long Gulch.

Direction: Down *Date: 9/20/11* *Time: 18:30*



Photo 8 Sample TD02SS from tailings/waste rock pile.

Direction: Down *Date: 9/20/11* *Time: 18:41*

TDD Number: 10-01-0006
Photographed by: Linda Costello

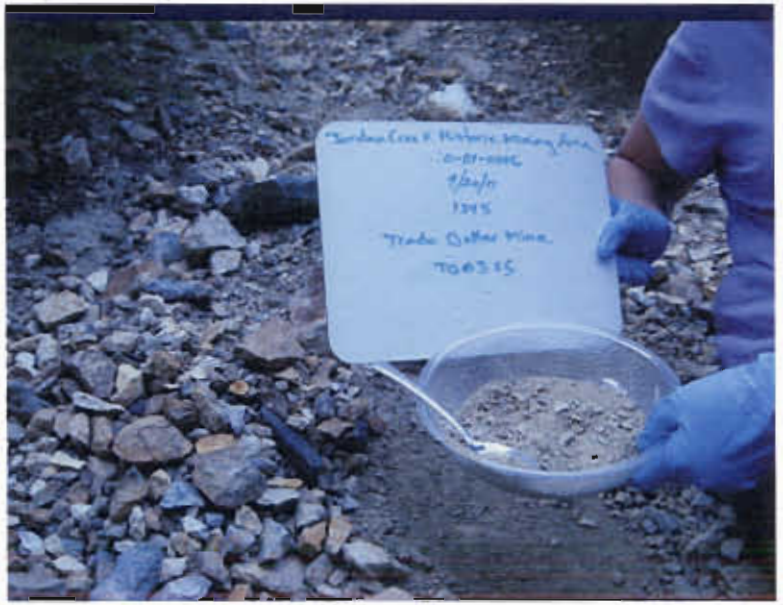


Photo 9 Sample TD03SS from tailings/waste rock pile.

Direction: Down	Date: 9/20/11	Time: 18:48



Photo 10 Collapsed mill at Trade Dollar Mine.

Direction: East	Date: 9/20/11	Time: 18:58



Photo 11 Sample TD03SD from downstream location of Long Gulch.

Direction: Down	Date: 9/20/11	Time: 19:09



Photo 12 Mercury flask in Long Gulch just downstream of TD03SD.

Direction: North	Date: 9/20/11	Time: 19:16

This page intentionally left blank.

8 Dewey Mine

Dewey Mine is a former silver and gold mine, which has been inactive since 1920. The Dewey Mine is located approximately 2 miles northwest of Silver City. The property encompasses approximately 60 acres of land located at the foot of Florida Mountain. Jordan Creek flows through the property. The Dewey Mine property contains a large collapsed mill building (called the Dewey Mill), a former powerhouse foundation, and a second smaller foundation on the south side of Jordan Creek (Figure 8-1) (E & E 2000; E & E 2011b)

A large pile of waste rock, possibly containing mill tailings, is located east of the Dewey Mill. This pile has previously been estimated to have a volume of 12,410 cubic yards (E & E 2000). A conical pile of fine material is present on top of the waste rock pile at the pile's western end near the former mill. The waste rock pile is in contact with Jordan Creek (Photograph1), which is estimated to have a flow rate of 40 cfs at this location. Two seeps, located approximately 10 feet apart, emerge from the base of the pile and discharge directly into the creek (Photographs 1, 17, and 19). These seeps have previously been described as one spring, called the Dewey Spring (see Section 8.4 below), which was observed at the site as early as 1999. During the ESI sampling event, the western seep was estimated to have a flow rate 2 cfs, while the eastern seep was estimated at 1 cfs. Dense green algae growth was observed in Jordan Creek where the seeps enter the creek (Photograph 4). Approximately 300 feet downstream of this location, cream-colored foam was observed on the surface of Jordan Creek (Photographs 2 and 5). In 1999, the bed of the seeps was described as being covered with whitish deposits (E & E 2000). There are no open mine adits at the site; however, a tunnel (known as the Dewey Tunnel) once connected this mine to other tunnels in Florida Mountain (E & E 2000). A suspected tailings pile is located to the northwest of the Dewey Mill. This pile was previously estimated to have a volume of 3,436 cubic yards (E & E 2000).

The Dewey Mill is present near the western end of the site. The mill was constructed over sloped land. The land had been terraced using stone retaining walls to create level areas within the mill. Presently, the stone terrace walls are still visible, though the mill building is no longer present, with the exception of some collapsed portions on its upper end (Photographs 7 and 11). In 2001, the upper portion of the mill was described as containing a "grizzly" made of cut rail (Limno-Tech, Inc. 2001). A grizzly is a grate constructed of parallel bars over a sluice box that is designed to separate large rock from finer material (Turrill 1876). The grizzly dumped waste rock out of the middle of the mill's north wall

via a chute. Also in 2001, a second mill was described as being present at the east end of the Dewey Mine waste rock pile. This mill was identified as the Palm Beach Inn Mill, also known as the Mystery Mill. Little is known about this mill, though it reportedly was built after 1929. It is also reported that the mill may have been associated with an operation conducted by Morrison-Knudsen in 1939. This mill is on a patented claim separate from the Dewey Mine site (Limno-Tech Inc., 2001). Vestiges of this mill were observed during the ESI field event.

Also during the ESI field event, some Silver City residents were interviewed to obtain local knowledge of mercury sources. During these conversations, two residents reported that every few years a man comes to the Silver City area to scavenge for valuables. This man reportedly has on several occasions recovered elemental mercury from the Jordan Creek streambed adjacent to the Dewey Mine. He reportedly uses a vacuum system to siphon mercury resting on bedrock in the stream combined with a separator to isolate the mercury from sediment and stream water. One resident reported that in 2009, this man had recovered 13 ounces of mercury from the streambed at the Dewey Mine, which he later sold (E & E 2011b).

As per the SQAP, the Dewey Mine site was not intended to be sampled as a part of this ESI since this site has been the subject of more than one stand-alone investigation. However, due to the receipt of this new information regarding the possibility that elemental mercury was present in Jordan Creek at the Dewey Mine, a decision was made, in consultation with the TM, to sample the seeps and the streambed in this area (see SPAFs in Appendix A).

PPEs at the site include locations where waste rock is in contact with Jordan Creek and the seeps. The surface water migration pathway 15-mile TDL is entirely contained in Jordan Creek (Figure 8-2). Jordan Creek has an estimated flow rate of 15 cfs at the Dewey Mine. Fishing is known to occur on Jordan Creek within the 15-mile TDL wherever deep pools of water occur (Nelson 2011a). During the ESI field event, such a pool was observed immediately upstream of the site where a bridge crosses Jordan Creek. A travel trailer was observed at this location, though no one was observed to be fishing. In 1994, a location 1 mile downstream of the site was described as being "very suitable for fishing" (E & E 2000). The nearest wetland to the site is a PSSC wetland located approximately 2 miles downstream of the PPEs. Approximately 3 miles of wetland frontage is present on Jordan Creek within the 15-mile TDL. Although livestock grazing from Jordan Creek at Dewey Mine was not observed at the time of the ESI field event, it was observed in 2001 (Limno-Tech, Inc. 2001).

8.1 Geologic Features

The ore minerals from Florida Mountain that the Dewey Mine accessed contained finely disseminated gold-and-silver-bearing chalcopyrite and argentite in quartz gangue, with gold contained chiefly in chalcopyrite and silver in the argentite. The gangue consists of quartz and valencianite (E & E 2000).

8.2 Ownership/Operator History

The mineral vein at the Dewey Mine was first discovered in 1865. It was worked by a number of small enterprises from 1865 to 1889. In 1881, E. W. Dewey found silver ore on the north slope of Florida Mountain. He promoted and developed several mines on Florida Mountain, built the Dewey Mill at Dewey Mine, and established a new town called Dewey, where the Dewey Mill and a three-story hotel were built. He then sold his claims to bigger enterprises (the date of this sale is unknown). Between 1895 and 1897, the Dewey Mill was owned by the Florida Mountain Mining and Milling Company, which also operated the nearby Booneville Mine at this time. Ore was mined from the Booneville Mine and shipped to the Dewey Mill for processing. The Booneville Mine included several mineral claims located on the north slope of Florida Mountain, on the south side of Jordan Creek, and later became a part of the Dewey Mine. (E & E 2000)

In 1899, the Florida Mountain Mining and Milling Company consolidated with the Trade Dollar Mining and Milling Company to form the Trade Dollar Consolidated Mining Company. The Trade Dollar Consolidated Mining Company operated at the Dewey Mine for the next 10 years. In 1910, the Trade Dollar Consolidated Mining Company ceased operations at Dewey Mine due to declining ore reserves. The Dewey Mine was subsequently idle for nearly a decade. In 1917, the Dewey Mine was reopened by a new company, Florida Mountain Mines Company. However, activity was limited to extracting and milling the low-grade workings, and the enterprise failed in 1920. No mining activity is known to have occurred since that time.

In 1929, the Dewey Mill was sold to Mr. Jim Daly. In 2000, the property was owned by Chipmunk Grazing Association, which bought the property from the Sheep Company in 1967 for livestock grazing. The history of the property transaction(s) between the ownerships of Mr. Jim Daly and the Sheep Company is not known (E & E 2000).

The configuration of property ownership as of 2001 is depicted in Figure 8-3.

8.3 Site History

Major operations at the Dewey Mine included mining the silver and gold mineral veins in Florida Mountain via tunnels excavated in the mountain. At the Dewey Mine, ore was accessed through the Dewey Tunnel, a single tunnel opening that connected to a series of tunnel within Florida Mountain. Ore was transported to the Dewey Mill. By 1900, the Trade Dollar Consolidated Mining Company had combined operations at the Dewey Mine with those of the Trade Dollar, Black Jack, and Booneville mines on Florida Mountain, which it also owned. The mines were worked entirely through tunnels, all of which were connected underground and were on the same vein system. By 1903, all of the ore from these mines was brought out of the Dewey Tunnel for processing in the 20-stamp

Dewey Mill (E & E 2000; Mitchell 2010). The Dewey Adit (Dewey Tunnel) was equipped with 40-pound rails and an electric trolley for hauling ore to the mill (IBM&G 1926).

This mill had a daily capacity of 47 dry tons. In addition to the stamps, mill equipment consisted of 12 Frue vanners, 10 amalgamating pans, and five settlers (Mitchell 2010). The stamps were used to crush ore through a 30-mesh screen. Crushed ore, classified by a hydraulic separator, was loaded onto the Frue vanners (a type of ore classifier), on which as much as possible of the gold- and silver-bearing minerals were collected (E & E 2000). The tailings from the vanners then passed to thickening cones, then to the amalgamating pans, in which they were reground with mercury in the presence of copper sulphate, salt, and a small amount of lye (IBM&G 2010). Typically, silver and gold were recovered by subjecting the amalgam to heat and evaporating the mercury (E & E 2000). The total recovery from this ore was 91.5 percent of the silver and 94.5 percent of the gold (IBM&G 2010). Re-condensed mercury was collected and reused; however, it is not clear how this process was applied at the Dewey Mill (E & E 2000). The Dewey Mill used up to 20 flasks of mercury per month. Approximately one-third of the mill concentrates were recovered as bullion, while the remaining mill concentrates were shipped to smelters for further processing. By 1909, this mining group had grossed approximately $20,000,000 (Mitchell 2010).

Power at the Dewey Mine was supplied from the Swan Dam Power Plant, located on the Snake River, which was owned and operated by the mine owners (IBM&G 1926; Mitchell 2010).

8.4 Previous Mine Sampling

8.4.1 Mercury Contamination Study

In 1973, the Dewey Mill was sampled as a part of the study of mercury contamination in the Jordan Creek Drainage conducted by a geology student at the University of Idaho. Four soil samples were found to contained mercury above the detection limit of 0.1 ppm. Mercury concentrations in these samples ranged from 0.56 to 47.1 ppm (i.e., mg/kg) (Hill 1973).

8.4.2 Environmental Baseline Study

In 1988, an Environmental Baseline Study, covering an area of approximately 6,400 acres, was conducted by CH2M Hill for the BLM at Florida Mountain. This study was conducted in support of possible development of a gold mine in the area. As part of the study, surface water quality in Jordan Creek and its tributaries near the site was characterized, and fish tissue samples were collected. The study indicated that the water quality of the Dewey Spring was impacted by historic mining activities. Results indicated high concentrations of iron, manganese, zinc, aluminum, and sulfate, as well as a pH between 5.0 and 6.5, a result of oxidation of pyrite in exposed rocks. Trace metal analysis of surface water in Jordan Creek near the site indicated that the concentrations of copper and

zinc exceeded the EPA's Ambient Water Quality Criteria at that time for the protection of fresh water aquatic life of 0.012 mg/L for copper and 0.011 mg/L for zinc. Fish muscle tissue analysis indicated that cadmium (0.11 mg/kg), copper (1.22 mg/kg), mercury (0.66 mg/kg), selenium (0.8 mg/kg), and zinc (16.6 mg/kg) were present in redband trout collected from Jordan Creek near the Dewey Mine site (E & E 2000).

8.4.3 Jordan Creek Watershed Site Inspection

Between 1998 and 1999, E & E conducted an SI for the Jordan Creek Watershed on behalf of the EPA. Sediment samples were collected in Jordan Creek and its tributaries near the Dewey Mine site, as well as upstream and downstream from the mine. The sediment sample collected in Jordan Creek just below the waste rock pile contained elevated concentrations of copper (126 mg/kg) and zinc (510 mg/kg) with respect to background concentrations. Mercury was not detected at this location. The sediment sample collected in Jordan Creek, approximately 0.5 miles downstream from the site, indicated elevated concentrations of mercury (3.7 mg/kg) (E & E 1999).

8.4.4 Dewey Mine Site Inspection

In 2000, this mine was the subject of a stand-alone SI, also conducted by E & E for the EPA (E & E 2000). During the SI site visit, waste rock was observed throughout the site, especially along the bank of Jordan Creek. The Dewey Spring had a pH of 3.59. The roof of the mill had collapsed, and the building appeared to be unstable. A suspected tailings pile was located to the northwest of the Dewey Mill. Samples were collected of tailings, waste rock, the mill foundation area, and the powerhouse area, as well as the sediments of Jordan Creek. Samples were only analyzed for mercury. Sample locations with corresponding mercury results are shown in Figures 8-4 and 8-5.

Tailings, waste rock, and soil samples contained significant concentrations of mercury with respect to background concentrations. By far the highest concentrations of mercury were observed at the mill foundation area, with concentrations increasing as sample locations moved downslope. The highest concentration of mercury detected in this area was 247 mg/kg. Sediment samples did not likewise demonstrate elevated mercury concentrations with respect to background concentrations; however, the background location may not have been sufficiently upstream to be outside of the mine's influence, or it may have been under the influence of the Mystery Mill.

One of the two background sediment samples collected from the background location had a mercury concentration of 4.44 mg/kg. The location of this sample on the SI sample location map was estimated during the ESI field event and appeared to possibly be near the eastern end of the waste rock pile, and possibly near the Mystery Mill. This sample's actual location could not be definitively determined since the SI map is a sketch and as such is not drawn to scale. Given the mercury concentration observed and the sample's potential proximity to the

eastern end of the waste rock pile and the Mystery Mill, it is suspected that this location was under the influence of one or both of these features.

8.4.5 Phase 1a Site Characterization and Screening Risk Analysis

In November 2001, Limno-Tech, Inc., completed a Phase 1a Site Characterization and Screening Risk Analysis for the Dewey Mine site in an effort to determine the site's relative risk to human health and the environment (Limno-Tech, Inc. 2001). Field sampling was conducted in August 2001 during low flow conditions. The Phase 1a study included collecting samples of waste rock, mine tailings, soil at the lower end of the Dewey Mill foundation, seeps, and surface water and sediment from Jordan Creek. In addition, samples of soil and waste rock at the Mystery Mill were collected, as was water from a seep entering Jordan Creek near this mill. Sample locations are presented on Figure 8-6.

All samples were analyzed for total metals, arsenic, cyanide, and mercury, while water samples also were analyzed for dissolved metals. Sample results were compared to applicable human health and ecological risk-based screening criteria. The Phase 1a study concluded the following:

- The Dewey Mine may pose a public health hazard for persons such as hikers, campers, or site trespassers who drink or come in contact with water from Jordan Creek;
- Heavy metals, particularly arsenic and mercury, in Jordan Creek may pose a public health hazard for persons who consume fish from the creek;
- Heavy metals, including aluminum, cadmium, copper, manganese, and zinc in Jordan Creek water could have significant impacts on aquatic biota in these creeks;
- Heavy metals in soil and sediment at the Dewey Mine are not likely to pose a public health hazard to persons who infrequently come in contact with these materials; and
- Heavy metals in soil or sediment at the Dewey Mine, including aluminum, arsenic, cadmium, copper, iron, lead, manganese, mercury, silver, and zinc, could significantly impact biota that live at or frequent the site (Limno-Tech, Inc. 2001).

The Phase 1a study included recommendations for high flow sampling of site features to account for potentially significant differences in site dynamics between low flow and high flow seasons; a suggestion that a more focused literature search be conducted to further reveal the nature of the operations at the Dewy Mine; that methods be employed to reduce metals loading to Jordan Creek; and that certain biological studies be conducted (Limno-Tech, Inc. 2001).

For the purposes of this ESI, sample results for total mercury at all Phase 1a sample locations are presented on Figure 8-6. Mercury concentrations in waste rock, tailings, and soil samples collected from potential sources at the Dewey

Mine ranged from 0.25 to 8.19 mg/kg. The highest mercury concentration detected was in the sample collected at the downslope end of the former mill building, near the SI sample that had a concentration of 247 mg/kg. The discrepancy between sample results from the Phase 1a study and the SI could be accounted for by the sampling techniques used. Samples for the Phase 1a study were collected from near surface locations at approximately 5 to 10 centimeters bgs (i.e., 2 to 4 inches), while samples collected for the SI were collected from 12 to 18 inches bgs. Due to the volatile nature of mercury, depths nearer to the surface can be expected to have undergone greater mercury dissipation than deeper locations. There also was a difference in the analytical methods applied. The Phase 1a study employed EPA Method 7471A for total mercury analyses, while the SI employed EPA Method 245.5; however, both methods make use of cold-vapor atomic absorption spectrometry and, for this reason, can be expected to generate similar results.

The Dewey Spring sample (DTSEEP1&2 Comp) contained mercury at a concentration of 0.0052 µg/L, which was lower than the concentrations detected in two downstream water samples collected from Jordan Creek. Specifically, the sample collected 100 feet downstream of the Dewey Spring (JCSEEP2+100) contained mercury at 0.193 µg/L, while a second sample (DTJCDS) collected further downstream and downstream of all site features contained mercury at 0.0914 µg/L.

An increase in mercury concentrations in Jordan Creek water was observed between the sample collected upstream of both Dewey Mine and Mystery Mill, and the sample collected 100 feet downstream of the Dewey Spring. Since no samples were collected between these two locations, it is not possible to determine with certainty whether the source of contamination is from the large waste rock pile at Dewey Mine, or from features at the Mystery Mill. However, there are two indications that the Mystery Mill is more likely to be responsible for this increase:

1. A seep that was sampled at the Mystery Mill had the highest total mercury concentration of all water samples collected during the Phase 1a at 3.92 µg/L; and
2. Soil at the former mill had higher mercury concentrations than those in the Dewey Mine waste rock pile. Mercury concentrations in soil samples collected from the former mill ranged from 1.5 to 91.8 mg/kg (three samples), while those from the Dewey Mine waste rock pile ranged from 0.25 to 1.28 mg/kg (six samples).

8.5 ESI Sampling

The seeps were sampled during the ESI field event, as were Jordan Creek stream sediments. Figure 8-7 illustrates these sample locations, along with corresponding mercury concentrations.

8.5.1 Seep Samples

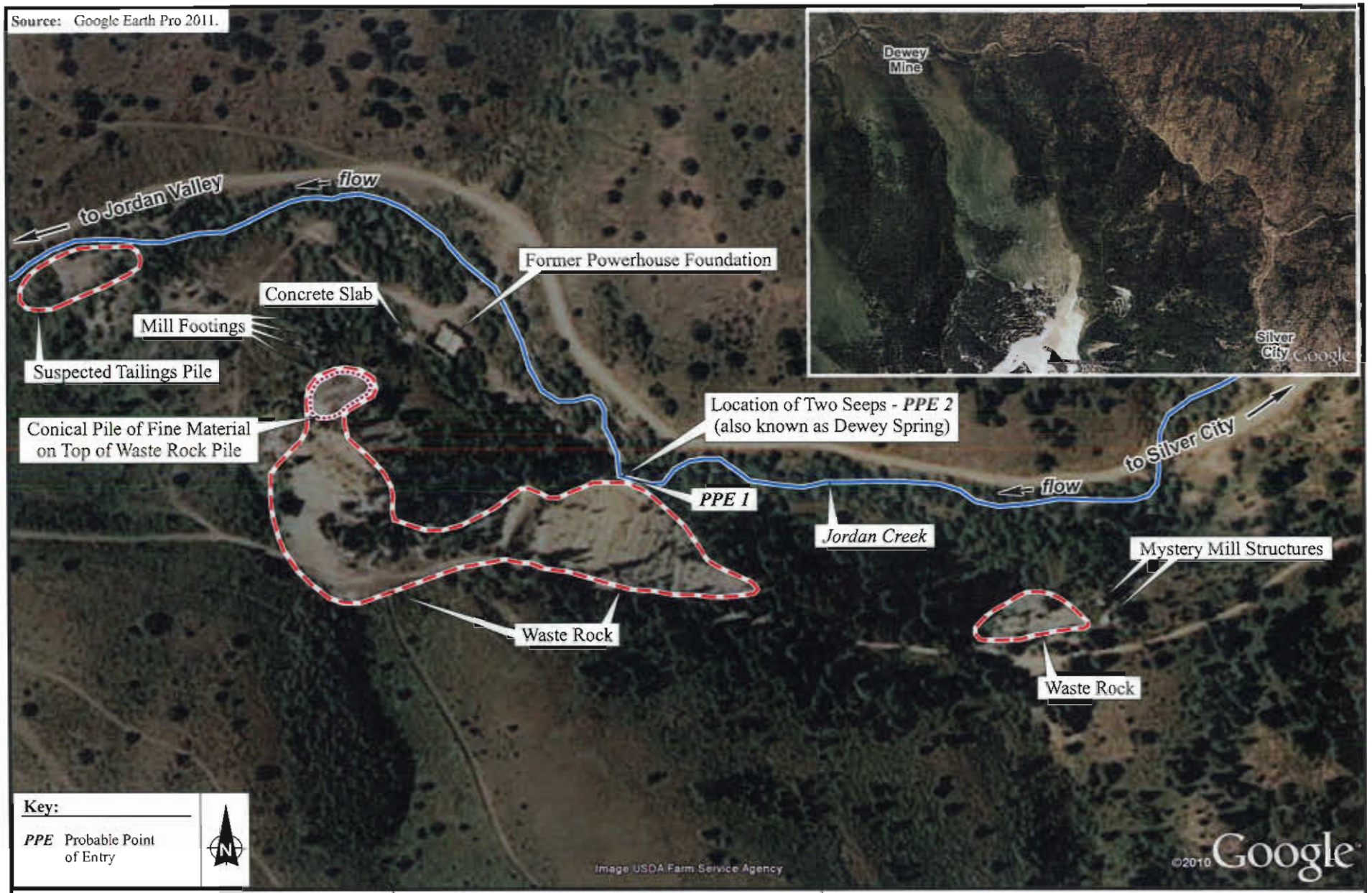
Two samples (DM01SP and DM02SP) were collected from seeps emerging from the base of the Dewey Mine waste rock pile. A background sample (BK01SR) was collected from a spring in Silver City.

Sample results are presented in Table 8-1 and indicate the presence of seven metals (beryllium, cadmium, cobalt, copper, manganese, nickel, and zinc) at significant concentrations with respect to background concentrations. Each analyte was detected at significant concentrations in both seep samples. Mercury was not detected in either sample.

8.5.2 Sediment Samples

Four sediment samples (DM01SD through DM04SD) were collected from Jordan Creek. DM01SD was the most downstream sediment sample collected and was nearest to the mill footings. Sample DM02SD was collected approximately 150 feet further upstream, and sample DM03SD was collected even further upstream and within 90 feet of the seeps and a location where waste rock is intruding into the creek. Lastly, sample DM04SD was collected upstream of all site features, including Mystery Mill features, as a background sample.

Sample results are presented in Table 8-2 and indicate the presence of vanadium and zinc at elevated concentrations in DM01SD and arsenic, beryllium, cadmium, cobalt, copper, lead, manganese, vanadium, and zinc at elevated concentrations with respect to background concentrations in DM02SD. The sample collected nearest to the seeps and intruding waste rock did not contain elevated concentrations of metals. Mercury was not detected at elevated concentrations in any of the sediment samples; however, it was present in all samples, including the background sample, at concentrations ranging from 0.43 to 1.8 mg/kg. The potential source of mercury in the background sample is not known.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

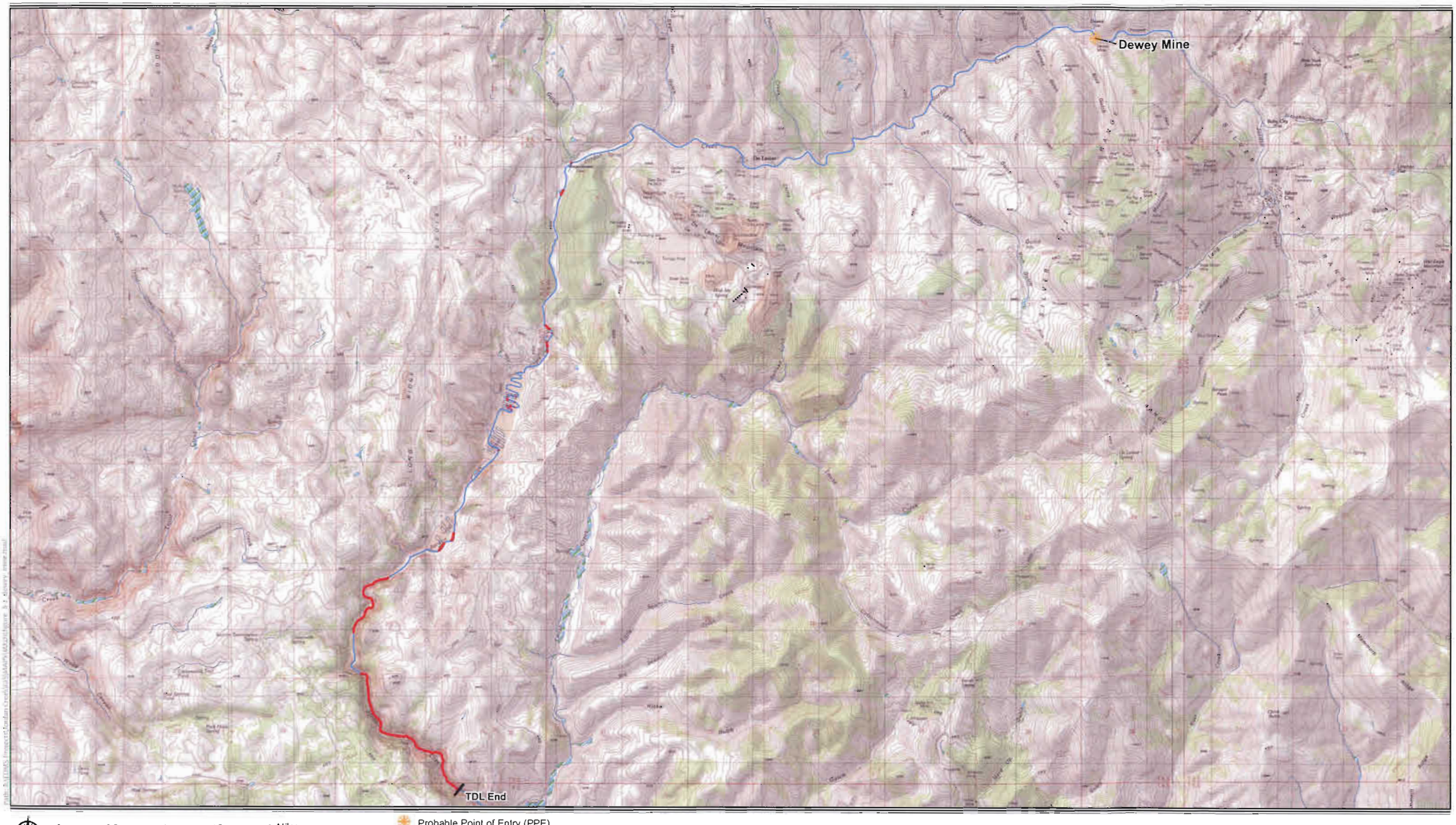
0 140 280
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 8-1
DEWEY MINE SITE MAP

Date:	Drawn by:	
12/13/11	AES	10:START-3\10010006\fig 8-1

This page intentionally left blank.



0 0.5 1 1.5 2 Miles

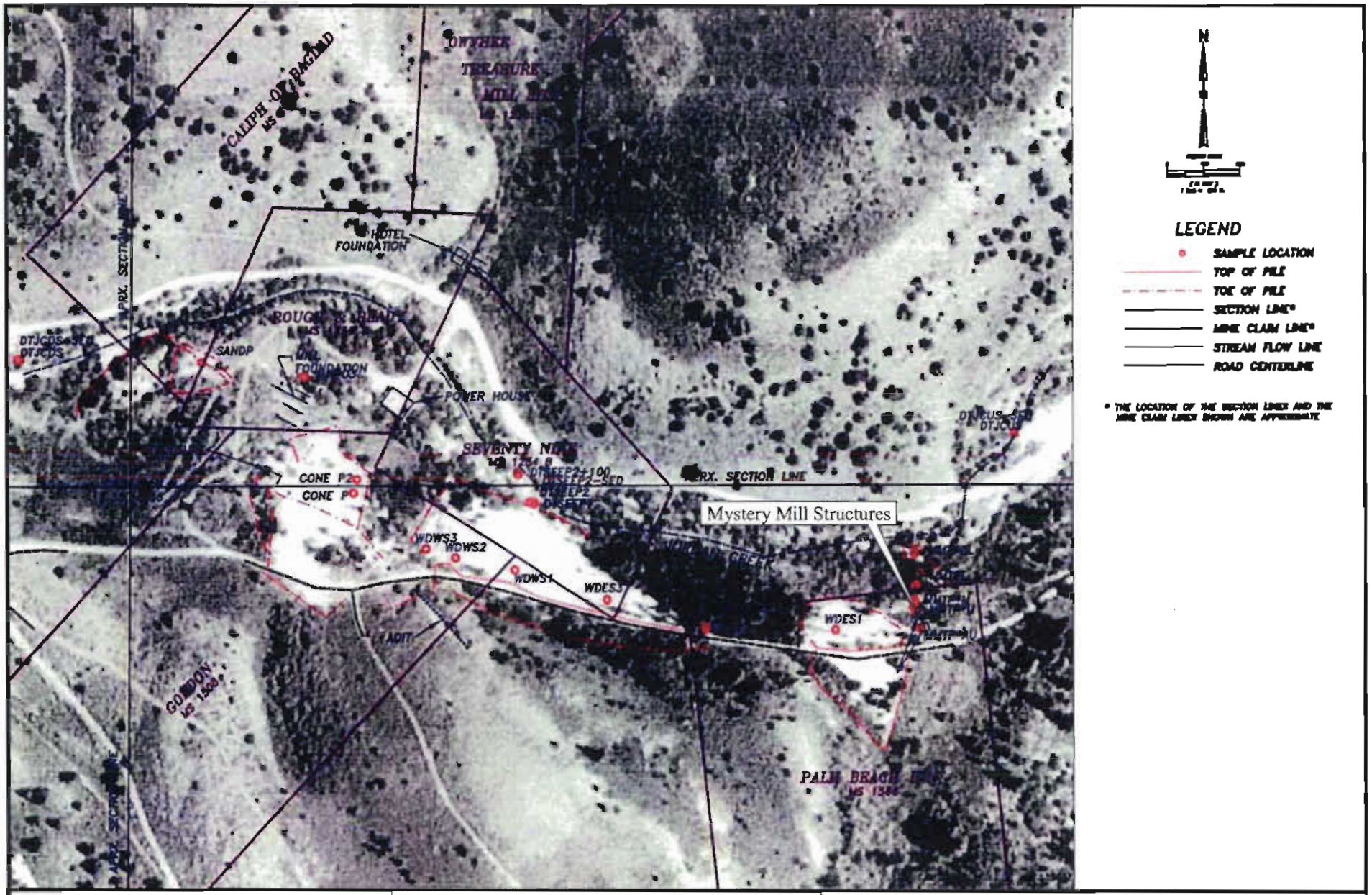
ecology and environment, inc.
Global Specialists in the Environment

Source: National Wetlands Inventory - U.S. Fish and Wildlife Service (2018), Topographic Image - ESRI (2018)

- Probable Point of Entry (PPE)
- Jordan Creek
- Wetlands Intersect with TDL
- TDL End
- Wetlands

Figure 8-2
Dewey Mine
15-Mile Target Distance Limit Map

Southwest Idaho



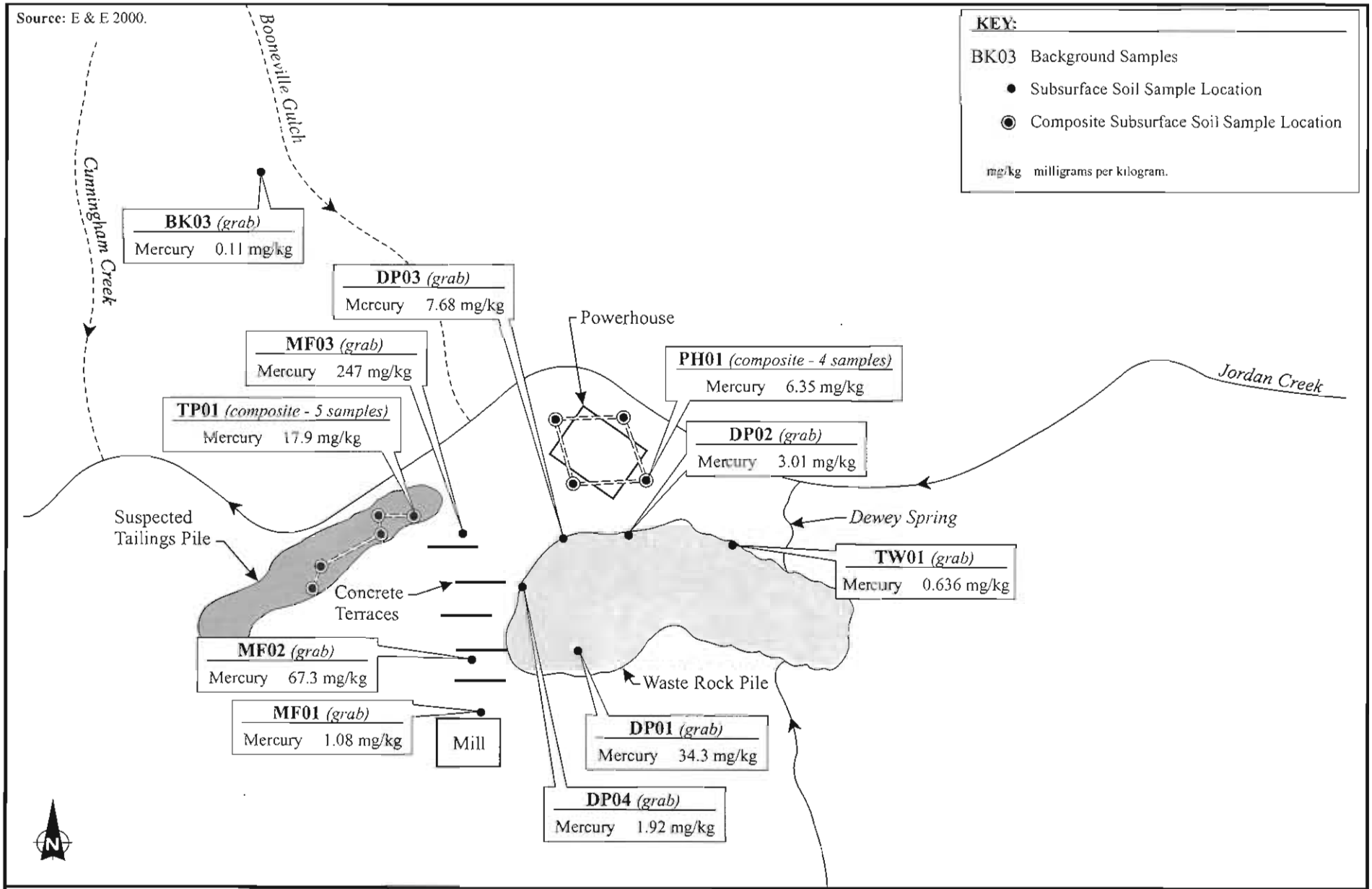
ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

Figure 8-3
DEWEY MINE OWNERSHIP MAP 2001

Source: Limno-Tech Inc., 2001; Owyhee County Assessor.

Date:	Drawn by:	
12/22/11	AES	10:START-3\10010006\fig 8-3



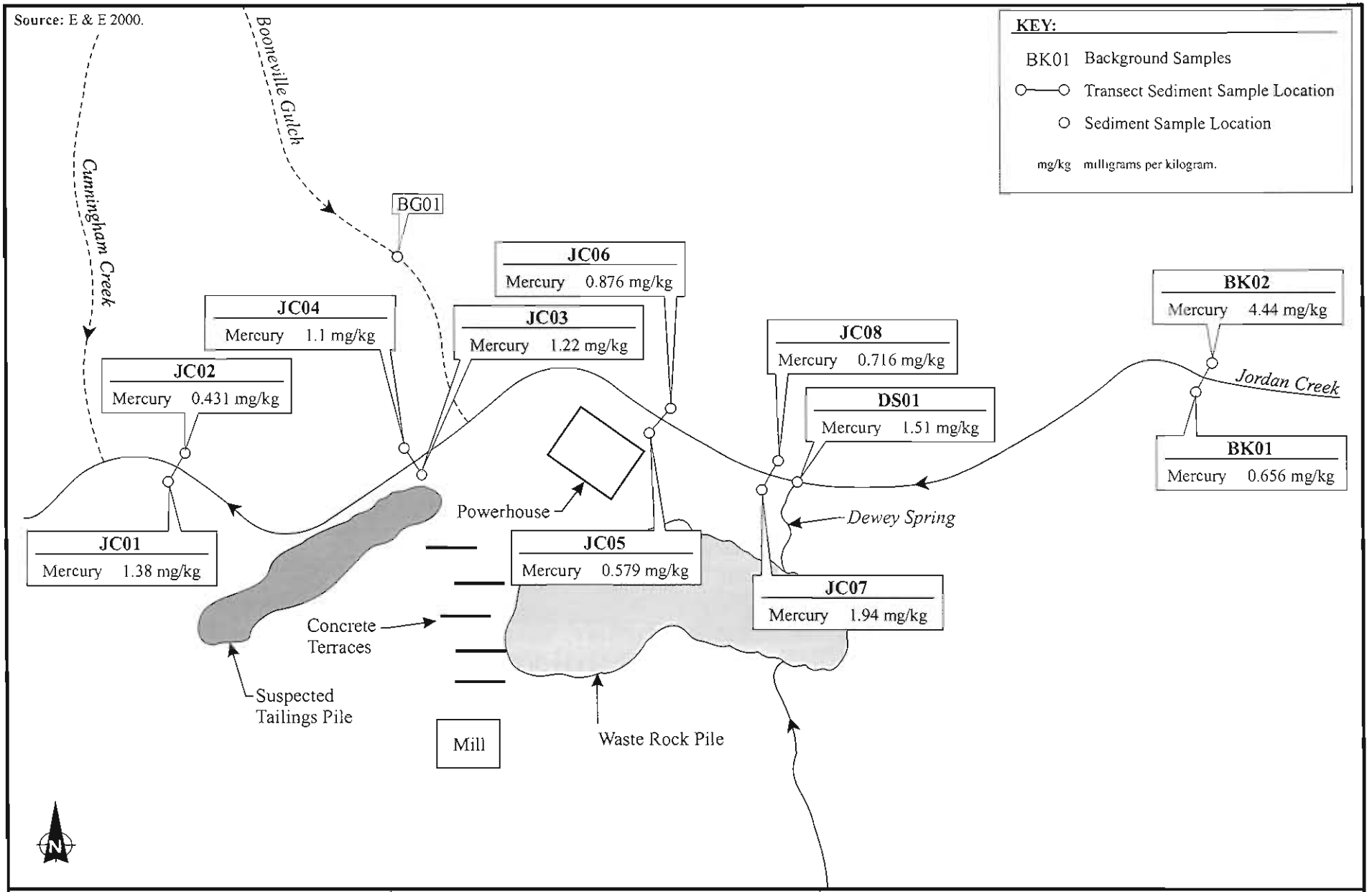
ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

Not to Scale

Figure 8-4
DEWEY MINE SITE INSPECTION SOURCE
SAMPLE LOCATION AND MERCURY RESULTS MAP

Date: 12/9/11
Drawn by: AES
10:START-3\10010006\fig 8-4



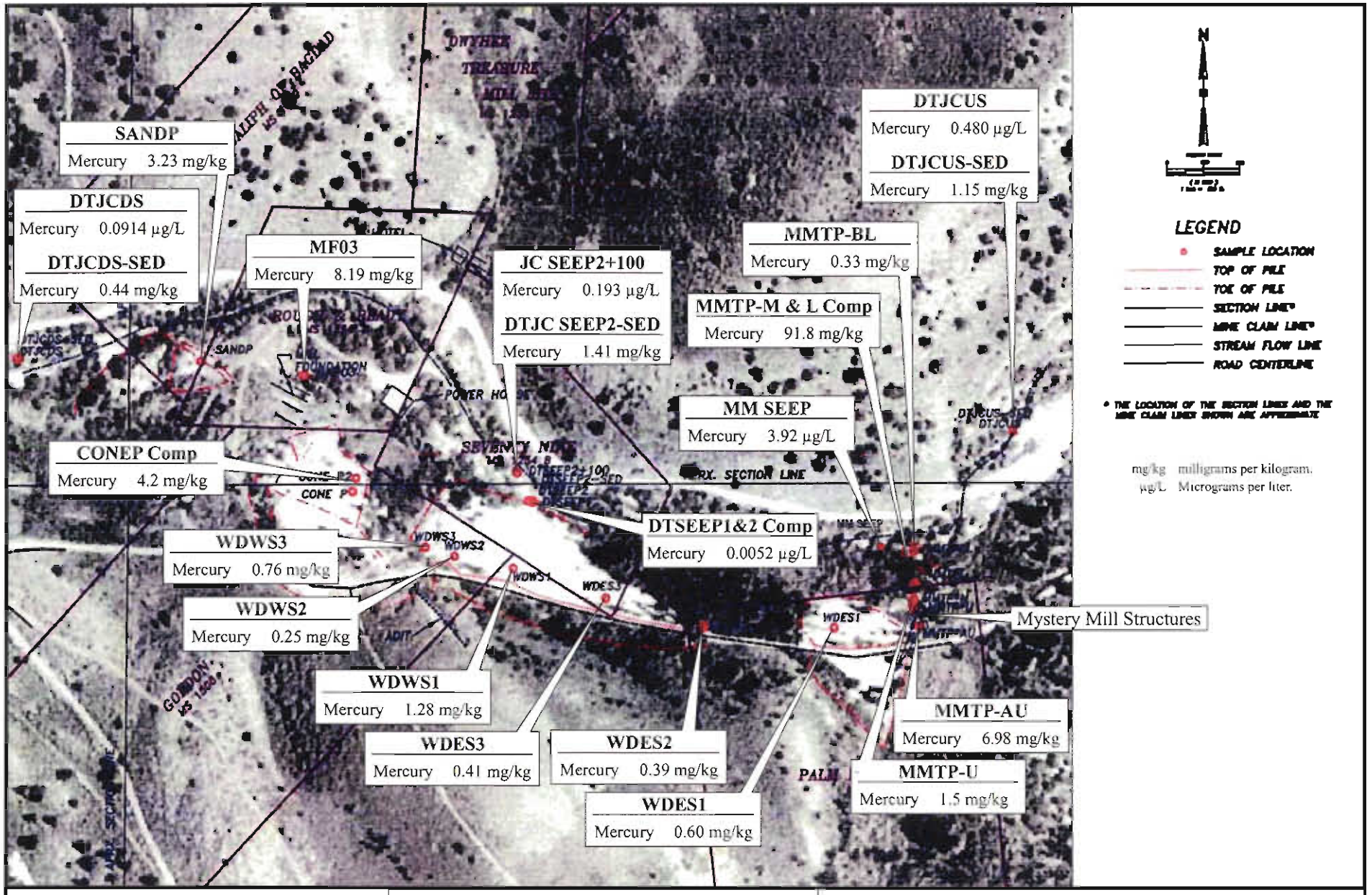
ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

Not to Scale

Figure 8-5
DEWEY MINE SITE INSPECTION SEDIMENT
SAMPLE LOCATION AND MERCURY RESULTS MAP

Date: 12/9/11 | Drawn by: AES | 10:START-3\10010006\fig 8-5



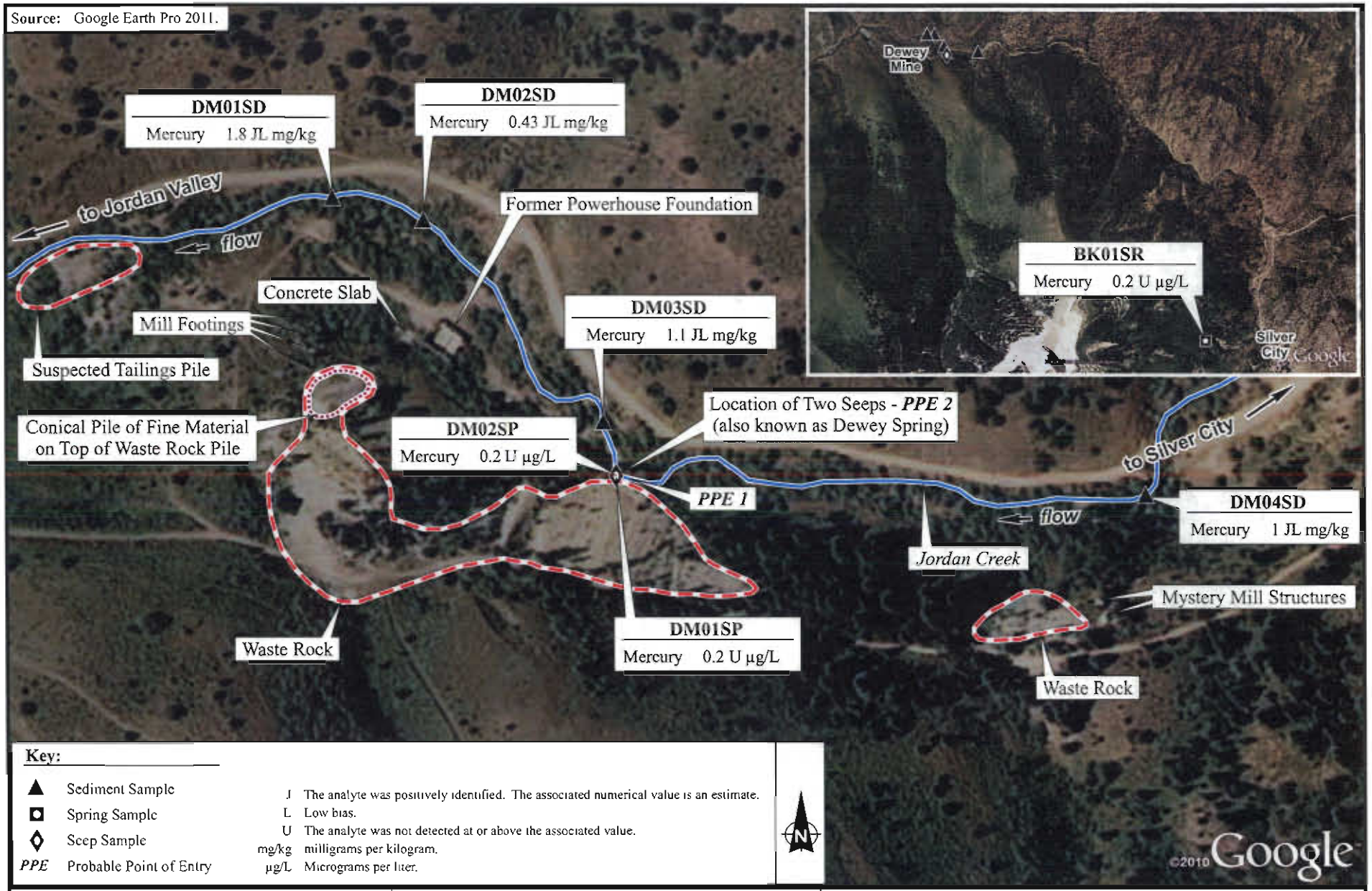
ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

Source: Linno-Tech Inc., 2001.

Figure 8-6
DEWEY MINE PHASE 1A SITE CHARACTERIZATION
AND SCREENING RISK ANALYSIS
SAMPLE LOCATIONS AND MERCURY RESULTS

Date:	Drawn by:	
4/10/12	AES	10:START-3\10010006\fig 8-6



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 140 280
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 8-7
DEWEY MINE ESI SAMPLE LOCATIONS AND MERCURY RESULTS

Date: 12/13/11
Drawn by: AES
10:START-3\10010006\fig 8-7

Table 8-1 Dewey Mine and Mill Seep Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Location ID	11384337 MJE9D1 BK01SR	11384341 MJE9D5 DM01SP	11384342 MJE9D6 DM02SP
Description	**Background**	**Dewey Mine Seep**	
TAL Metals (µg/L)			
Aluminum	**485**	**9750**	**10000**
Beryllium	5 U	**20.2**	**19.9**
Cadmium	5 U	**6.4**	**6.5**
Calcium	5000 U	**74700**	**75200**
Cobalt	50 U	**51.3**	**59**
Copper	25 UJL	**122 JL**	**126 JL**
Iron	**399**	100 U	100 U
Magnesium	360 JQ	**15600**	**15600**
Manganese	15 U	**2830**	**2940**
Mercury	0.2 U	0.2 U	0.2 U
Nickel	40 U	**49.9**	**49.7**
Potassium	570 JQ	**9170**	**9260**
Sodium	5000 U	**7940**	**7850**
Zinc	60 U	**1630**	**1650**

Note: Bold type indicates the sample result is above the contract required quantitation limit.
Underline type indicates the sample result is significant as defined in Section 5.

Key:

CLP = Contract Laboratory Program.
CRQL = Contract Required Quantitation Limit.
EPA = United States Environmental Protection Agency.
ID = Identification.
J = The analyte was positively identified. The associated numerical value is an estimate.
L = Low bias.
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL.
TAL = Target analyte list.
U = The analyte was not detected at or above the associated value.
µg/L = Micrograms per liter.

Table 8-2 Dewey Mine and Mill Sediment Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Location ID	11384343 MJE9D7 DM04SD	11384338 MJE9D2 DM01SD	11384339 MJE9D3 DM02SD	11384340 MJE9D4 DM03SD
Description	**Background**	**Jordan Creek**		
TAL Metals (mg/kg)				
Aluminum	2700	5780	3880	2640
Arsenic	2.9 JH	6.9 JH	379 JH	3.7 JH
Barium	25.2 JK	49 JK	96.1 JK	23.1 UJK
Beryllium	0.13 JQ (0.45 SQL)	0.49 JQ	1.3	0.37 JQ
Cadmium	0.049 JQ (0.45 SQL)	0.14 JQ	0.68	0.066 JQ
Calcium	668 JK	1470 JK	655 JK	578 UJK
Chromium	1.2 JK	2.7 JK	3.5 JK	1.4 JK
Cobalt	4.5 U	6 U	7.2	5.8 U
Copper	2.4	6.7	19.1	3.4
Iron	4670	9720	21400	4840
Lead	3.6 JH	13 JH	32.7 JH	3.7 JH
Magnesium	582 JK	1340 JK	527 JQ	556 JQ
Manganese	94.4	181	287	90.5
Mercury	1 JL	1.8 JL	0.43 JL	1.1 JL
Nickel	3.6 UJK	4.8 UJK	4.7 UJK	4.6 UJK
Potassium	478	978	1070	514 JQ
Silver	0.54 JQ (0.89 SQL)	3	0.97 JQ	1.1 JQ
Vanadium	4.5 UJK	8.5 JK	22.5 JK	5.8 UJK
Zinc	24.5	61.5	107	26.7
Grain Size (Percent Retained)				
Percent passing < 3.2 micron sieve	0.6	1.3	0.3	0.7
3.2 micron sieve	0.6	0.4	0.9	0.7
7 micron sieve	0.1	1.3	0.1	1.5
9 micron sieve	1.2	0.1	0.1	0.4
13 micron sieve	0.1	0.1	0.1	0.4
22 micron sieve	0.3	0.4	0.2	0.1
32 micron sieve	0.1	0.2	0.1	0.1
75 micron sieve	2.5	3.2	0.2	0.6
150 micron sieve	7.1	14.8	0.7	2.9
250 micron sieve	16.7	47.2	3	14.2
425 micron sieve	23.4	28.8	9.7	30.8
850 micron sieve	21.4	2.3	21.4	37.9
2000 micron sieve	19.5	0.1	34.8	9.7
4750 micron sieve	3.8	0.1	19.8	0.1
9500 micron sieve	2.1	0.1	6	0.1
12500 micron sieve	0.6	0.1	2.6	0.1
19000 micron sieve	0.1	0.1	0.1	0.1
25000 micron sieve	0.1	0.1	0.1	0.1
37500 micron sieve	0.1	0.1	0.1	0.1
50000 micron sieve	0.1	0.1	0.1	0.1
75000 micron sieve	0.1	0.1	0.1	0.1

Note: Bold type indicates the sample result is above the contract required quantitation limit
Underline type indicates the sample result is elevated as defined in Section 5

Key

CLP = Contract Laboratory Program.
CRQL = Contract Required Quantitation Limit
EPA = United States Environmental Protection Agency
H = High bias
ID = Identification
J = The analyte was positively identified. The associated numerical value is an estimate.
K = Unknown bias.
L = Low bias
mg/kg = milligrams per kilogram.
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL.
SQL = Sample Quantitation Limit
TAL = Target analyte list.
U = The analyte was not detected at or above the associated value

This page intentionally left blank.

TDD Number: 10-01-0006
Photographed by: Linda Costello (LC), Ada Hamilton (AH)

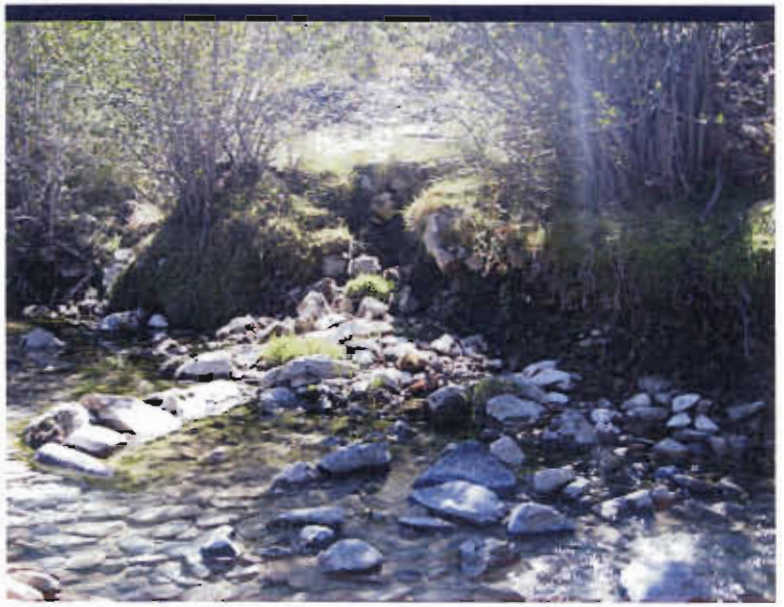


Photo 1 Waste rock toeing into Jordan Creek. Also flowing seep is in view.

Direction: South *Date: 9/21/11* *Time: 13:35* *Taken by: LC*



Photo 2 White foam in Jordan Creek just downstream of tributary draining waste rock piles.

Direction: Southeast *Date: 9/21/11* *Time: 13:37* *Taken by: LC*



Photo 3 Green algae below tributary in Jordan Creek.

Direction: East *Date: 9/21/11* *Time: 13:42* *Taken by: LC*



Photo 4 Dense green algae in Jordan Creek below waste rock seeps.

Direction: South *Date: 9/21/11* *Time: 13:43* *Taken by: LC*



Photo 5 Foam in Jordan Creek further downstream.

Direction: Southwest Date: 9/21/11 Time: 13:48 Taken by: LC



Photo 6 Dewey waste rock piles.

Direction: Southwest Date: 9/21/11 Time: 13:50 Taken by: LC



Photo 7 Dewey waste rock and rock wall mill foundation terraces.

Direction: South Date: 9/21/11 Time: 13:51 Taken by: LC



Photo 8 Olive green algae coating stream bed of Jordan Creek downstream of collapsed mill and waste rock and tailings piles.

Direction: South Date: 9/21/11 Time: 13:56 Taken by: LC



Photo 9 View of Jordan Creek upstream of sediment sample DM01SD at Dewey Mine.

Direction: East *Date: 9/22/11* *Time: 12:21* *Taken by: AH*



Photo 10 Sample DM01SD.

Direction: Down *Date: 9/22/11* *Time: 12:25* *Taken by: AH*



Photo 11 Concrete foundation terraces.

Direction: South *Date: 9/22/11* *Time: 12:33* *Taken by: AH*



Photo 12 Sample DM02SD.

Direction: West *Date: 9/22/11* *Time: 12:40* *Taken by: AH*

TDD Number: 10-01-0006
Photographed by: Linda Costello (LC), Ada Hamilton (AH)



Photo 13 Jordan Creek upstream of DM02SD.

Direction: East	Date: 9/22/11	Time: 12:49	Taken by: AH



Photo 14 Location of sample DM03SD at confluence of grayer sediment and reddish-brown sediment, 40 feet downstream of seeps.

Direction: West	Date: 9/22/11	Time: 13:02	Taken by: AH



Photo 15 Sample DM03SD.

Direction: West	Date: 9/22/11	Time: 13:09	Taken by: AH

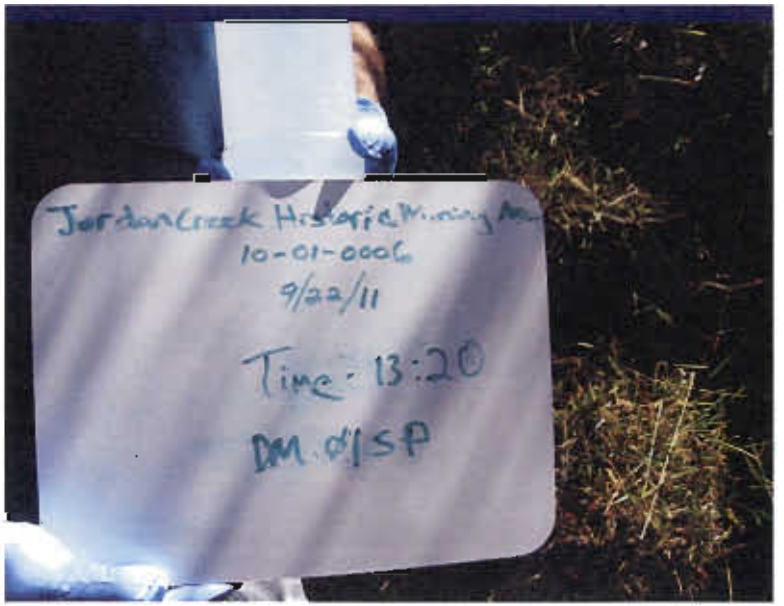


Photo 16 Sample DM01SP.

Direction: East	Date: 9/22/11	Time: 13:20	Taken by: AH



Photo 17 View of western seep.

Direction: East	Date: 9/22/11	Time: 13:22	Taken by: AH



Photo 18 Sample DM02SP.

Direction: Down	Date: 9/22/11	Time: 13:26	Taken by: AH

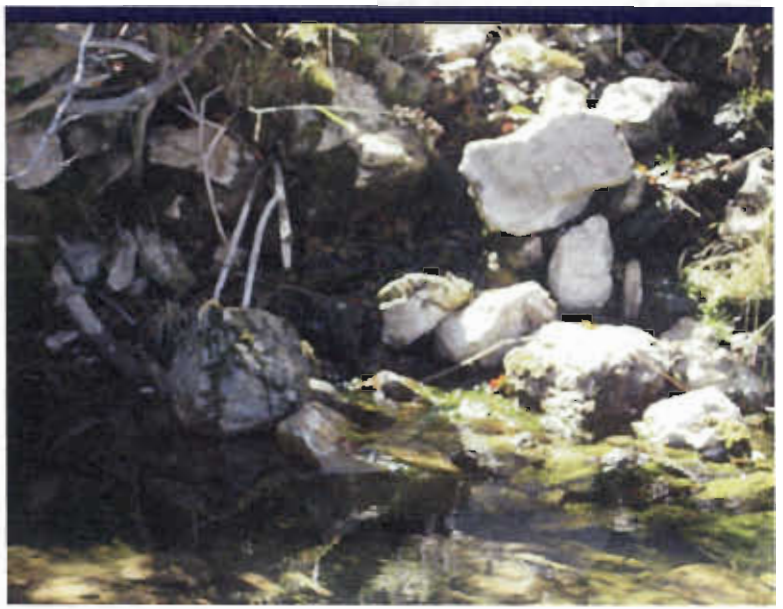


Photo 19 View of eastern seep.

Direction: South	Date: 9/22/11	Time: 13:28	Taken by: AH



Photo 20 Sample DM04SD.

Direction: South	Date: 9/22/11	Time: 13:48	Taken by: AH

TDD Number: 10-01-0006
Photographed by: Linda Costello (LC), Ada Hamilton (AH)



Photo 21 View of Jordan Creek upstream of background sample DM04SD.

Direction: North *Date: 9/22/11* *Time: 13:49* *Taken by: AH*

9 Unnamed Gulch

It was suspected that a source of metals loading to Jordan Creek may be present near China Creek since a sediment sample collected during the EPA SI from Jordan Creek approximately 50 feet upstream of China Creek contained mercury at a concentration of 10.2 mg/kg, as well as several other metals at concentrations that appear to be elevated with respect to background concentrations based on XRF analysis. A sediment sample also was collected near the mouth of this creek; however, it did not contain elevated concentrations of metals. Additional sediment samples were collected from near the mouth of several upstream gulches, including Barnes Gulch, Tennessee Gulch, Blue Gulch, and Cunningham Creek, none of which contained mercury above the method detection limit. On Jordan Creek, the next nearest upstream sediment sample was located near the Dewey Mine. This location was approximately 1.5 miles upstream of the Jordan Creek sample near China Creek. This sample had a mercury concentration of 3.7 mg/kg. No samples were collected from Jordan Creek between these two points.

A GoogleEarth™ aerial search for possible sources of contamination between the two Jordan Creek samples resulted in the discovery of a surface disturbance approximately one-third of a mile to the west of China Creek near the mouth of an unnamed gulch (Figure 9-1). During the ESI field event, this area was viewed from the ground and found to contain two tailings piles (Figure 9-2). One pile consists of a mound of grayish tailings and a mound of reddish tailings that are contiguous, essentially creating one pile on the western bank of the unnamed gulch (Photographs 14 and 15). A second, smaller pile of reddish tailings is located across the unnamed gulch on its eastern bank.

During the ESI field event, START personnel walked the length of this gulch in an attempt to locate signs of milling equipment or mining activities. Immediately above the tailings piles, a piece of metal with bolts was discovered in the ground. It was only partially exposed, and attempts to unearth it were not successful. Photographs 12 and 13 depict this metal piece. No other waste rock or tailings piles were observed further up the gulch. Further, no other indications of man-made structures or mining equipment were present.

The larger tailings pile measures approximately 70 feet long by 50 feet wide and varies in height from 12 to 20 feet. The second tailings pile is approximately 10 percent of this size. Both piles front the unnamed gulch.

Tailings are in contact with the unnamed gulch. This gulch was dry at the time of sampling. The gulch forks just upgradient of the tailings piles. The larger tailings pile is in contact with both forks of this gulch. From this location, the gulch travels approximately 150 feet (i.e., 0.03 miles) to Jordan Creek. Jordan Creek

has an estimated flow rate of 15 cfs at this confluence. The entire 15-mile TDL is contained within Jordan Creek (Figure 9-3). Fishing is known to occur on Jordan Creek wherever deep pools of water exist (Nelson 2011a). No such pools were observed in the immediate vicinity of the site. The nearest wetland to the site is a PSSC wetland located approximately 1 mile downstream of the PPEs. Approximately 3.7 miles of wetland frontage is present on Jordan Creek within the 15-mile TDL.

9.1 Geologic Features

The ore body source for the tailings piles is not known.

9.2 Site Ownership

The tailings piles are on the patented mining claim of the Chipmunk Mining Company (Endicott 2011; BLM 2010a). No other ownership information for this area was located. Figure 9-4 provides current ownership.

9.3 Site History

The history of the site is not known. Available reference materials do not provide information about this location.

9.4 Previous Mine Sampling

No known sampling has been conducted at this site.

9.5 ESI Sampling

The larger tailings pile was sampled during the ESI field event, as were the unnamed gulch sediments. Figure 9-5 illustrates these sample locations and corresponding mercury concentrations.

9.5.1 Waste Rock Samples

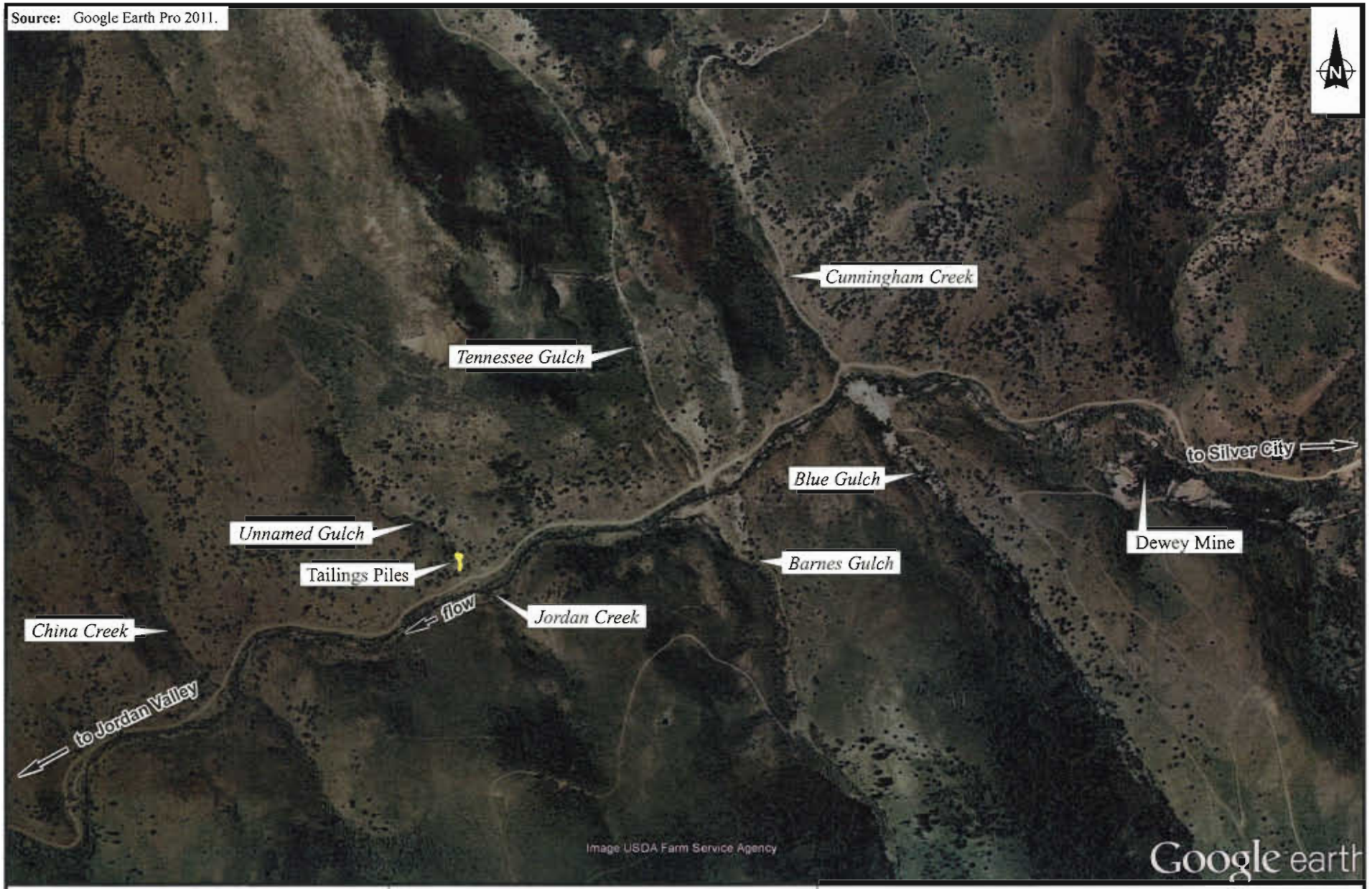
Three tailings samples (CC01SS, CC02SS, and CC03SS) were collected. CC01SS was collected on the top of the reddish portion of the tailings pile, CC02SS was collected near the toe of the reddish portion of the tailings pile, and CC03SS was collected at the toe of the gray portion of the tailings pile. A background sample (BK02SS) of country rock was collected east of the tailings piles.

Sample results are presented in Table 9-1 and indicate the presence of arsenic at a significant concentration with respect to the background concentration in all three samples. Mercury was present at significant concentrations with respect to background concentrations in CC01SS and CC03SS, and silver was present at significant concentrations in CC01SS and CC02SS. Mercury concentrations were 0.57 mg/kg and 0.66 mg/kg. It should be noted that the background sample contained a fairly high concentration of barium.

9.5.2 Sediment Samples

Three sediment samples (CC01SD, CC02SD, and CC03SD) were collected from the dry gulch bed. CC03SD was collected near the mouth of the eastern fork of the unnamed gulch. Sample CC02SD was collected near the downstream end of the larger tailings pile on the eastern fork of the unnamed gulch. Sample CC01SD was collected upstream of the tailings piles as a background sample.

Sample results are presented in Table 9-2 and indicate the presence of arsenic, cadmium, and mercury at elevated concentrations with respect to background concentrations in both sediment samples. Additionally, copper and silver were each elevated in one of sediment samples. Mercury concentrations were 0.14 mg/kg and 1.6 mg/kg. It should be noted that the background sample contained a fairly high concentration of barium.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

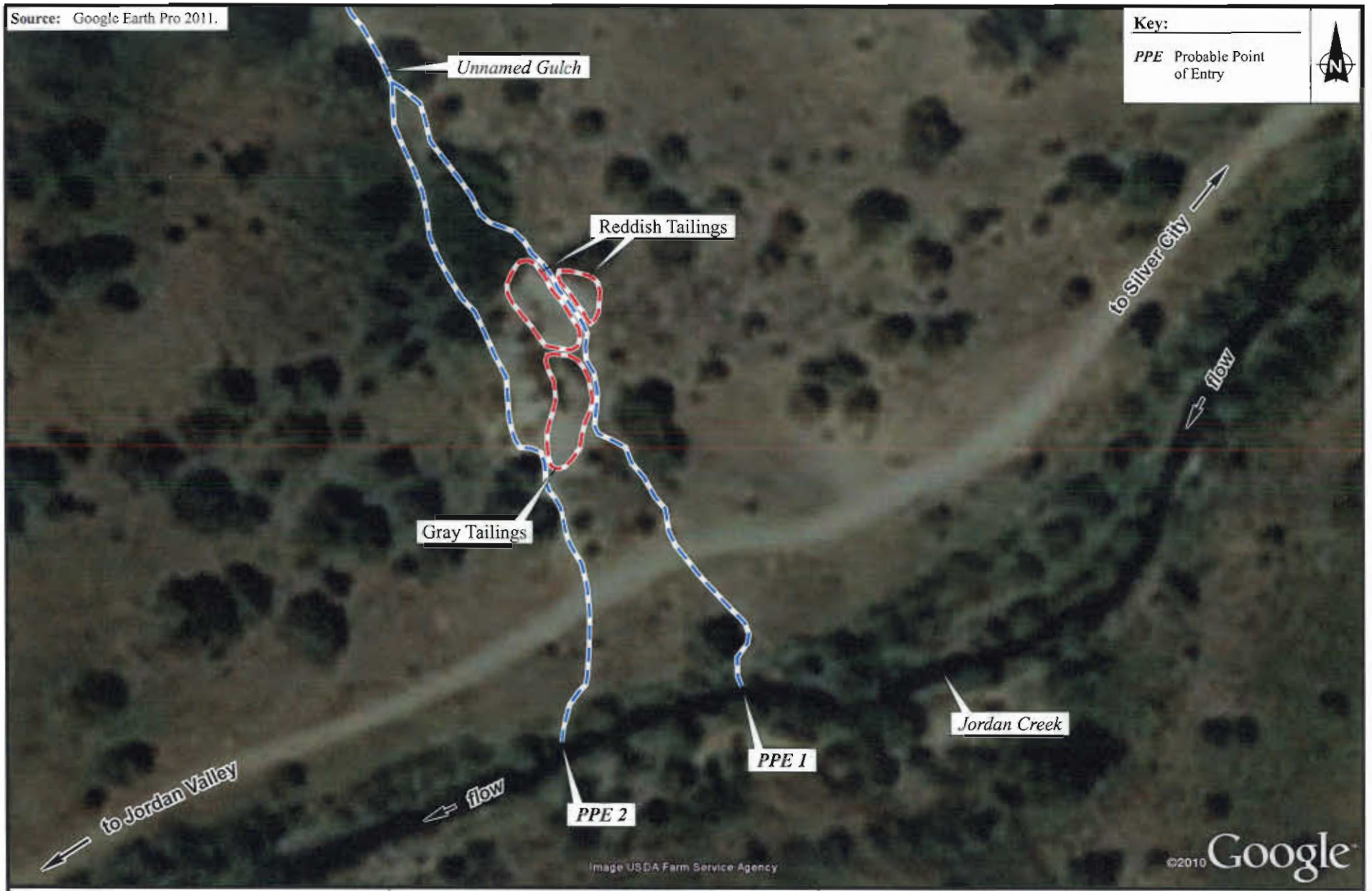
JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 425 850
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 9-1
UNNAMED GULCH SITE VICINITY

Date:	Drawn by:	
12/9/11	AES	10:START-3\10010006\fig 9-1



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 50 100
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 9-2
UNNAMED GULCH TAILINGS PILES SITE MAP

Date:	Drawn by:	
12/13/11	AES	10:START-3\10010006\fig 9-3

This page intentionally left blank.

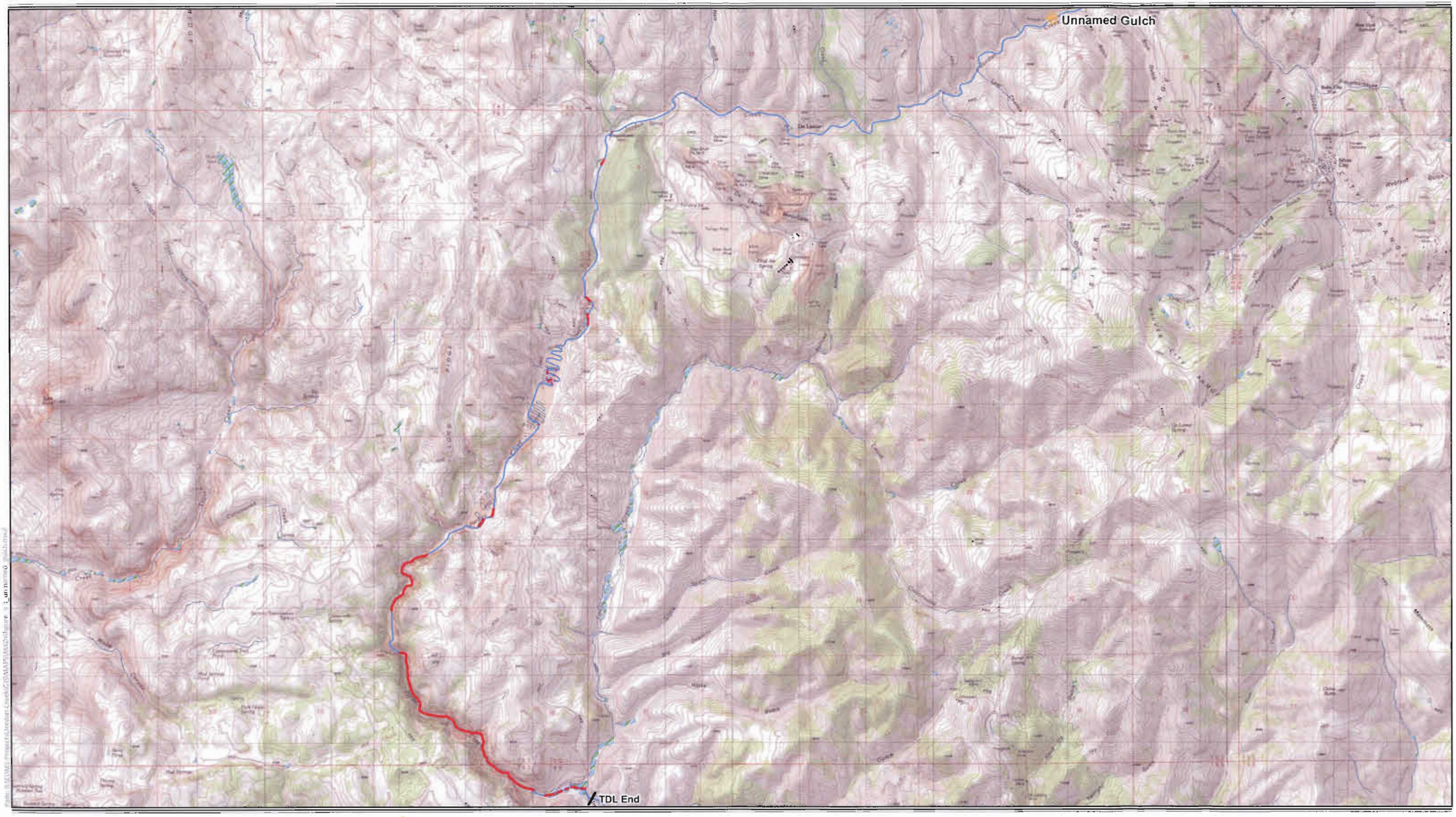


Figure 9-3
Unnamed Gulch Tailings Piles
15-Mile Target Distance Limit Map

Southwest Idaho



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

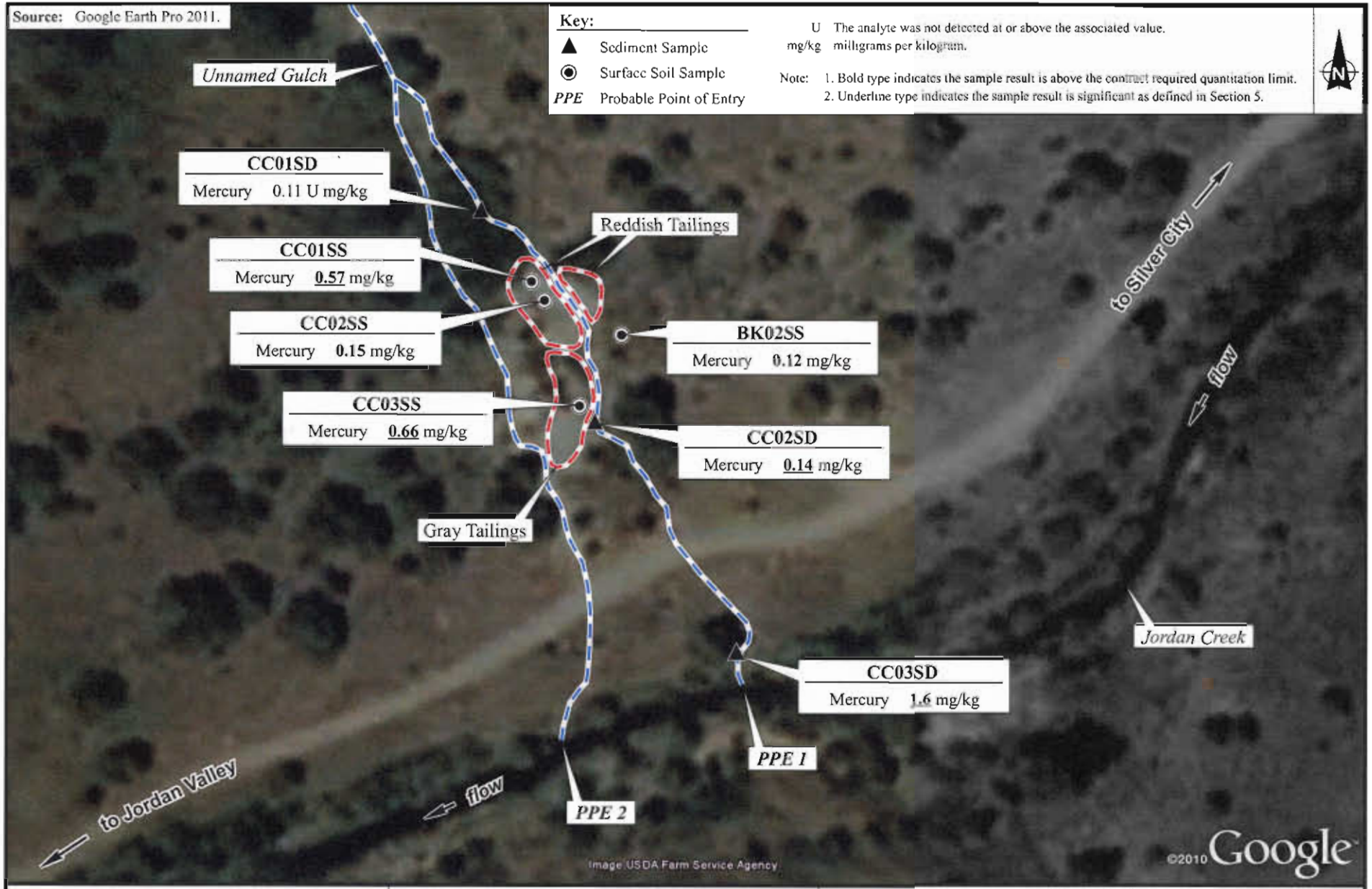
JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 50 100
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 9-4
UNNAMED GULCH OWNERSHIP MAP

Date:	Drawn by:	
12/14/11	AES	10:START-3\10010006\fig 9-4



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 50 100
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 9-5
UNNAMED GULCH SAMPLE LOCATIONS AND MERCURY CONCENTRATIONS MAP

Date: 4/10/12

Drawn by: AES

10:START-3\10010006\fig 9-5

Table 9-1 Unnamed Gulch Tailings Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Location ID	11384312 MJE9A6 BK02SS	11384309 MJE9A3 CC01SS	11384310 MJE9A4 CC02SS	11384311 MJE9A5 CC03SS
Description	**Background**	**Unnamed Gulch Tailings**		
TAL Metals (mg/kg)				
Aluminum	**45800**	**37200**	**35500**	**25200**
Arsenic	**7.3**	**129**	**244**	**103**
Barium	**359**	23.5 JQ	**42.3**	**55**
Beryllium	**1.1**	0.69 U	**0.55**	**0.71**
Cadmium	**1.3**	0.69 U	**0.54**	**0.66**
Calcium	**6040**	**913**	**1470**	**21600**
Chromium	**28.9**	**25.8**	**26**	**29.7**
Cobalt	**47.5**	**24.2**	**19.4**	**29.7**
Copper	**55.6**	**104**	**97.3**	**64.9**
Iron	**129000**	**122000**	**93000**	**82300**
Lead	**6**	**10.4**	**7.6**	**8.8**
Magnesium	**11500**	**12200**	**13500**	**10700**
Manganese	**2150**	**692**	**683**	**1320**
Mercury	**0.12**	**0.57**	**0.15**	**0.66**
Nickel	**49.2**	**33.8**	**30**	**46.3**
Potassium	**6030**	**1110**	**1500**	**898**
Silver	0.97 U	**2.9**	**2.6**	1 U
Vanadium	**195**	**164**	**93.8**	**115**
Zinc	**189**	**132**	**110**	**110**

Note: Bold type indicates the sample result is above the contract required quantitation limit.
Underline type indicates the sample result is significant as defined in Section 5.

Key:

CLP = Contract Laboratory Program
CRQL = Contract Required Quantitation Limit.
EPA = United States Environmental Protection Agency.
ID = Identification.
J = The analyte was positively identified. The associated numerical value is an estimate
mg/kg = milligrams per kilogram
TAL = Target analyte list.
U = The analyte was not detected at or above the associated value

Table 9-2 Unnamed Gulch Sediment Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Location ID	11384315 MJE9A9 CC01SD	11384314 MJE9A8 CC02SD	11384313 MJE9A7 CC03SD
Description	**Background**	**Unnamed Gulch**	
TAL Metals (mg/kg)			
Aluminum	**18700**	**25500**	**27000**
Antimony	5.9 UJL	5.6 UJL	5.6 UJL
Arsenic	**12**	**98.2**	**76.3**
Barium	**185**	**94**	**139**
Beryllium	**0.87**	**0.77**	**0.9**
Cadmium	0.49 U	**0.64**	**0.78**
Calcium	**3470**	**2590**	**4860**
Chromium	**20.4**	**22.8**	**24.4**
Cobalt	**20.2**	**21.6**	**24.5**
Copper	**19.4**	**61**	**48.2**
Iron	**44000**	**72500**	**74200**
Lead	**9.2**	**7.3**	**11.1**
Magnesium	**5990**	**9050**	**8430**
Manganese	**932**	**780**	**1010**
Mercury	0.11 U	**0.14**	**1.6**
Nickel	**23.2**	**27.9**	**31.9**
Potassium	**2690**	**2000**	**2330**
Selenium	3.4 U	3.3 U	3.3 U
Silver	0.98 U	0.93 U	**0.98**
Sodium	490 U	466 U	466 U
Thallium	2.5 U	2.3 U	2.3 U
Vanadium	**61.7**	**84.2**	**105**
Zinc	**113**	**111**	**127**
Grain Size (Percent Retained)			
Percent passing < 3.2 micron sieve	4.5	4.6	7.6
3.2 micron sieve	3.6	1.4	4
7 micron sieve	1.5	1.6	1
9 micron sieve	1.5	1.4	2.5
13 micron sieve	2.7	1.1	2
22 micron sieve	3.9	0.8	2.5
32 micron sieve	6.2	1.4	3
75 micron sieve	4.2	3.1	5
150 micron sieve	3.8	4.6	6.1
250 micron sieve	4.7	9.3	6.8
425 micron sieve	8.2	17	7.9
850 micron sieve	12.3	22.3	14.5
2000 micron sieve	17.6	20.5	18.4
4750 micron sieve	19.1	9.8	16.3
9500 micron sieve	6.1	1.2	2.3
12500 micron sieve	0.1	0.1	0.1
19000 micron sieve	0.1	0.1	0.1
25000 micron sieve	0.1	0.1	0.1
37500 micron sieve	0.1	0.1	0.1
50000 micron sieve	0.1	0.1	0.1
75000 micron sieve	0.1	0.1	0.1

Note:

Bold type indicates the sample result is above the contract required quantitation limit
Underline type indicates the sample result is elevated as defined in Section 5.

Key:

CLP = Contract Laboratory Program
CRQL = Contract Required Quantitation Limit
EPA = United States Environmental Protection Agency
ID = Identification

J = The analyte was positively identified. The associated numerical value is an estimate
L = Low bias
mg/kg = milligrams per kilogram
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL
TAL = Target analyte list.
U = The analyte was not detected at or above the associated value.

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 1 Sample CC01SS from top of waste rock pile.

Direction: Down *Date: 9/20/11* *Time: 11:12*



Photo 2 Sample CC02SS from toe of reddish portion of waste rock pile.

Direction: Down *Date: 9/20/11* *Time: 11:22*



Photo 3 Sample CC03SS from the toe of the gray portion of waste rock pile.

Direction: Down *Date: 9/20/11* *Time: 11:31*



Photo 4 Sample BK02SS from the background location east of Unnamed Gulch.

Direction: Down *Date: 9/20/11* *Time: 11:39*

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 5 Sample CC03SD from the mouth of Unnamed Gulch.

Direction: Down *Date: 9/20/11* *Time: 11:52*



Photo 6 Sample CC02SD from downstream waste rock pile PPE on Unnamed Gulch.

Direction: Down *Date: 9/20/11* *Time: 12:09*



Photo 7 Waste rock toeing into Unnamed Gulch.

Direction: North *Date: 9/20/11* *Time: 12:13*



Photo 8 View from the top of southern portion of waste rock pile. Dirt road and Jordan Creek in background view.

Direction: South *Date: 9/20/11* *Time: 12:17*



Photo 9 Northern portion of waste rock pile toeing into Unnamed Gulch.

Direction: Northeast *Date: 9/20/11* *Time: 12:18*



Photo 10 Sample CC01SD from location upstream of waste rock piles on Unnamed Gulch.

Direction: Down *Date: 9/20/11* *Time: 12:24*



Photo 11 Metal bar with valve or hinge near upstream Unnamed Gulch sample location.

Direction: Down *Date: 9/20/11* *Time: 12:27*



Photo 12 Metal bar with valve or hinge near upstream Unnamed Gulch sample location.

Direction: Down *Date: 9/20/11* *Time: 12:27*



Photo 13 Metal bar with valve or hinge near upstream Unnamed Gulch sample location.

Direction: Down *Date: 9/20/11* *Time: 12:29*



Photo 14 Waste rock piles in Unnamed Gulch.

Direction: Southeast *Date: 9/21/11* *Time: 15:28*

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 15 Waste rock piles in Unnamed Gulch.

Direction: South	*Date: 9/21/11*	*Time: 15:28*

This page intentionally left blank.

10 South Mountain Smelter Slag

The South Mountain Smelter Slag site (referred to as "Old Mine Site" in the EPA SI) is located near South Mountain. The site is accessed via a dirt road known as South Mountain Road. The site contains slag that is present within 7 feet of Williams Creek, a tributary to Jordan Creek (Figure 10-1). The site is mainly characterized by black smelter slag (Photographs 1 and 6). The slag pile is on sloping land and measures approximately 67 feet long by 31 feet wide, with a height of 12 feet on its western side (toward Williams Creek) and 3 feet above the ground surface on its eastern side. In 2000, a pile of timber was described as being present on the north side of the slag pile (IGS 2000); however, this timber no longer is present.

Also, in 2000, a second slag pile was described as being present at the site (IGS 2000). During the ESI field event, this pile was discovered to be burned material rather than slag. This area measures approximately 102 feet long by 100 feet wide on land with a slope of approximately 25 percent. The material is primarily ash and charred wood (Photographs 4, 5, and 11). An attempt was made to dig through the pile to determine whether it rests on slag since this area was formerly described as containing slag; however, only a depth of 2 feet could be reached since the field team did not have a shovel. Neither slag nor native soil was reached.

A surface disturbance is present between the slag pile and the burned material area. This area also contains some burned material and charred wood that may be the remains of the timber pile that was described as being present at the site in 2000.

Three PPEs are present at the site where runoff flows overland from site sources to Williams Creek: one south of the slag pile, one west of the slag pile, and one west of the burned material area. The PPE south of the slag pile is the most upstream PPE. From this location, Williams Creek enters a culvert under South Mountain Road and emerges on the west side of this road, where it is joined by water from an unnamed tributary. From the most downstream PPE (associated with the burned material area), Williams Creek flows approximately 9.77 miles to the north to its confluence with Jordan Creek. From this point, the 15-mile TDL concludes 5.23 miles downstream in Jordan Creek (Figure 10-2). Williams Creek upstream of the confluence has an approximate flow rate of 3 cfs. Below the confluence, the flow rate is approximately 5 cfs. The flow rate of Jordan Creek below the confluence of Williams Creek is estimated at 20 cfs.

Fishing is known to occur on Williams Creek and Jordan Creek within the 15-mile TDL. In 2005, sporting fishing was observed on Williams Creek in the vicinity of the site (IDEQ 2005). The PPEs at the site are in a PSSC wetland. Approximately 7.35 miles of wetland frontage are present on Williams Creek, and 1.53 miles are present on Jordan Creek within the 15-mile TDL (Hanson 2011).

10.1 Geologic Features

The smelter was built on a schist and quartzite unit (IGS 2000). Mining that occurred near the site at Sonnemann Mine (approximately 1 mile to the south) was for lead and silver.

10.2 Site Ownership

The slag pile, portions of the burned material area, and portions of the disturbed area are on the Oregon patented mining claim, whose owner is not known. The rest of the site is on BLM land (Endicott 2011; BLM 2010b). No other ownership information for this area was located. Figure 10-3 provides current ownership boundaries.

10.3 Site History

The site is the former location of a smelter used by mines on South Mountain. The smelter was built in 1874 but closed the following year due to the financial collapse of the Bank of California (IGS 2000).

10.4 Previous Site Sampling

A slag sample collected during the IGS SI contained arsenic at 4,000 mg/kg, cadmium at 18 mg/kg, lead at 16,000 mg/kg, and zinc at 11,000 mg/kg. The slag sample had toxicity characteristic leaching procedure test results for arsenic of 4 mg/L, cadmium of 0.13 mg/L, chromium of 0.061 mg/L, mercury of 0.016 mg/L, and lead of 10 mg/L (IGS 2000).

Two sediment samples collected from Williams Creek near the slag pile during the EPA SI indicated that cadmium, lead, and zinc may be present at elevated concentrations relative to background concentrations based on XRF analysis. Maximum concentrations for each analyte were 189 mg/kg for cadmium, 428 mg/kg for lead, and 3,583 mg/kg for zinc (E & E 1999).

10.5 ESI Sampling

The slag pile and burned material area were sampled during the ESI field event, as were Williams Creek sediments. Figure 10-4 illustrates these sample locations.

10.5.1 Slag Samples

Three samples (SP01SS, SP02SS, and SP03SS) were collected from the slag pile. SP01SS and SP02SS were collected from storm water erosion routes near the base of the slag pile. SP03SS was collected on the top of the slag pile. A background sample (BK01SS) of country rock was collected north of the burned material area.

Sample results are presented in Table 10-1 and indicate the presence of antimony, arsenic, copper, and silver at a significant concentration with respect to the background concentration in sample SP02SS. Sample SP01SS contained antimony at a significant concentration. SP03SS did not contain any metals at significant concentrations. Mercury was not detected in the slag samples.

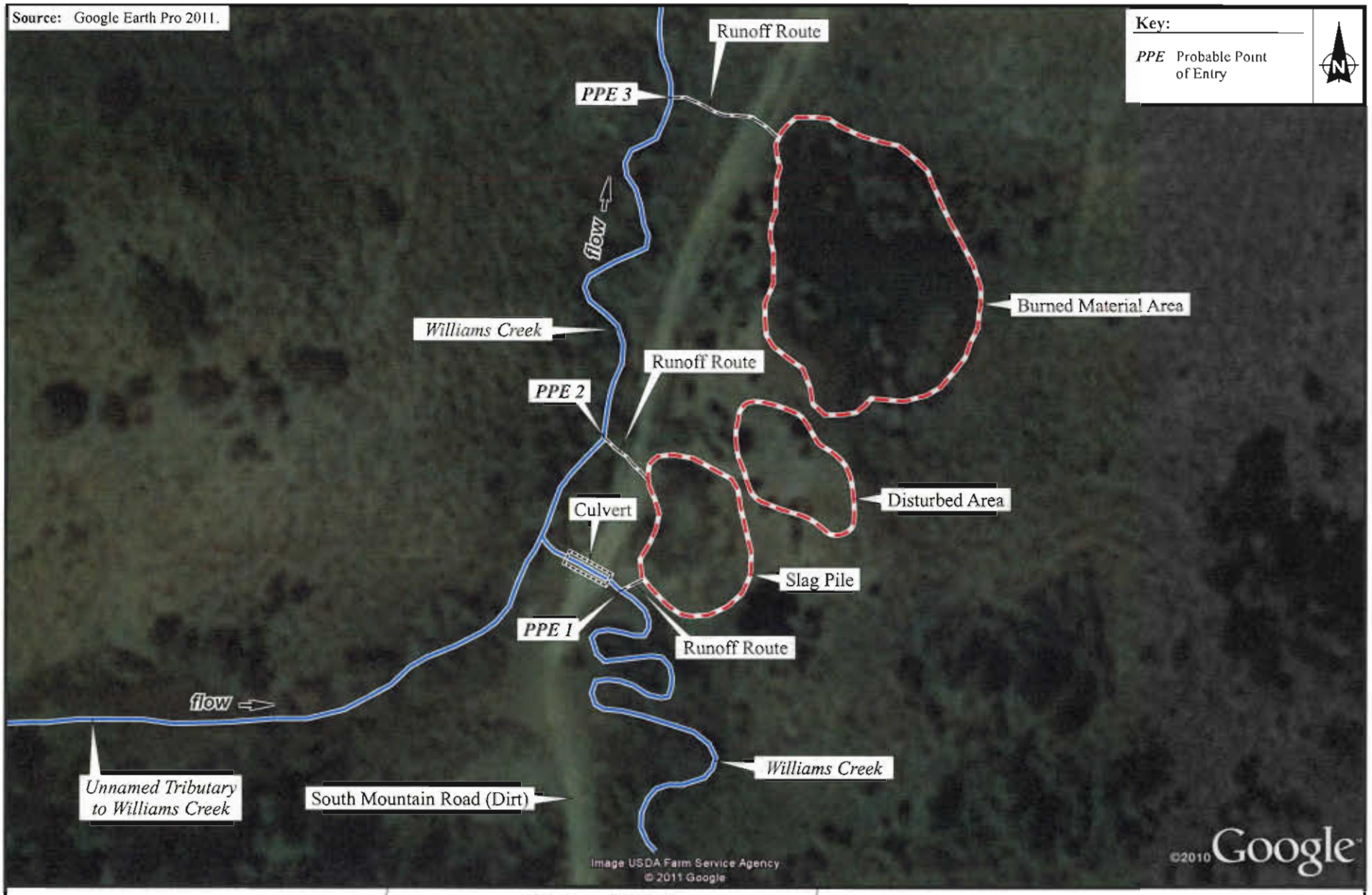
10.5.2 Burned Material Sample

One sample (BA01SS) was collected from the burned material. Sample results are presented in Table 10-1. Antimony was present at a significant concentration with respect to the background concentration.

10.5.3 Sediment Samples

Four sediment samples (WC01SD through WC04SD) were collected from Williams Creek. WC04SD was collected approximately 200 feet downstream of the most downstream slag pile PPE. Sample WC03SD was collected at the most downstream PPE from the slag pile, while WC02SD was collected at the upstream PPE from the slag pile. Sample WC01SD was collected upstream of the slag pile as a background sample.

Sample results are presented in Table 10-2. No analytes were detected at concentrations that were elevated with respect to background concentrations. Mercury was not detected in any sediment sample.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
South Mountain, Idaho

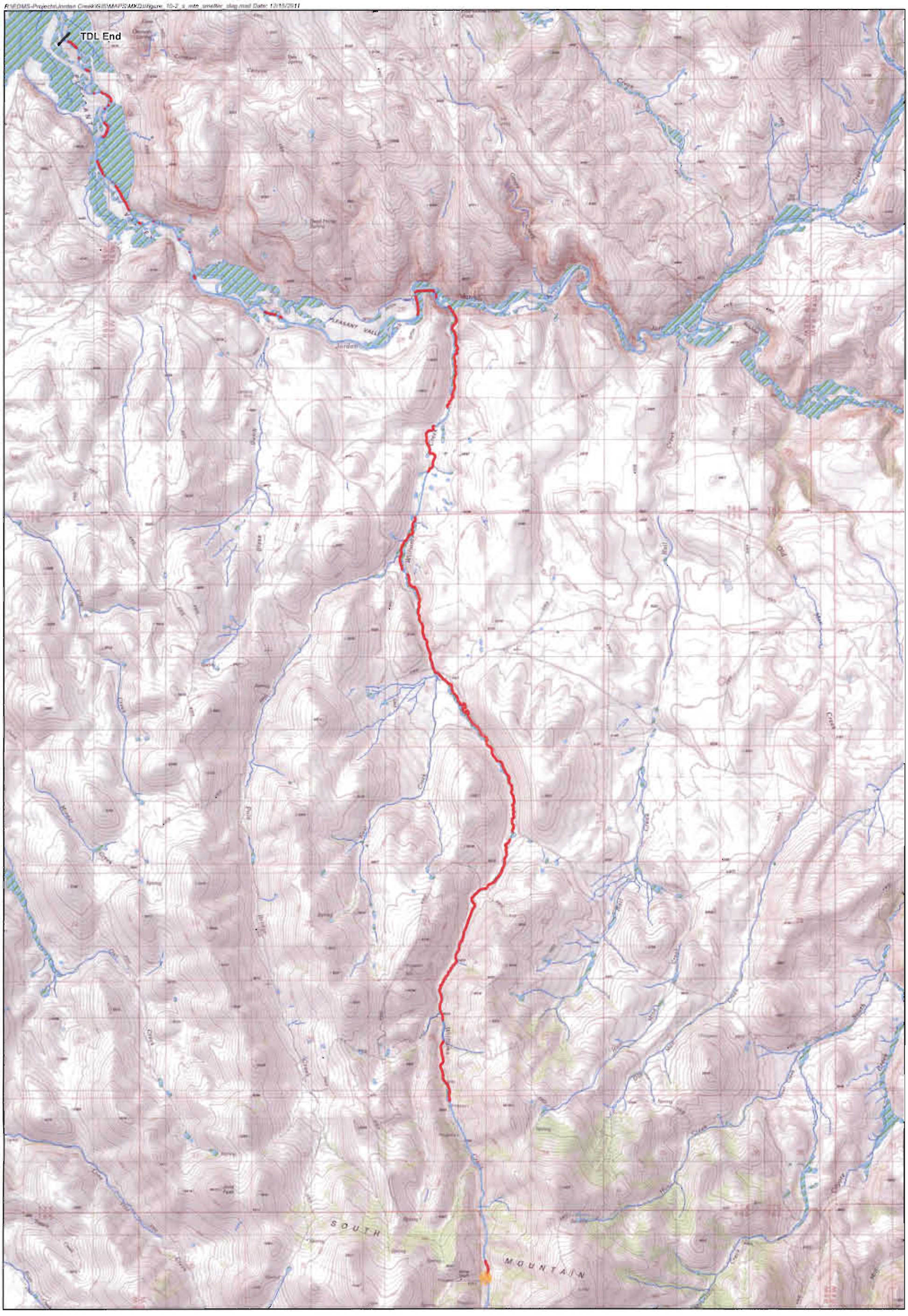
0 55 110
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 10-1
SOUTH MOUNTAIN SMELTER SLAG SITE MAP

Date:	Drawn by:	
12/13/11	AES	10:START-3\10010006\fig 10-1

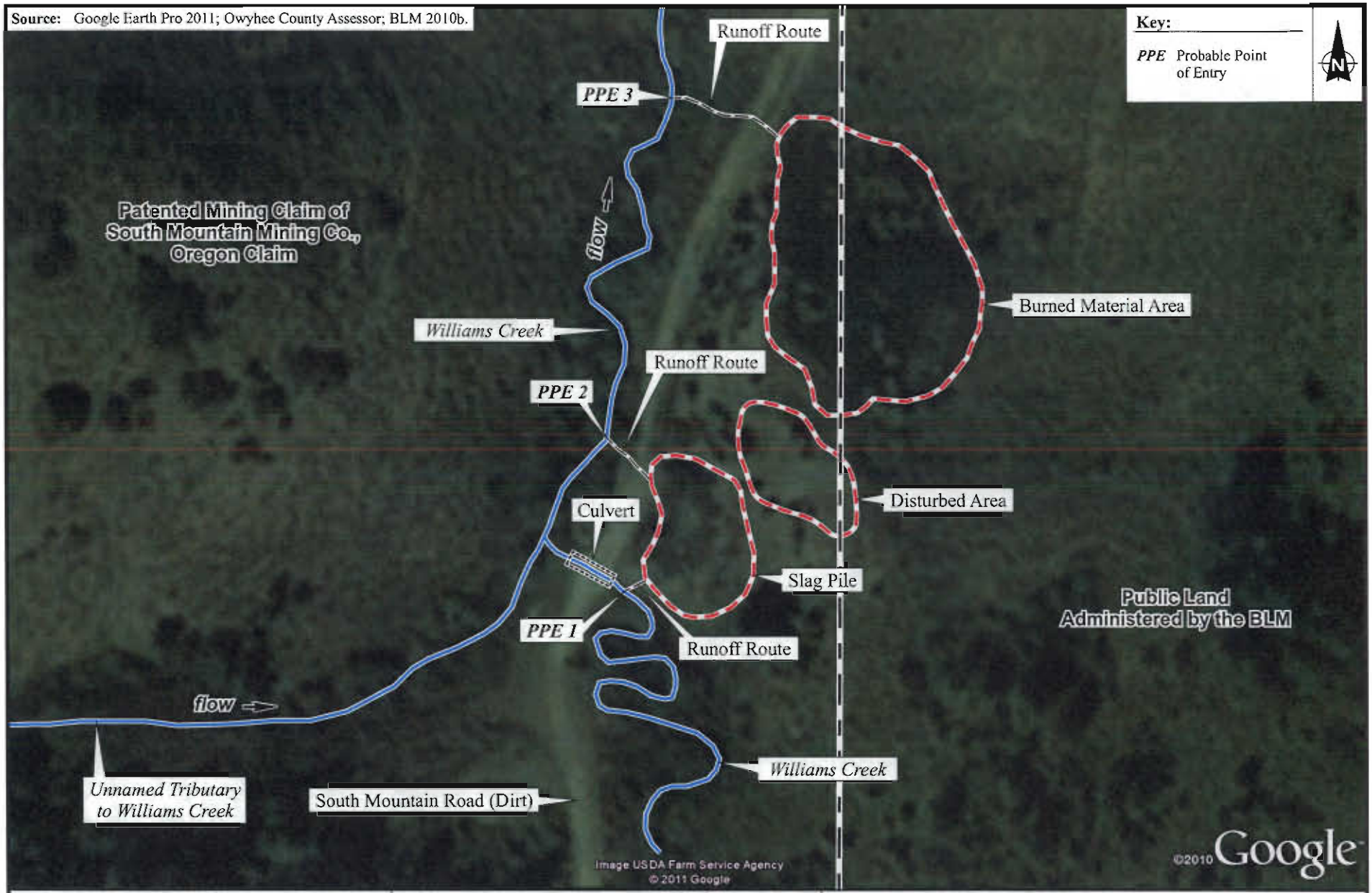
R:\EDMS-Projects\Jordan Creek\GIS\MAPS\MXD\figure_10-2_s_mtn_smelter_slag.mxd Date: 12/15/2011



Source: National Wetlands Inventory - U.S. Fish and Wildlife Service (2011), Topographic Image - ESRI (2010)

Figure 10-2
South Mountain Smelter Slag
15-Mile Target Distance Limit Map

Southwest, Idaho



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
South Mountain, Idaho

0 55 110
Approximate Scale in Feet

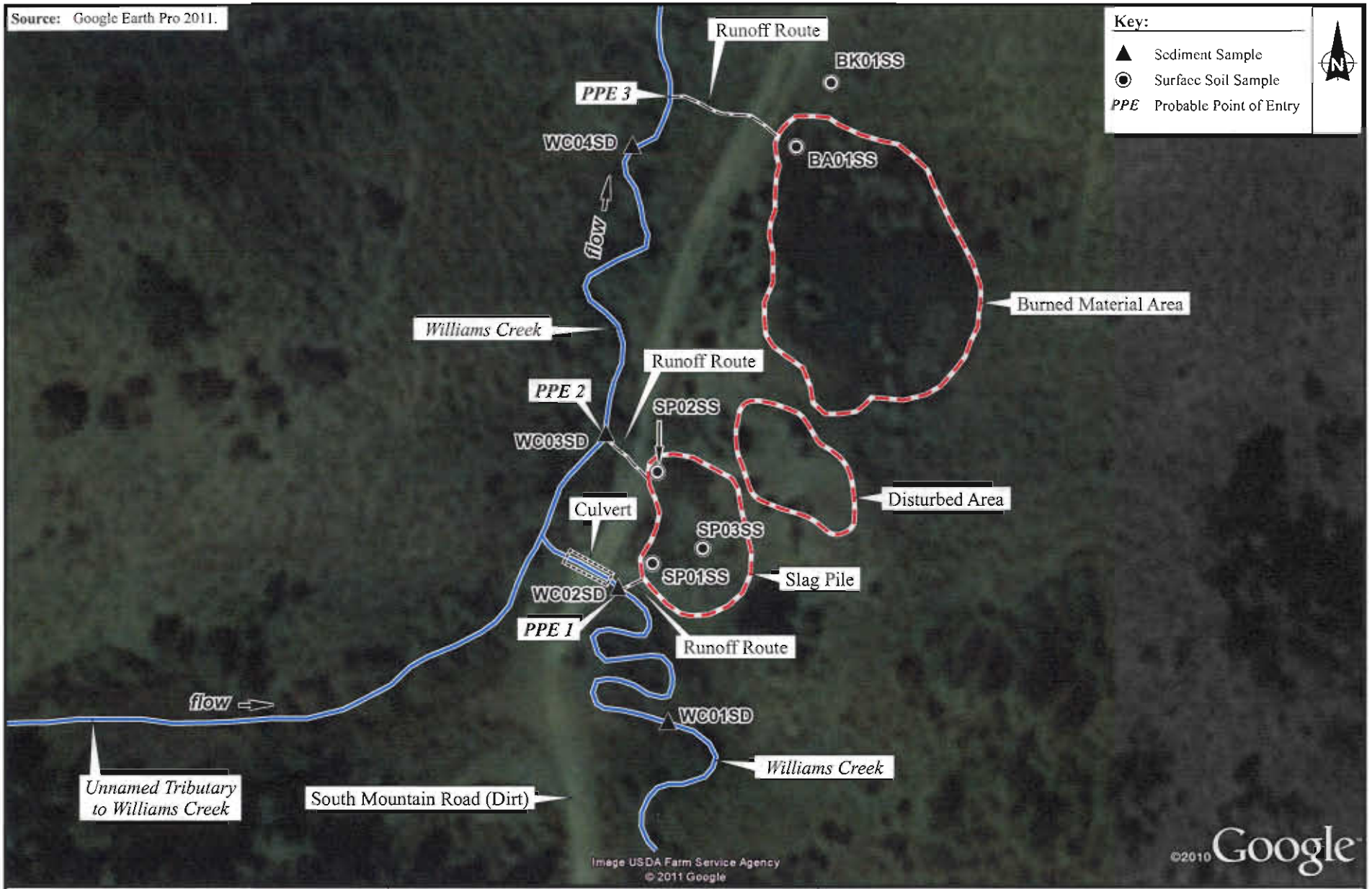
Note: Some features are not to scale.

Figure 10-3
SOUTH MOUNTAIN SMELTER SLAG OWNERSHIP MAP

Date: 12/19/11

Drawn by: AES

10:START-3\10010006\fig 10-3



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
South Mountain, Idaho

0 55 110
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 10-4
SOUTH MOUNTAIN SMELTER SLAG
SAMPLE LOCATIONS

Date: 4/11/12

Drawn by: AES

10:START-3\10010006\fig 10-4

Table 10-1 South Mountain Smelter Slag Samples Analytical Results Summary

EPA Sample ID	11384304	11384300	11384301	11384302	11384303
CLP Sample ID	MJE998	MJE994	MJE995	MJE996	MJE997
Station Location ID	BK01SS	SP01SS	SP02SS	SP03SS	BA01SS
Description	Background	Slag Pile			Burn Area
TAL Metals (mg/kg)					
Aluminum	26400	202	199	103	4490
Antimony	5.2 JQ (SQL = 6.2)	6.7 JL	460	0.49 JQ	7.5 JL
Arsenic	347	278	25500	20.7	432
Barium	196	16.8 U	3.4 JQ	17.9 U	106
Beryllium	1.5	0.42 U	0.46 U	0.45 U	0.2 JQ
Cadmium	20.6	0.076 JQ	0.46 U	0.017 JQ	10.4
Calcium	4550	420 U	459 U	446 U	6820
Chromium	45.5	2	2.9	1.8	5.8
Cobalt	22.5	4.2 U	42.8	4.5 U	4.4 U
Copper	85.6	128	3270	93.9	90.6
Iron	40700	35600	87500	31100	11700
Lead	2100	952	3980	762	2600
Magnesium	6240	527	366 JQ	591	1230
Manganese	1010	228	224	233	232
Mercury	0.12 U	0.096 U	0.093 U	0.085 U	0.11 U
Nickel	96.6	0.31 JQ	10	3.6 U	7.7
Potassium	3770	57.3 JQ	82.3 JQ	33.3 JQ	1320
Silver	7.4	15.7	70.4	7.6	11.9
Vanadium	129	4.4	4.6 U	4.5 U	17.4
Zinc	904	1430	1150	944	547

Note: Bold type indicates the sample result is above the contract required quantitation limit.
Underline type indicates the sample result is significant as defined in Section 5.

Key

CLP = Contract Laboratory Program
CRQL = Contract Required Quantitation Limit
EPA = United States Environmental Protection Agency
ID = Identification.
J = The analyte was positively identified. The associated numerical value is an estimate.
L = Low bias.
mg/kg = milligrams per kilogram.
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL.
SQL = Sample Quantitation Limit.
TAL = Target analyte list.
U = The analyte was not detected at or above the associated value.

Table 10-2 South Mountain Smelter Slag Sediment Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Location ID	11384308 MJE9A2 WC01SD	11384307 MJE9A1 WC02SD	11384306 MJE9A0 WC03SD	11384305 MJE999 WC04SD
Description	**Background**	**Williams Creek**		
TAL Metals (mg/kg)				
Aluminum	**16900**	**15400**	**16300**	**9970**
Arsenic	**111**	**169**	**102**	**57.5**
Barium	**125**	**91.9**	**104**	**56.6**
Beryllium	**0.55**	0.48 JQ	0.49 JQ	0.35 JQ
Cadmium	**15.3**	**15.5**	**15.9**	**8.7**
Calcium	**6750**	**5060**	**6840**	**3560**
Chromium	**29.2**	**28.6**	**24.1**	**19.8**
Cobalt	**13**	**12.6**	**12.7**	**8.1**
Copper	**113**	**94.5**	**77.2**	**54.4**
Iron	**29800**	**27100**	**27600**	**20200**
Lead	**338**	**256**	**373**	**114**
Magnesium	**6880**	**6200**	**5840**	**4200**
Manganese	**626**	**515**	**722**	**373**
Mercury	0.13 U	0.13 U	0.14 U	0.1 U
Nickel	**20.3**	**19.7**	**22.6**	**16.4**
Potassium	**3230**	**2920**	**2370**	**1880**
Silver	**3.5**	**2.5**	**3.2**	**1**
Vanadium	**51.5**	**45.3**	**52**	**43.2**
Zinc	**2290**	**1910**	**1770**	**990**
Grain Size (Percent Retained)				
Percent passing < 3.2 micron sieve	2.5	2.9	1.5	1.2
3.2 micron sieve	1.8	1	1.5	0.6
7 micron sieve	0.7	1.5	0.6	1.5
9 micron sieve	0.4	1	0.6	0.4
13 micron sieve	0.4	1.5	0.9	0.8
22 micron sieve	2.2	2	1.8	1.2
32 micron sieve	4.2	4.3	2.9	2.8
75 micron sieve	11.5	11.9	6.9	5.2
150 micron sieve	12.1	12.4	7.6	6.6
250 micron sieve	13	13.4	8.8	9
425 micron sieve	12.2	11.8	10.7	12.4
850 micron sieve	10	11	14.3	16.7
2000 micron sieve	12.7	11.4	16.3	18.1
4750 micron sieve	9.2	6.4	14.2	18.1
9500 micron sieve	5.3	7.5	5.2	5.4
12500 micron sieve	2	0.1	6.4	0.1
19000 micron sieve	0.1	0.1	0.1	0.1
25000 micron sieve	0.1	0.1	0.1	0.1
37500 micron sieve	0.1	0.1	0.1	0.1
50000 micron sieve	0.1	0.1	0.1	0.1
75000 micron sieve	0.1	0.1	0.1	0.1

Note: Bold type indicates the sample result is above the contract required quantitation limit

Key:

CLP = Contract Laboratory Program
CRQL = Contract Required Quantitation Limit
EPA = United States Environmental Protection Agency
ID = Identification
J = The analyte was positively identified. The associated numerical value is an estimate.
mg/kg = milligrams per kilogram
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL
TAL = Target analyte list
U = The analyte was not detected at or above the associated value.

JORDAN CREEK HISTORIC MINING AREA – EXPANDED SITE INSPECTION
SOUTH MOUNTAIN SMELTER SLAG
Owyhee County, Idaho

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 1 Top of slag pile.

Direction: North *Date: 9/19/11* *Time: 13:05*



Photo 2 South end of slag pile showing proximity to Williams Creek.

Direction: West *Date: 9/19/11* *Time: 13:06*



Photo 3 West side of slag pile showing height of pile.

Direction: Northeast *Date: 9/19/11* *Time: 13:12*



Photo 4 Burned area showing large pieces of burned wood.

Direction: West *Date: 9/19/11* *Time: 13:22*

11-01

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 5 View of burned area from road.

Direction: East *Date: 9/19/11* *Time: 13:39*



Photo 6 Slag pile showing its cemented surface.

Direction: North *Date: 9/19/11* *Time: 14:00*



Photo 7 Sample SP01SS collected from slag pile.

Direction: Down *Date: 9/19/11* *Time: 14:03*



Photo 8 Sample SP02SS of slag material.

Direction: Down *Date: 9/19/11* *Time: 14:14*

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 9 Sample SP03SS of slag from the top of the slag pile.

Direction: Down *Date: 9/19/11* *Time: 14:21*



Photo 10 Sample BA01SS of ash from the burn area.

Direction: Down *Date: 9/19/11* *Time: 14:28*



Photo 11 Sample BA01SS of ash from the burn area.

Direction: Down *Date: 9/19/11* *Time: 14:28*



Photo 12 Sample BK01SS. Background soil sample near South Mountain Smelter Slag pile.

Direction: Down *Date: 9/19/11* *Time: 14:37*



Photo 13 Sample BK01SS. Background soil sample near South Mountain Smelter Slag pile.

Direction: Down *Date: 9/19/11* *Time: 14:38*

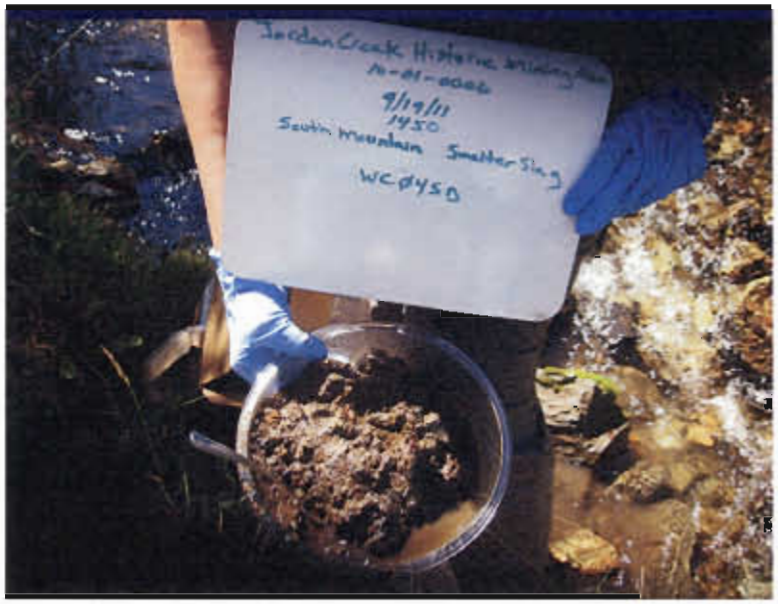


Photo 14 Sample WC04SD collected from most downstream location on Williams Creek.

Direction: Down *Date: 9/19/11* *Time: 14:54*



Photo 15 Sample WC03SD collected from downstream PPE at slag pile.

Direction: Down *Date: 9/19/11* *Time: 15:10*



Photo 16 Sample WC02SD collected from upper PPE at slag pile.

Direction: Down *Date: 9/19/11* *Time: 15:30*

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 17 Sample WC01SD collected upstream of slag pile on Williams Creek at a background location.

Direction: Down *Date: 9/19/11* *Time: 15:35*

This page intentionally left blank.

11 Jordan Creek Mills Upstream of Silver City

In interviews of local residents of Silver City intended to determine likely ongoing sources of mercury contamination to Jordan Creek, one resident expressed a concern that three former stamp mills located upstream of Silver City may be impacting this stream. These are the Cosmos Mill, located near the Silver City campground on the south side of town, and the Poorman and Shorebar Mills, located across from one another on Jordan Creek approximately 0.75 miles upstream of town (Figure 11-1). A ground search to locate these former mills was conducted, though no remains were found. Earlier work by a University of Idaho geology student in 1973 and the IGS in 2000 did locate the Poorman Mill, which was on Jordan Creek just downstream of Sawpit Gulch (Hill 1973; IGS 2000). The condition of the mill was not described in 1973, but in 2000 the mill was described as containing only the rock foundation and concrete footings for the mill, as well as a few pieces of scrap metal. No tailings were found at that time (IGS 2000). The geology student also seems to have located the Shonebar Mill, which was described as containing the remains of an arrastra (Hill 1973). The Shonehar Mill was not visited as a part of the IGS work.

The Cosmos Mill was not visited by either the geology student or the IGS. A prospector found some mercury/gold amalgam near the reported location of the Cosmos Mill (i.e., near the Silver City campground) while panning for gold in September 2011 (Hill 2011).

During this ESI, local residents reported that they had observed elemental mercury near the bank of Jordan Creek at the Masonic Lodge. The Masonic Lodge is located near the south end of Silver City and downstream of the Silver City campground. The lodge building is constructed over Jordan Creek.

Jordan Creek near these mills flows at an approximate rate of 2 to 5 cfs. Approximately 0.44 miles of wetland frontage is present between the most upstream mills and Silver City. In addition, approximately 4.86 miles of wetland frontage are present on Jordan Creek within 15 miles downstream of the Cosmos Mill (Hanson 2011). Livestock make use of this stream segment for watering. Fishing is known to occur on Jordan Creek wherever deep pools of water occur. These pools are known to exist within the 15-mile TDL (Nelson 2011a).

11.1 Geologic Features

The IGS SI describes the Poorman Mill as being present on land underlain by Cretaceous granitic rocks (IGS 2000). The former Shonebar Mill, reportedly located across Jordan Creek from the Poorman Mill, would have been located on

the same type of rock. The Cosmos Mill can also be expected to have been located on Cretaceous granite, given the similar geologic setting of this mill's location.

11.2 Site Ownership

Ownership of the Poorman Mill was not discussed in the IGS SI report, but given its location near a farm and horse pasture, it appears to be on private land (IGS 2000). Ownership of the former Cosmos and Shonebar mills is not known.

11.3 Site History

The Poorman Mill began operations in 1895 with a 10-stamp mill and was constructed on the location of the former Leonard Mill (IGS 2000). The Leonard Mill was constructed by Mr. Leonard in 1871 (LPC 1899). It was located 1.5 miles below the mines it served and had a wire cable tramway to transport ore from mining locations to the mill (IGS 2000; POA 1898).

Information regarding the history of the Shonebar Mill was not found during research conducted for this ESI. START investigators did locate a reference to the construction of an arastra mill in 1864 that later was developed into a 5-stamp mill by a Mr. Shonebar at a location described as being one mile southeast of Silver City, but it could not be determined whether these mills are one and the same (POA 1898).

The Cosmos Mill opened in February 1866 and was a 10-stamp mill (POA 1898).

11.4 Previous Site Sampling

Although the Poorman Mill was visited during the IGS SI, it was not sampled (IGS 2000). In 1973, the Poorman Mill was sampled as a part of the study of mercury contamination in the Jordan Creek Drainage by a geology student at the University of Idaho. Seven soil samples contained mercury above the detection limit of 0.1 ppm. Mercury concentrations in these samples ranged from 8.38 to 140 ppm (i.e., mg/kg) (Hill 1973).

Also during the 1973 mercury study, an arrastra mill was sampled across Jordan Creek from the Poorman Mill. This may have been the Shonebar Mill, which has been described as being present in this area and as possibly being an arrastra mill. Six soil samples contained mercury above the detection limit of 0.1 ppm. Mercury concentrations in these samples ranged from 0.45 to 279 ppm (Hill 1973).

No sampling of the Cosmos Mill is known to have occurred.

During the EPA 1999 SI, sediment samples were collected from Jordan Creek upstream of Silver City at the following locations:

- Samples were collected on either side of Sawpit Gulch, though at the time of this sampling, the possible presence of the Poorman and Shonebar mills near this location was not known. The sample collected on the upstream

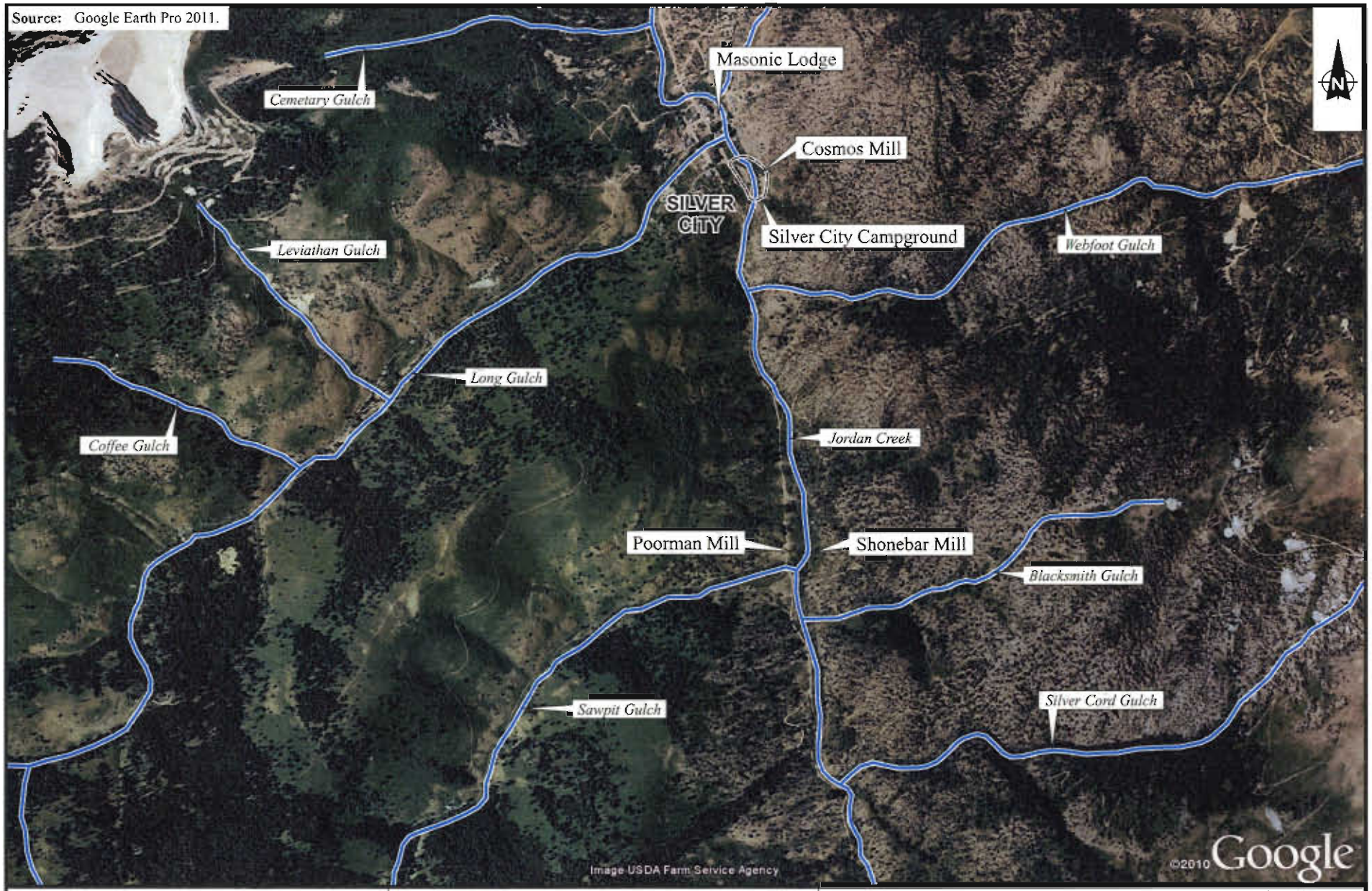
side of this confluence did not contain mercury at a detection limit of 1.3 mg/kg; however, mercury was detected in the sample collected immediately downstream of Sawpit Gulch at 3.3 mg/kg based on XRF analysis.

- One sample was collected on Webfoot Gulch immediately upstream of the confluence with Jordan Creek. This sample contained mercury at a concentration of 1.4 mg/kg based on XRF analysis.
- One sample was collected at the Silver City campground, though at the time of this sampling, the possible presence of the Cosmos Mill near this location was not known. This sample contained mercury at a concentration of 2.0 mg/kg based on XRF analysis.
- One sample was collected immediately upstream of Long Gulch. This sample contained mercury at a concentration of 1.8 mg/kg based on XRF analysis.

11.5 ESI Sampling

The sediments of Jordan Creek were sampled downstream of the mills. A total of four sediment samples (JC01SD through JC04SD) were collected (Figure 11-2). Sample JC01SD was collected upstream of suspected mill locations as a background sample. JC02SD was collected approximately 10 feet downstream of Webfoot Gulch. JC03SD was collected at the Silver City campground, near the suspected former location of the Cosmos Mill. This sample was located approximately 10 feet downstream of an unnamed tributary. JC04SD was collected upstream of the Masonic Lodge and approximately 5 feet upstream of a dirt road crossing through Jordan Creek on the upstream side of the lodge.

Sample results are presented in Table 11-1 and indicate the presence of mercury in samples JC02SD, JC03SD, and JC04SD at elevated concentrations with respect to the background concentration. Mercury concentrations ranged from 0.23 to 0.82 mg/kg. Mercury concentrations were higher at downstream locations. In addition, chromium was detected at an elevated concentration in JC02SD, though the source of chromium at this location is not known.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 875 1750
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 11-1
JORDAN CREEK MILLS SITE MAP

Date:	Drawn by:	
4/10/12	AES	10:START-3\10010006\fig 11-1

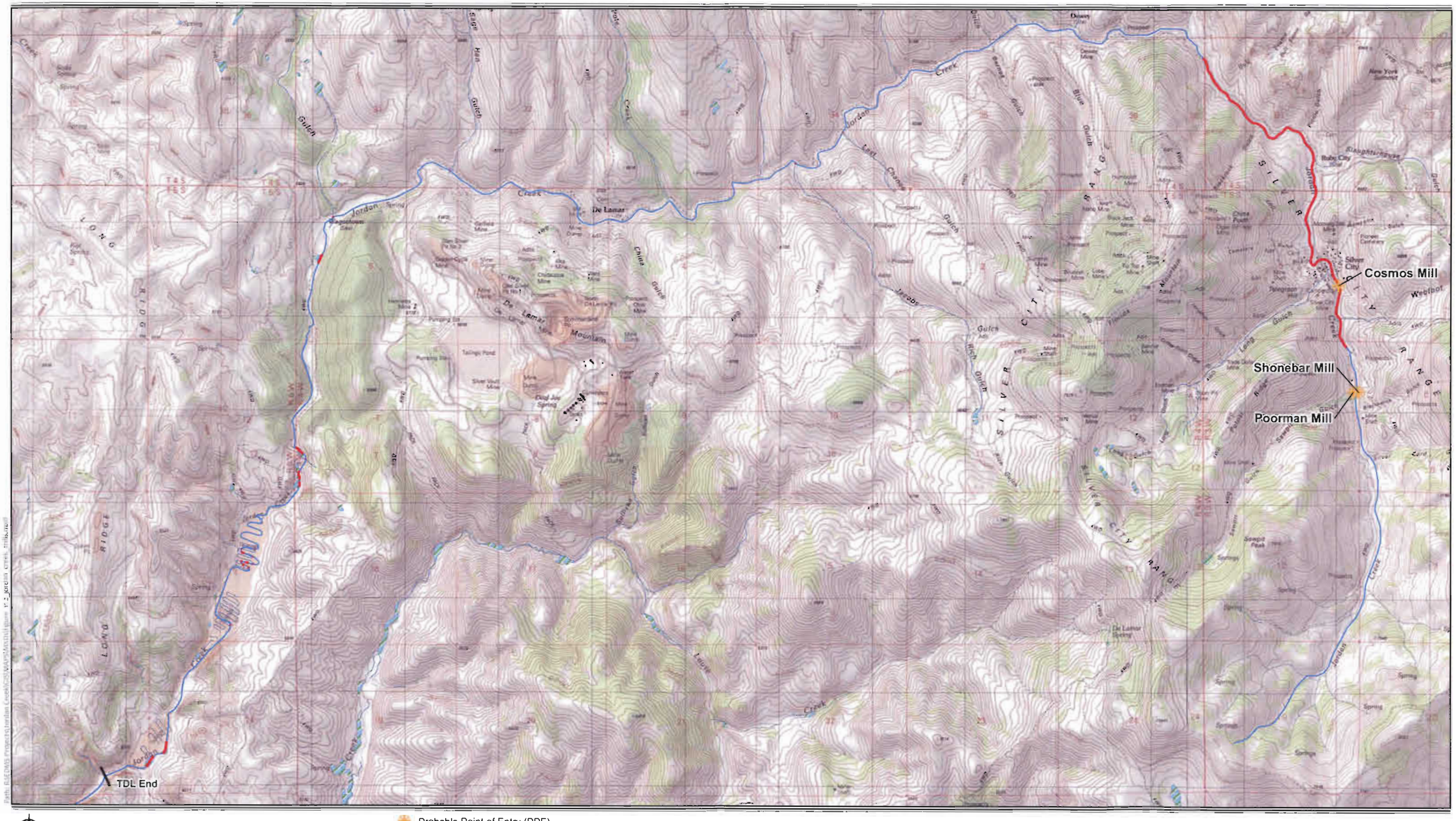
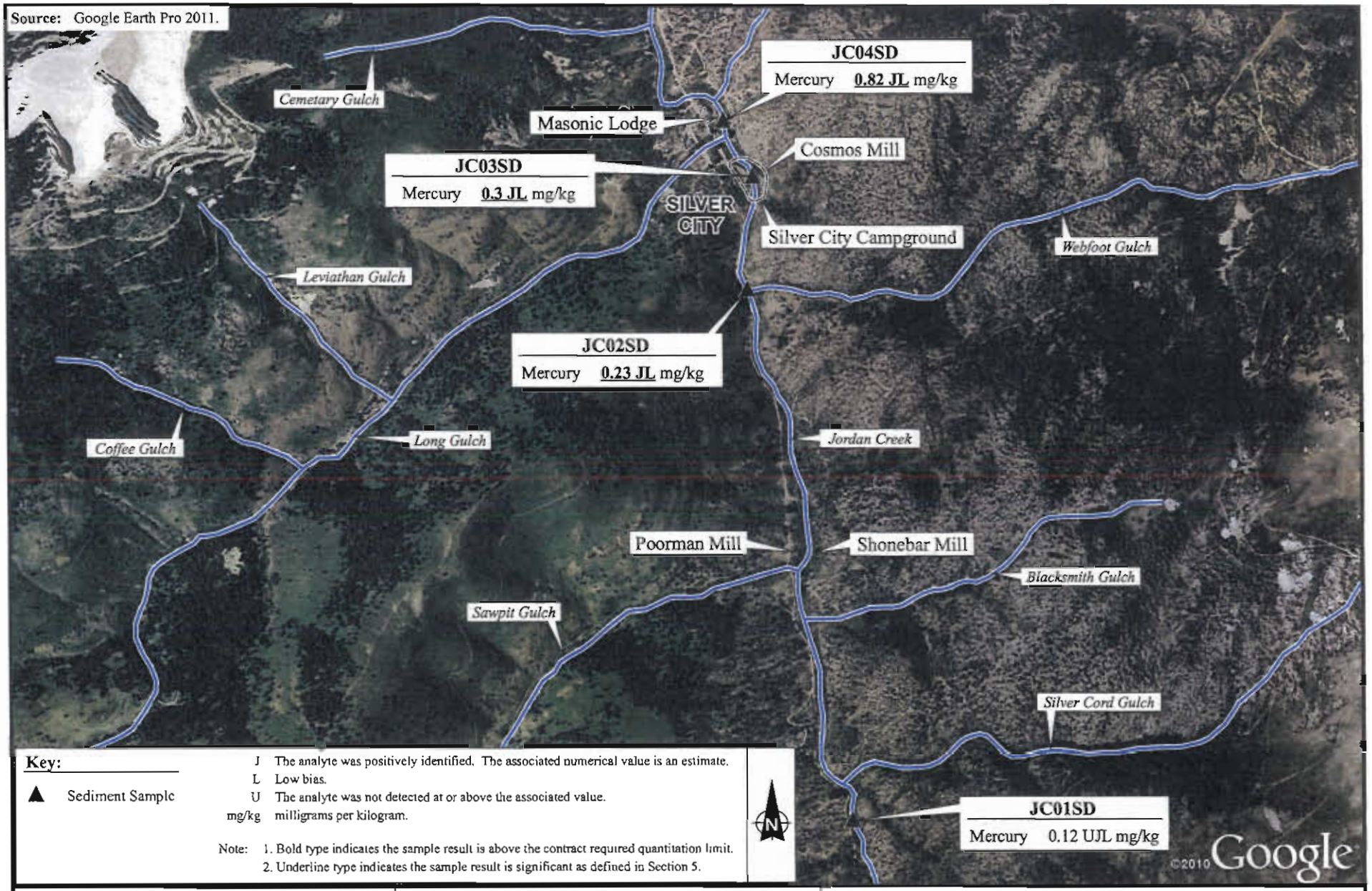


Figure 11-2
Jordan Creek Mills
15-Mile Target Distance Limit Map

Southwest Idaho



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 875 1750
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 11-3
JORDAN CREEK SEDIMENT SAMPLE LOCATIONS AND MERCURY RESULTS

Date: 4/10/12

Drawn by: AES

10:START-3\10010006\fig 11-3

Table 11-1 Jordan Creek Mills Sediment Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Location ID	11384330 MJE9C4 JC01SD	11384331 MJE9C5 JC02SD	11384332 MJE9C6 JC03SD	11384333 MJE9C7 JC04SD
Description	Background	Jordan Creek		
TAL Metals (mg/kg)				
Aluminum	**3590**	**2810**	**2830**	**1880**
Arsenic	**10.6 JH**	**1.7 JH**	**12.4 JH**	**2.5 JH**
Barium	**42.3 JK**	25.8 UJK	**28 JK**	20.6 UJK
Calcium	**625 JK**	645 UJK	**909 JK**	516 UJK
Chromium	1.2 UJK	**4.3 JK**	1.2 UJK	1 UJK
Copper	1.7 JQ (6.2 SQL)	2.3 JQ	**4.7**	2.J JQ
Iron	**4870**	**5820**	**4300**	**3100**
Lead	**2.3 JH**	1.1 JQ	**5.8 JH**	**2.3 JH**
Magnesium	**766 JK**	**730 JK**	484 JQ	398 JQ
Manganese	**145**	**167**	**127**	**75.4**
Mercury	0.12 UJL	**0.23 JL**	**0.3 JL**	**0.82 JL**
Potassium	**892**	473 JQ	455 JQ	379 JQ
Vanadium	6.2 UJK	**8.3 JK**	5.8 UJK	5.2 UJK
Zinc	**25.2**	**17.6**	**26.2**	**18.7**
Grain Size (Percent Retained)				
Percent passing < 3.2 micron sieve	0.8	0.4	0.5	0.4
3.2 micron sieve	0.3	0.1		0.2
7 micron sieve	0.3	0.2	0.3	0 1
9 micron sieve	0.1	0.2	0.1	0.1
13 micron sieve	0.3	0.1	0.1	0.1
22 micron sieve	0.5	0.2	0.3	0.1
32 micron sieve	0.1	0.2	0.1	0 1
75 micron sieve	1 1	0.5	0.5	0.4
150 micron sieve	3.9	1.7	1.9	1.5
250 micron sieve	9.6	6.7	8.6	5.9
425 micron sieve	17.9	17	25 5	14.3
850 micron sieve	41 6	32.5	38.9	24.6
2000 micron sieve	21.4	36.6	16.3	34
4750 micron sieve	2.1	3.7	6.1	14.9
9500 micron sieve	0.1	0.1	1	2.6
12500 micron sieve	0.1	0.1	0.1	1
19000 micron sieve	0.1	0.1	0.1	0.1
25000 micron sieve	0.1	0.1	0.1	0.1
37500 micron sieve	0.1	0.1	0.1	0.1
50000 micron sieve	0.1	0.1	0.1	0.1
75000 micron sieve	0.1	0.1	0.1	0.1

Note: Bold type indicates the sample result is above the contract required quantitation limit.
Underline type indicates the sample result is elevated as defined in Section 5.

Key

CLP = Contract Laboratory Program.
CRQL = Contract Required Quantitation Limit.
EPA = United States Environmental Protection Agency
H = High bias
ID = Identification.
J = The analyte was positively identified. The associated numerical value is an estimate.
K = Unknown bias.
L = Low bias
mg/kg = milligrams per kilogram
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL
SQL = Sample Quantitation Limit
TAL = Target analyte list.
U = The analyte was not detected at or above the associated value

TDD Number: 10-01-0006
Photographed by: Linda Costello



Photo 1 Background sediment sample from Jordan Creek. JC01SD.

Direction: East *Date: 9/21/11* *Time: 10:17*



Photo 2 Sample JC02SD from Jordan Creek just downstream of tributary (Webfoot Gulch) and disturbed area.

Direction: Down *Date: 9/21/11* *Time: 11:09*



Photo 3 Sample JC03SD from Jordan Creek ~10 feet downstream of tributary at Silver City campground.

Direction: Down *Date: 9/21/11* *Time: 11:35*



Photo 4 Sample JC04SD from Jordan Creek ~20 feet upstream of the Masonic Lodge in Silver City.

Direction: Down *Date: 9/21/11* *Time: 11:59*

This page intentionally left blank.

12 Silver City Drinking Water

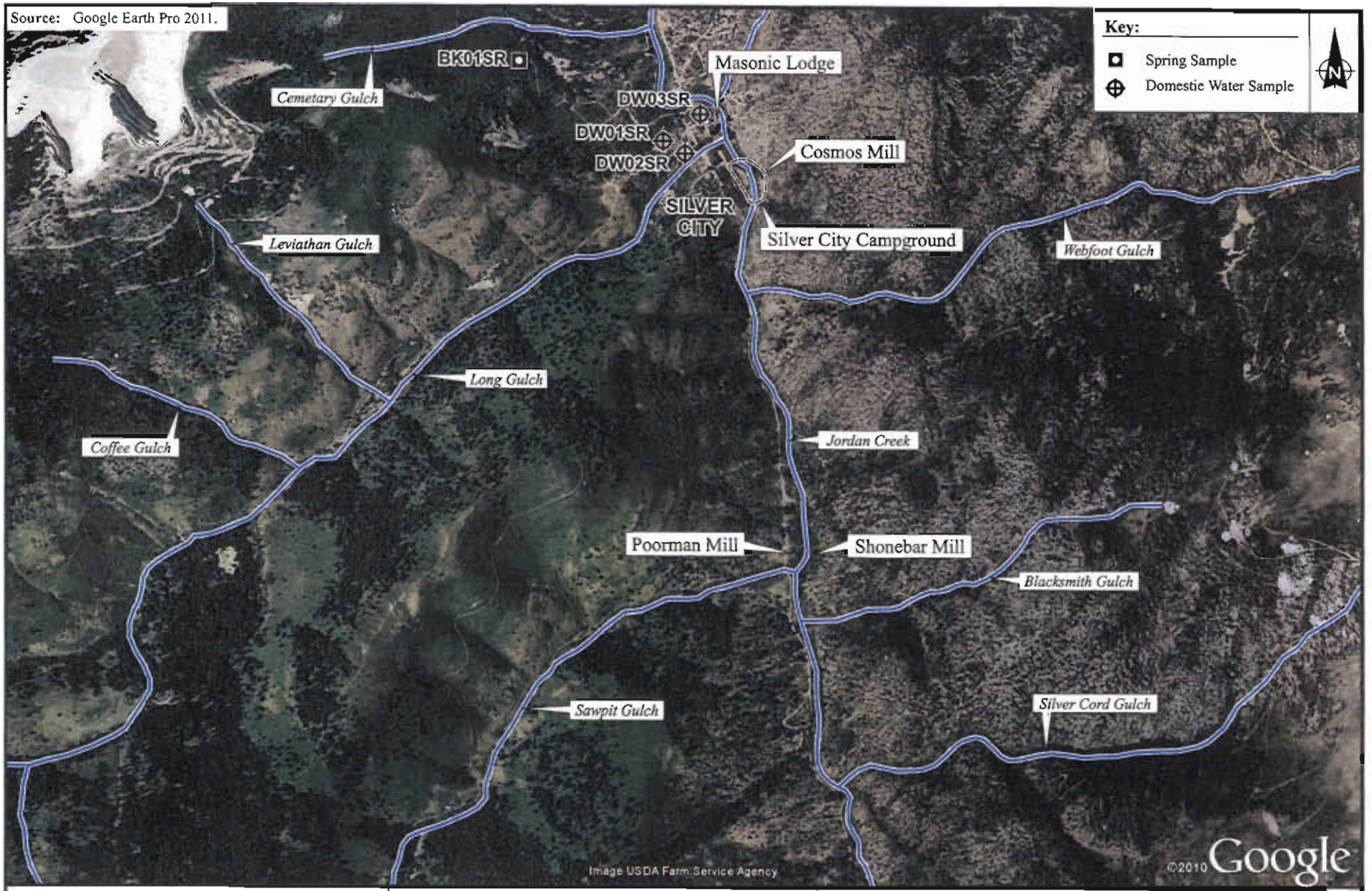
Drinking water for residents and businesses in Silver City is either hauled in or obtained from a nearby spring (Nelson 2011b). The water system fed by the spring is classified as transient, non-community by IDEQ Health District 3 and as such is subject to only limited sampling. Spring water is analyzed quarterly for chloroform between May and September (resulting in two sampling events per year) and once per year for nitrates. The system serves approximately 65 people and 57 connections (IDEQ 2011).

Due to the former presence of a number of stamp mills near Silver City, a decision was made to sample the water in town to determine whether this water supply had been impacted by metals contamination (see SPAF in Appendix A).

12.1 ESI Sampling

The spring that supplies water to Silver City is capped and kept locked. Due to the low flow conditions at the time of sampling, the water master recommended against opening this spring for sampling due to a concern of releasing sediment into the water supply system (Orton 2011). For this reason, three drinking water taps were sampled (DW01SR, DW02SR, and DW03SR). DW01SR was collected from the nearest residence to the spring, DW02SR was collected from a residence close to the spring, and DW03SR was collected from the Idaho Hotel. Each residence is occupied by one person during the summer months. The Idaho Hotel operates from late June through early September and has 13 rooms that can accommodate a maximum of 30 people. Neither of the residential taps had filters on the water supply; however, water at the Idaho Hotel is filtered. No taps are present prior to the filter. The water sample from the hotel was collected at the nearest tap to the water supply. In addition to the tap water samples, a sample was collected from a nearby spring (BK01SR) for use as a background sample. Figure 12-1 depicts these sample locations.

Sample results are presented in Table 12-1 and indicate the presence of copper in samples DW02SR and DW03SR at concentrations that were elevated with respect to the background sample. Copper was detected in DW02SR at 61.9 µg/L and in DW03SR at 65.5 µg/L. These concentrations are well below the EPA Safe Drinking Water Act Maximum Contaminant Level (MCL) for copper of 1,300 µg/L. EPA MCLs are designed to be protective of human health (EPA 2009). Mercury was not detected in any of these samples. The presence of copper may be from copper piping if used in the water system.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

JORDAN CREEK
HISTORIC MINING AREA
Silver City, Idaho

0 875 1750
Approximate Scale in Feet

Note: Some features are not to scale.

Figure 12-1
SILVER CITY DRINKING WATER SAMPLE LOCATIONS

Date: 4/10/12

Drawn by: AES

10:START-3\10010006\fig 12-1

Table 12-1 Silver City Drinking Water Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Location ID	11384337 MJE9D1 BK01SR Background	11384334 MJE9C8 DW01SR	11384335 MJE9C9 DW02SR	11384336 MJE9D0 DW03SR
TAL Metals (µg/L)				
Aluminum	**485**	127 JQ	**234**	48.7 JQ
Copper	25 UJL	25 UJL	**61.9 JL**	**65.5 JL**
Iron	**399**	100 U	100 U	100 U
Mercury	0.2 U	0.2 U	0.2 U	0.2 U

Note: Bold type indicates the sample result is above the contract required quantitation limit.
Underline type indicates the sample result is elevated as defined in Section 5.

Key:

CLP = Contract Laboratory Program.
CRQL = Contract Required Quantitiation Limit.
EPA = United States Environmental Protection Agency.
ID = Identification.
J = The analyte was positively identified. The associated numerical value is an estimate.
Q = The analyte was positively identified. The associated numerical value is above the instrument detection limit but below the CRQL.
U = The analyte was not detected at or above the associated value.
µg/L = Micrograms per liter.

This page intentionally left blank.

TDD Number: 10-01-0006
Photographed by: Ada Hamilton

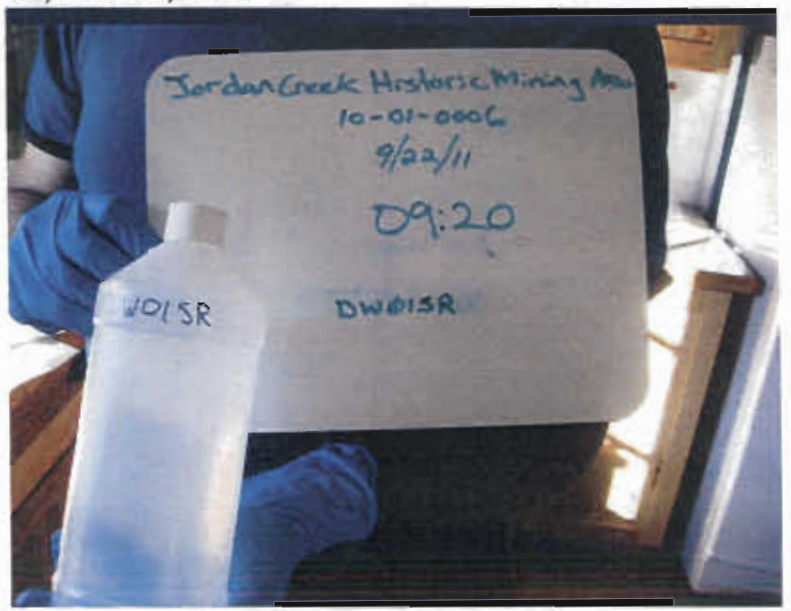


Photo 1 Sample DW01SR.

Direction: Down *Date: 9/22/11* *Time: 09:20*



Photo 2 Residence where DW01SR was collected.

Direction: Northwest *Date: 9/22/11* *Time: 09:29*

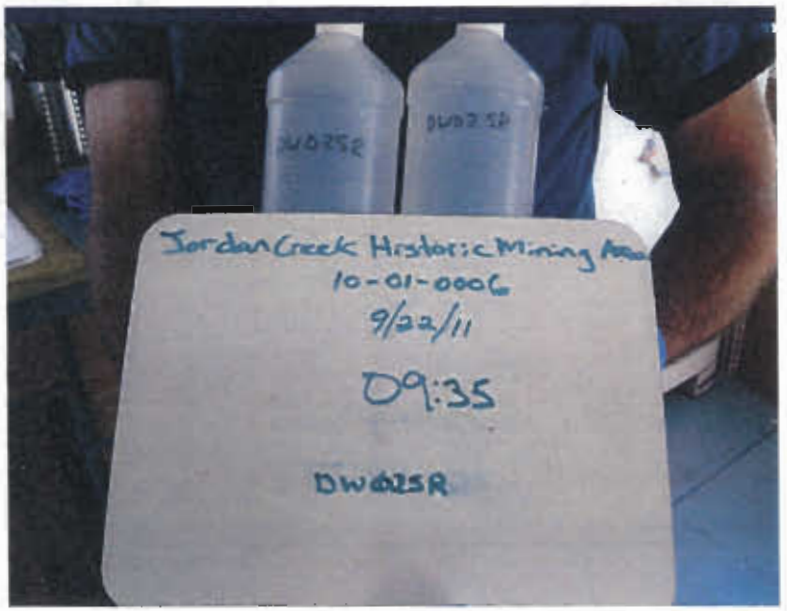


Photo 3 Sample DW02SR.

Direction: Down *Date: 9/22/11* *Time: 09:35*



Photo 4 Residence where DW02SR was collected.

Direction: Southwest *Date: 9/22/11* *Time: 09:42*

TDD Number: 10-01-0006
Photographed by: Ada Hamilton

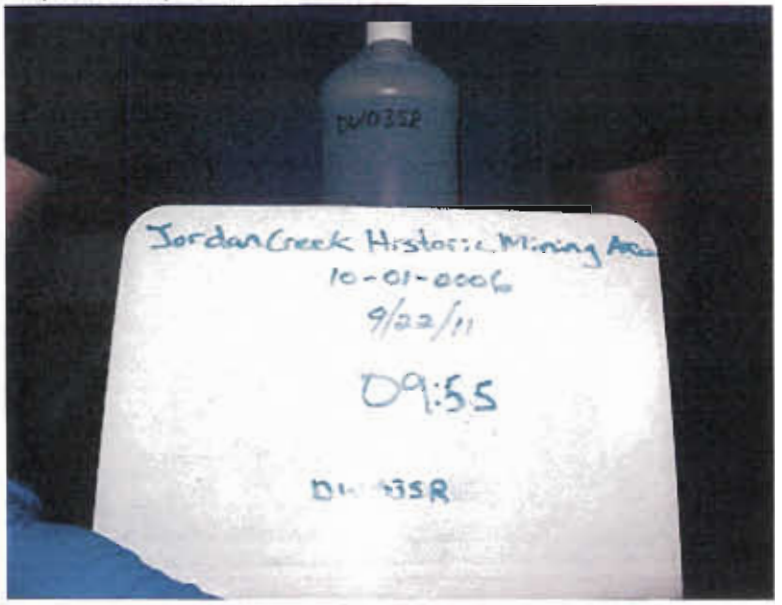


Photo 5 Sample DW03SR.

Direction: Down	Date: 9/22/11	Time: 09:55



Photo 6 Idaho Hotel where DW03SR was collected.

Direction: East	Date: 9/22/11	Time: 09:58



Photo 7 Source of drinking water to Silver City, a covered spring.

Direction: North	Date: 9/22/11	Time: 10:38



Photo 8 Spring at background location BK01SR.

Direction: Down	Date: 9/22/11	Time: 10:41

TDD Number: 10-01-0006
Photographed by: Ada Hamilton

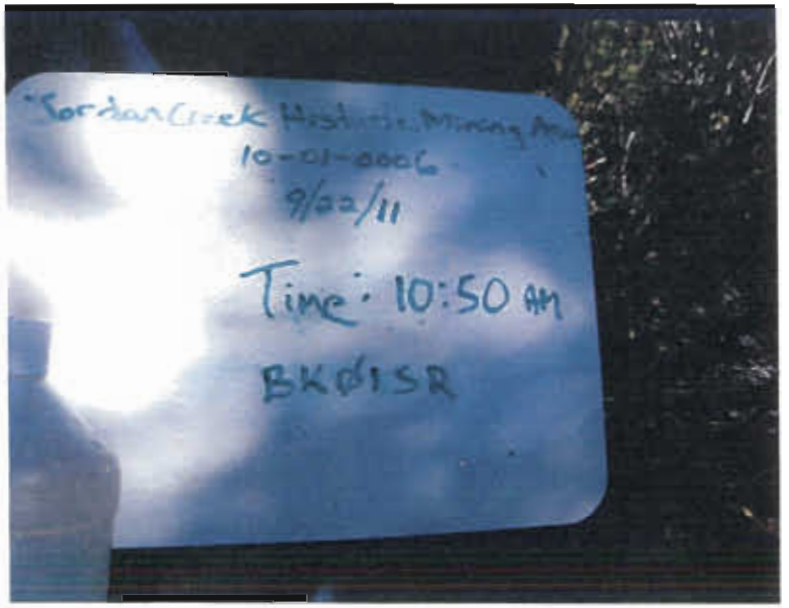


Photo 9 Sample BK01SR.

Direction: Down *Date: 9/22/11* *Time: 10:50*



Photo 10 Upgradient of BK01SR.

Direction: West *Date: 9/22/11* *Time: 10:57*

This page intentionally left blank.

13

Summary

The JCHMA was once a thriving mining district located near the headwaters of Jordan Creek that produced large quantities of gold and silver. The town of Silver City was once the center of this mining district. Prospectors found gold in Jordan Creek in 1863. Mining after 1914 maintained a very low level of production that ended in early 1942.

During historic mining activities, elemental mercury was used in stamp milling, dredge mining, and, to a lesser degree, placer mining for gold. At Silver City, use of the Washoe Pan Process is believed to have resulted in the discharge of large quantities of mercury into Jordan Creek. In placer mining and in arrastra mills, the loss of mercury was not readily controllable due to the necessary water agitation in the process. It has been estimated that placer mining resulted in as much as a 30-percent loss of mercury. The presence of elemental mercury in the stream bed of Jordan Creek has been described by a variety of resources, including mining references and Silver City residents. Elemental mercury in sediment deposits can be expected to be exposed and transported further downstream during periods of high flow.

Redband trout near Silver City have been shown to contain mercury at concentrations above those safe for human consumption. Jordan Creek is a is considered an impaired water body under the Federal Clean Water Act due to the presence of mercury pollution.

The ESI field sampling event was conducted from September 18, 2011, through September 23, 2011. A total of 44 samples, including background samples were collected for the ESI. Samples were collected at the following locations:

- Potosi Mine - Two waste rock piles and sediments of Long Gulch;
- Trade Dollar Mine - One tailings/waste rock pile and sediments of Long Gulch;
- Dewey Mine - Two seeps and sediments of Jordan Creek;
- Unnamed Gulch between Dewey Mine and China Creek - Two tailings piles and sediments of the unnamed gulch;
- South Mountain Smelter - One slag pile, one burned material area, and sediments of Williams Creek;
- Jordan Creek Mills upstream of Silver City – Sediments downstream or near mills; and
- Drinking water in Silver City - Three taps.

All sources sampled (waste rock, tailings, and seeps) contained at least one metal at a significant concentration relative to background concentrations. However, in some areas, particularly at the Potosi Mine and the South Mountain Smelter Slag pile, the concentrations of metals in the background samples of country rock appeared to be reflective of the mineralized zones from which these samples were collected. The same was true of the background sediment samples at these two sites.

Mercury concentrations in waste rock and tailings samples ranged from 0.13 to 0.66 mg/kg. Background mercury concentrations of igneous rock in the Jordan Creek drainage were determined to be 0.206 mg/kg (Hill 1973). The slag and seeps samples did not contain detectable concentrations of mercury. Williams Creek, associated with the South Mountain Slag site, also did not contain detectable concentrations of mercury. Mercury concentrations in the remaining sediment samples (i.e., collected from Jordan Creek and Long Gulch) ranged from 0.14 to 13.3 mg/kg. The highest concentration of mercury was in a PPE sample collected from Long Gulch at the Potosi Mine; however, the background sample for this location contained mercury at 5.4 mg/kg. Samples were collected further upstream of the Potosi Mine near the Trade Dollar Mine. The nearest sediment sample had a much lower concentration of mercury at 0.5 mg/kg. For this reason, the source of mercury in the background Potosi Mine sediment sample is not known, though it should be noted that a rusted mercury flask was observed in Long Gulch between these two sample points.

14 References

BLM (Bureau of Land Management), 2010a, Murphy Surface Management Status, 1:100,000-Scale Topographic Map, Murphy, Idaho.

_____, 2010b, Triangle Surface Management Status, 1:100,000-Scale Topographic Map, Triangle, Idaho.

_____, 1995, *Mine Reconnaissance and Inventory.*

E & E (Ecology and Environment, Inc.), September 2011a, *Sampling and Quality Assurance Plan, Jordan Creek Historic Mining Area, Silver City, Idaho.*

_____, May 18 through September 22, 2011b, Jordan Creek Historic Mining Area field logbook, TDD 10-01-0006.

_____, revised October 7, 2010, memorandum from Linda Costello regarding the *Sampling Strategy for ESI Work at the Jordan Creek Historic Mining Area* to Ken Marcy, United States Environmental Protection Agency, Task Monitor.

_____, September 2000, *Dewey Mine Site Inspection* prepared for the United States Environmental Protection Agency.

_____, July 28, 1999, *Site Inspection Report, Jordan Creek Watershed – Phase I, Malheur County, Oregon, and Owyhee County, Idaho,* prepared by Ecology and Environment, Inc. for the United States Environmental Protection Agency.

Endicott, Brett, August 16, 2011 and December 13, 2011, Owyhee County Assessor, Murphy, Idaho, telephone conversations with Derek Pulvino, Ecology and Environment, Inc., Seattle, Washington regarding ownership of selected mines.

EPA (United States Environmental Protection Agency), Office of Water, August 2011, *Draft Total Maximum Daily Load for Mercury in the Waters of Jordon Creek, Idaho.*

_____, January 2010a, *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-Media, Multi-Concentration, ISM01.2.*

_____, January 2010b, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*, OSWER 9240.1-51, EPA 540-R-10-011.

_____, May 2009, National Primary Drinking Water Regulations, Maximum Contaminant Levels, webpage http://water.epa.gov/drink/contaminants/index.cfm#List, accessed March 2012.

_____, August 2000, *Guidance for the Data Quality Objectives Process,* EPA QA/G-4, Office of Research and Development, Washington, D.C., EPA/600/R-96/055.

Hanson, Alan, December 15, 2011, Ecology and Environment, Inc., GIS Analyst memorandum to Linda Costello, Ecology and Environment, Inc. Project Manager regarding Jordan Creek Historic Mining Area, National Wetlands Inventory.

Hill, Mark, October 2011, summary of email correspondence to Linda Costello, Ecology and Environment, Inc. regarding mercury found in Jordan Creek.

Hill, Steve, 1973, College of Mines, University of Idaho, *Study of Mercury and Heavy Metals Pollutants in the Jordan Creek Drainage.*

Hyslop, Jim, January 17, 2006, *Mercury Used in Mining in the Area near Silver City, Idaho.*

IBM&G (Idaho Bureau of Mines and Geology), December 1926, *Geology and Metalliferous Resources of the Region about Silver City, Idaho.*

IDEQ (Idaho Department of Environmental Quality), December 12, 2011, Public Drinking Water System, Monitoring Schedule Report, Silver City Water System.

_____, March 2005, *Sonnemann Mine & Mill, Site Investigation Report, Owyhee County, Idaho.*

_____, December 2002, *Sonnemann Mine and Mill Preliminary Assessment.*

IDFG (Idaho Department of Fish and Game), January 2012, *2011 – 2012 Fishing Seasons and Rules Including Steelhead.*

_____, Southwest Region, 2010, *Fisheries Management Annual Report.*

IGS (Idaho Geological Survey), 2000, *Site Inspection Report for Abandoned and Inactive Mines in Southern Idaho, Owyhee County.*

LFR, Inc., April 2007, *Ore Consolidation Design and Construction Report for South Mountain Mine, Owyhee County, Idaho.*

Limno-Tech, Inc., November 12, 2001, *Dewey Tunnel and Blue Gulch Phase 1a Site Characterization and Screening Risk Analysis,* prepared for the U.S. Army Corps of Engineers, Walla Walla District and the Idaho Department of Lands, Boise, Idaho.

LPC (The Lewis Publishing Company), 1899, *An Illustrated History of the State of Idaho.*

Mitchell, Victoria E., August 2010, Idaho Geological Survey, *History of the Florida Mountain Mines, Owyhee County, Idaho.*

Nelson, Jerri, December 19, 2011a, Idaho Hotel owner, email communication with Linda Costello, Ecology and Environment, Inc. regarding fishing on Long Gulch and Jordan Creek.

_____, May 18 2011b, Idaho Hotel owner, telephone conversation with Linda Costello, Ecology and Environment, Inc. regarding area conditions.

Orton, Clarence, September 8, 2011, Silver City Water Master, telephone conversation with Linda Costello, Ecology and Environment, Inc. regarding the drinking water supply.

POA (Press of the Owyhee Avalanche), January 1898, *A Historical, Descriptive and Commercial Directory of Owyhee County, Idaho.*

Rueda, Helen, March 2010, United States Environmental Protection Agency, Idaho Operations Office, Jordan Creek Study Area maps (eight maps total) provided for the Jordan Creek Historic Mining Area, Expanded Site Inspection.

Turrill, Charles Beebe, 1876, *California Notes.*

USACE & IDL (United States Army Corps of Engineers and Idaho Department of Lands), November 12, 2001, *Dewey Tunnel and Blue Gulch Phase 1a Site Characterization and Screening Risk Analysis.*

USFWS (United States Fish and Wildlife Service), *Species Profile, Bull Trout (salvelinus confluentus)* webpage http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E065 accessed on May 17, 2011.

USFWS and IFWO (Idaho Fish and Wildlife Office), July 2011, *Threatened, Endangered, Candidate, and Delisted Species.*

This page intentionally left blank.

A Sample Plan Alteration Forms

This page intentionally left blank.

SAMPLE PLAN ALTERATION FORM

Project Name and Number: Jordan Creek Historic Mining Area / 10-01-0006

Material to be Sampled:

Source and sediment samples at the South Mountain Smelter Slag pile.

Measurement Parameters:

Metals in slag and sediment; grain size in sediment.

Standard Procedure for Field Collection and Laboratory Analysis (cite references):

As provided in SQAP.

Reason for Change in Field Procedure or Analytical Variation:

Earlier work indicated that two slag piles were present at the site. In fact, there was one slag pile and one pile of ash. The SQAP called for collecting three slag samples from one pile. These samples were collected. In addition, one sample of the ash pile was collected to characterize this material.

The SQAP also called for sampling one probable point of entry (PPE); however the slag pile had two PPEs: one to Williams Creek and one to a fork of this stream. For this reason, a second PPE sample was collected.

Variation from Field or Analytical Procedure:

Actual field conditions differed from those described in available reference material.

Special Equipment, Materials, or Personnel Required:

None required.

CONTACT	APPROVED SIGNATURE	DATE
Initiator: Linda Costello	Linda E. Costello	9/27/2011
START PL: Linda Costello	Linda E. Costello	9/27/2011
EPA TM: Ken Marcy		9/27/2011
EPA QA Manager : Gina Grepa-Grove	for GGG	09/30/2011

SAMPLE PLAN ALTERATION FORM

Project Name and Number: Jordan Creek Historic Mining Area / 10-01-0006

Material to be Sampled:

Adit water.

Measurement Parameters:

Metals adit water.

Standard Procedure for Field Collection and Laboratory Analysis (cite references):

As provided in SQAP.

Reason for Change in Field Procedure or Analytical Variation:

The SQAP provided for the collection of adit water if found. None of the mine or mill sites visited contained flowing adits. For this reason, a decision was made in consultation with the EPA Task Monitor to sample the drinking water supply in Silver City. Silver City receives its drinking water from a spring. At this time of year, the spring flow is low. The spring caretaker stated the spring is capped and locked. He did not recommended sampling at the springhead since removing the cap would introduce sediment to the water supply due to the low flow conditions. As his home is the closest house to the springhead, his tap water was sampled. In addition, the tap water of a second residence close to the springhead was sampled, as was water at the Idaho Hotel. Neither of the two residences have filters on their water systems; however, the hotel does. There was not portal or faucet upstream of the hotel filters, so a post-filter water sample was collected.

Variation from Field or Analytical Procedure:

Since no flowing adits were encountered, drinking water was sampled.

Special Equipment, Materials, or Personnel Required:

None required.

CONTACT	APPROVED SIGNATURE	DATE
Initiator: Linda Costello	Linda E. Costello	9/27/2011
START PL: Linda Costello	Linda E. Costello	9/27/2011
EPA TM: Ken Marcy		9/27/2011
EPA QA Manager : Gina Grepa-Grove	for GGG	09/30/2011

SAMPLE PLAN ALTERATION FORM

Project Name and Number: Jordan Creek Historic Mining Area / 10-01-0006

Material to be Sampled:

Mines on Long Gulch.

Measurement Parameters:

Metals in waste rock, tailings, and sediment; grain size in sediment.

Standard Procedure for Field Collection and Laboratory Analysis (cite references):

As provided in SQAP.

Reason for Change in Field Procedure or Analytical Variation:

Topographic maps indicated the presence of several mines on Long Gulch upstream of the Potosi Mine. Once in the field it was discovered that the road along Long Gulch requires the use of an ATV. Further, the tributaries of Long Gulch do not have roads and are very difficult to traverse due to their extreme slopes. Local residents, familiar with this gulch and its tributaries stated that no evidence of mines or mills remains in Long Gulch or its tributaries above the Trade Dollar Mine located approximately 1 mile upstream of Silver City. Local residents also stated that three mills were once present on Jordan Creek upstream of Silver City. These were described as including the Cosmos Mill across from the campground in Silver City, and the Shonebar and Poorman Mills approximately ¾ mile upstream of Silver City.

After consulting with the EPA Task Monitor, a decision was made to use the time that would have been spent searching for additional mines upstream of the Trade Dollar Mine on searching for the three mills on Jordan Creek. No evidence of these three mills could be found; however a partially collapsed rock dam was located, as was the campground. The Poorman and Shonebar Mills were described as being close to this dam on its downstream side and across the Jordan Creek from one another. A tributary enters Jordan Creek from the east in this area. One background sediment sample was collected from Jordan Creek upstream of the dam, one sediment sample was collected approximately 10 feet downstream of the tributary near the dam, and one sediment sample was collected near the Silver City campground approximately 10 feet downstream of a tributary entering Jordan Creek at this location.

One resident reported seeing elemental mercury in Jordan Creek beneath the Masonic Lodge. A dirt road crosses Jordan Creek just upstream of this building. One sediment sample was collected on the upstream side of this road to determine mercury concentrations in this area.

Finally, two residents reported that every few years a man comes through Silver City to scavenge for valuables. This man reportedly has on several occasions recovered elemental mercury from the Jordan Creek streambed in adjacent to the Dewey Mine. For this reason, a decision was made in consultation with the TM to sample Jordan Creek in the area of Dewey Mine and to sample two seeps in the stream that emerge from a waste rock pile at this mine. In total, two sediment samples were collected from Jordan Creek near the Dewey Mine mill site, one sediment sample was collected near the seeps, one upstream sediment sample was collected, and water from the two seeps was sampled.

SAMPLE PLAN ALTERATION FORM

Variation from Field or Analytical Procedure:

Actual field conditions differed from those described in available reference material.

Special Equipment, Materials, or Personnel Required:

None required.

CONTACT	APPROVED SIGNATURE	DATE
Initiator: Linda Costello	Linda E. Costello	9/27/2011
START PL: Linda Costello	Linda E. Costello	9/27/2011
EPA TM: Ken Marcy		9/27/201
EPA QA Manager : Gina Grepa-Grove	for GGG	09/30/2011

B Chain-of-Custody Documentation

This page intentionally left blank.

1126708

ntract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41703
DAS No:
SDG No: MJE994

L

Date Shipped:	9/23/2011	Chain Of Custody Record		Sampler Signature:	For Lab Use Only
Carrier Name:	FedEx	Relinquished By	(Date/Time)	Received By	(Date/Time)
Airbill No:	870482639565	1	09/23/11 1600		9/24/11 850
Shipped to:	ALS Laboratory Group - Salt Lake City 960 West LeVoy Drive Salt Lake City UT 84123	2			
		3			
		4			

Lab Contract No: EPW09036
Unit Price: n/a
Transfer To: ALS 9/24/11
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJE994	Waste(High only)/ A. Hamilton	G	Metals/Hg (21)	11384300 (Ice Only) (1)	SP01SS	S: 09/19/2011 14:00		
MJE995	Waste(High only)/ A. Hamilton	G	Metals/Hg (21)	11384301 (Ice Only) (1)	SP02SS	S: 09/19/2011 14:10		
MJE996	Waste(High only)/ A. Hamilton	G	Metals/Hg (21)	11384302 (Ice Only) (1)	SP03SS	S: 09/19/2011 14:20		
MJE9A3	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384309 (Ice Only) (1)	CC01SS	S: 09/20/2011 11:00		
MJE9A4	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384310 (Ice Only) (1)	CC02SS	S: 09/20/2011 11:20		
MJE9A5	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384311 (Ice Only) (1)	CC03SS	S: 09/20/2011 11:27		
MJE9A7	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384313 (Ice Only) (1)	CC03SD	S: 09/20/2011 11:50		

ALS 9/24/11

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N			8	

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium Type/Designate : Composite = C, Grab = G, Both = B

Custody Seal Intact? y Shipment Iced? y

Metals/Hg = CLP TAL Total Metals/Hg (ICP-AES)

COC Number : 10-4097213-092211-0002

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

copy original in Sdh MJE994

1126709

tract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41703
DAS No:
SDG No: MJE932

L

Date Shipped:	9/23/2011	Chain Of Custody Record	Sampler Signature:
Carrier Name:	FedEx	Relinquished By (Date/Time)	Received By (Date/Time)
Airbill No:	870482639565	1 09/23/11	9/24/11
Shipped to:	ALS Laboratory Group - Salt Lake City 960 West LeVoy Drive Salt Lake City UT 84123	2	
		3	
		4	

For Lab Use Only
Lab Contract No: EPW09031C
Unit Price: n/a
Transfer To: ALS 9/24/11
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJE9A8	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384314 (Ice Only) (1)	CC02SD	S: 09/20/2011 12:05		
MJE9A9	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384315 (Ice Only) (1)	CC01SD	S: 09/20/2011 12:20		
MJE9B0	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384316 (Ice Only) (1)	PT03SD	S: 09/20/2011 14:40		
MJE9B1	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384317 (Ice Only) (1)	PT02SD	S: 09/20/2011 14:55		
MJE9B2	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384318 (Ice Only) (1)	PT01SD	S: 09/20/2011 15:15		
MJE9B4	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384320 (Ice Only) (1)	PT01SS	S: 09/20/2011 15:40		
MJE9B5	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384321 (Ice Only) (1)	PT02SS	S: 09/20/2011 15:55		

ALS 9/24/11

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N			8	

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium Type/Designate : Composite = C, Grab = G, Both = B

Custody Seal Intact? Y Shipment Iced? Y

Metals/Hg = CLP TAL Total Metals/Hg (ICP-AES)

60999

COC Number : 10-4097213-092211-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41703
DAS No:
SDG No: MJE9B2

L

Date Shipped:	9/23/2011
Carrier Name:	FedEx
Airbill No:	870482639565
Shipped to:	ALS Laboratory Group - Salt Lake City 960 West LeVoy Drive Salt Lake City UT 84123

Chain Of Custody Record

Sampler Signature:

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1		09/23/11 1100		9/24/11 850
2				
3				
4				

For Lab Use Only

Lab Contract No: EP09036
Unit Price: n/a
Transfer To: 9/24/11
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJE9B6	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384322 (Ice Only) (1)	PT03SS	S: 09/20/2011 14:05		
MJE9B7	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384323 (Ice Only) (1)	TD01SD	S: 09/20/2011 17:45		
MJE9B8	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384324 (Ice Only) (1)	TD02SD	S: 09/20/2011 18:10		
MJE9B9	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384325 (Ice Only) (1)	TD01SS	S: 09/20/2011 18:20		
MJE9C1	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384327 (Ice Only) (1)	TD02SS	S: 09/20/2011 18:40		
MJE9C2	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384328 (Ice Only) (1)	TD03SS	S: 09/20/2011 18:45		
MJE9C4	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384330 (Ice Only) (1)	JC01SD	S: 09/21/2011 10:15		

9/24/11

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :	
N			8		
Analysis Key:	**Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium	**Type/Designate :**	Composite = C, Grab = G, Both = B	Custody Seal Intact? y	Shipment Iced? y

Metals/Hg = CLP TAL Total Metals/Hg (ICP-AES)

9 1000 ..

COC Number : 10-4097213-092211-0002

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41703
DAS No:
SDG No: MJE9B2

L

Date Shipped:	9/23/2011	**Chain Of Custody Record**		Sampler Signature:	
Carrier Name:	FedEx	**Relinquished By**	**(Date/Time)**	**Received By**	**(Date/Time)**
Airbill No:	870482639565	1	09/23/11 10:00		9/24/11 800
Shipped to:	ALS Laboratory Group - Salt Lake City 960 West LeVoy Drive Salt Lake City UT 84123	2			
		3			
		4			

For Lab Use Only
Lab Contract No: EPW 09036
Unit Price: n/a
Transfer To: 9/24/11
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJE9C5	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384331 (Ice Only) (1)	JC02SD	S: 09/21/2011 11:05		
MJE9C8	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384332 (Ice Only) (1)	JC03SD	S: 09/21/2011 11:30		
MJE9C7	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384333 (Ice Only) (1)	JC04SD	S: 09/21/2011 11:55		
MJE9D2	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384336 (Ice Only) (1)	DM01SD	S: 09/22/2011 12:20		
MJE9D3	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384339 (Ice Only) (1)	DM02SD	S: 09/22/2011 12:40		
MJE9D4	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384340 (Ice Only) (1)	DM03SD	S: 09/22/2011 13:05		
MJE9D7	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384343 (Ice Only) (1)	DM04SD	S: 09/22/2011 13:45		

Lab Field Dup

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N			8	

Analysis Key: Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B

Custody Seal Intact? y **Shipment Iced?** y

Metals/Hg = CLP TAL Total Metals/Hg (ICP-AES)

: 00011

COC Number : 10-4097213-092211-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41703
DAS No:
SDG No: MJE994

L

Date Shipped:	9/23/2011	**Chain Of Custody Record**	Sampler Signature:
Carrier Name:	FedEx		
Airbill No:	870482639576	**Relinquished By (Date/Time)**	**Received By (Date/Time)**
Shipped to:	ALS Laboratory Group - Salt Lake City 960 West LeVoy Drive Salt Lake City UT 84123	1 09/23/11 10:00	9/24/11 850
		2	
		3	
		4	

For Lab Use Only
Lab Contract No: EPW09036
Unit Price: n/a
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJE997	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384303 (Ice Only) (1)	BA01SS	S: 09/19/2011 14:30		
MJE998	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384304 (Ice Only) (1)	BK01SS	S: 09/19/2011 14:35		
MJE999	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384305 (Ice Only) (1)	WC04SD	S: 09/19/2011 14:50		
MJE9A0	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384306 (Ice Only) (1)	WC03SD	S: 09/19/2011 15:10		
MJE9A1	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384307 (Ice Only) (1)	WC02SD	S: 09/19/2011 13:25		
MJE9A2	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384308 (Ice Only) (1)	WC01SD	S: 09/19/2011 13:35		
MJE9A8	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384312 (Ice Only) (1)	BK02SS	S: 09/20/2011 11:37		

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :	
N	MJE998		8		
Analysis Key:	**Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium	**Type/Designate :**	Composite = C, Grab = G, Both = B	**Custody Seal Intact?** y	**Shipment Iced?** y

Metals/Hg = CLP TAL Total Metals/Hg (ICP-AES)

COC Number : 10-4097213-092211-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

1126710

copy original in Sdg MJE994

Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41703
DAS No:
SDG No: MJE9C8

L

Date Shipped:	9/23/2011	Chain Of Custody Record		Sampler Signature:	For Lab Use Only
Carrier Name:	FedEx	Relinquished By	(Date/Time)	Received By	(Date/Time)
Airbill No:	870482639576	1	09/23/11 10:00		9/24/11 850
Shipped to:	ALS Laboratory Group - Salt Lake City 960 West LeVoy Drive Salt Lake City UT 84123	2			
		3			
		4			

Lab Contract No: EP09036
Unit Price: n/a
Transfer To: ~~ALS 9/24/11~~
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJE9B3	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384319 (Ice Only) (1)	BK03SS	S: 09/20/2011 15:30		
MJE9C0	Surface Soil/ A. Hamilton	G	Metals/Hg (21)	11384326 (Ice Only) (1)	BK04SS	S: 09/20/2011 16:30		
MJE9C3	Sediment/ A. Hamilton	G	Metals/Hg (21)	11384329 (Ice Only) (1)	TD03SD	S: 09/20/2011 19:05		
MJE9C8	Drinking Water/ A. Hamilton	G	TM/Hg (21)	11384334 (HNO3) (1)	DW01SR	S: 09/22/2011 09:20		
MJE9C9	Drinking Water/ A. Hamilton	G	TM/Hg (21)	11384335 (HNO3) (2)	DW02SR	S: 09/22/2011 09:35		
MJE9D0	Drinking Water/ A. Hamilton	G	TM/Hg (21)	11384338 (HNO3) (1)	DW03SR	S: 09/22/2011 09:55		
MJE9D1	Surface Water/ A. Hamilton	G	TM/Hg (21)	11384337 (HNO3) (1)	BK01SR	S: 09/22/2011 10:50		

~~Alk 9/24/11~~

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :	
N	MJE998, MJE9C3, MJE9C9		8		
Analysis Key:	Concentration : L = Low, M = Medium, H = High, L/M = Low/Medium	Type/Designate :	Composite = C, Grab = G, Both = B	Custody Seal Intact? y	Shipment Iced? y

Metals/Hg = CLP TAL Total Metals/Hg (ICP-AES), TM/Hg = CLP TAL Total Metals and Mercury

90909

COC Number : 10-4097213-092211-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 41703
DAS No:
SDG No: MJE9C8

L

Data Shipped:	9/23/2011
Carrier Name:	FedEx
Airbill No:	870482639576
Shipped to:	ALS Laboratory Group - Salt Lake City 960 West LeVoy Drive Salt Lake City UT 84123

Chain Of Custody Record

	Relinquished By	(Date/Time)	Received By	(Date/Time)
1	[signature]	9/23/11 1020	[signature]	9/24/11 1050
2				
3				
4				

Sampler Signature: [signature]

For Lab Use Only
Lab Contract No: EPW 090 36
Unit Price: n/a
Transfer To: MK 9/24/11
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No	FOR LAB USE ONLY Sample Condition On Receipt
MJE9D5	Ground Water/ A. Hamilton	G	TM/Hg (21)	11384341 (HNO3) (1)	DM01SP	S: 09/22/2011 13:20		MK 9/24/11
MJE9D6	Ground Water/ A. Hamilton	G	TM/Hg (21)	11384342 (HNO3) (1)	DM02SP	9/22/11 13:25 KRM		Collected Sample

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number :
N	MJE998, MJE9C3, MJE9C9		2	

Analysis Key: **Concentration :** L = Low, M = Medium, H = High, L/M = Low/Medium **Type/Designate :** Composite = C, Grab = G, Both = B

Custody Seal Intact? Y Shipment Iced? Y

Metals/Hg = CLP TAL Total Metals/Hg (ICP-AES), TM/Hg = CLP TAL Total Metals and Mercury

COC Number : 10-4097213-092211-0003

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

100007

This page intentionally left blank.

C Data Validation Memoranda

This page intentionally left blank.

Edit History Report

Case No: 41703 Contract: EPW09036 SDG No: MJE9B2 Lab Code: DATAC

Method: ICP_AES

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9B2	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B2	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:14 PM	
MJE9B2	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:47 PM	
MJE9B2	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:47 PM	
MJE9B2	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Niekel	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Vanadium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:26 PM	
MJE9B2	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 4:26 PM	
MJE9B4	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B4	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:21 PM	
MJE9B4	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 3:18 PM	
MJE9B4	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:45 PM	
MJE9B4	Soil	Barium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:45 PM	
MJE9B4	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9B4	Soil	Nickel	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Vanadium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:39 PM	
MJE9B4	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:39 PM	
MJE9B5	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B5	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:09 PM	
MJE9B5	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Barium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Chromium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Cobalt	Validation Flag	J-	JQ	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 3:57 PM	
MJE9B5	Soil	Vanadium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:16 PM	
MJE9B5	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 3:57 PM	
MJE9B6	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B6	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:16 PM	
MJE9B6	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:53 PM	
MJE9B6	Soil	Barium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Chromium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Cobalt	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Copper	Validation Flag	J-		Douald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:53 PM	
MJE9B6	Soil	Maguesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Manganese	Validation	J-		Donald	10/26/11 5:36 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9B6	Soil	Mangauese	Flag	J-		Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Vanadium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:36 PM	
MJE9B6	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:36 PM	
MJE9B7	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B7	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:19 PM	
MJE9B7	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:44 PM	
MJE9B7	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Chromium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Cobalt	Validation Flag		JQ	Donald Matheny	10/31/11 5:22 PM	
MJE9B7	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:44 PM	
MJE9B7	Soil	Magnesium	Validation Flag	JK	JQ	Donald Matheny	10/31/11 5:32 PM	
MJE9B7	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Seleninm	Validation Flag	R	U	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Silver	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Vanadium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:40 PM	
MJE9B7	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:40 PM	
MJE9B8	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B8	Soil	Aluminum	Validation Flag	-		Donald Matheny	10/26/11 3:47 PM	
MJE9B8	Soil	Aluminum	Validation Flag	J-	-	Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:13 PM	
MJE9B8	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Barium	Validation Flag		JK	Donald Matheny	10/26/11 4:20 PM	
MJE9B8	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Calcium	Validation		JK	Donald	10/26/11 4:20 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9B8	Soil	Calcium	Flag		JK	Matheny	10/26/11 4:20 PM	
MJE9B8	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Chromium	Validation Flag		JK	Donald Matheny	10/26/11 4:20 PM	
MJE9B8	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Magnesium	Validation Flag		JK	Donald Matheny	10/26/11 4:20 PM	
MJE9B8	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Nickel	Validation Flag		JK	Donald Matheny	10/26/11 4:20 PM	
MJE9B8	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Silver	Validation Flag	R	U	Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Vanadium	Validation Flag		JK	Donald Matheny	10/26/11 4:20 PM	
MJE9B8	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B8	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 3:46 PM	
MJE9B9	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B9	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:23 PM	
MJE9B9	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 3:28 PM	
MJE9B9	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:32 PM	
MJE9B9	Soil	Barium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:32 PM	
MJE9B9	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Nickel	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Vanadium	Validation	J-	JK	Donald	10/26/11 5:41 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9B9	Soil	Vanadium	Flag	J-	JK	Matheny	10/26/11 5:41 PM	
MJE9B9	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:41 PM	
MJE9C1	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C1	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 4:21 PM	
MJE9C1	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 3:10 PM	
MJE9C1	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Nickel	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 4:18 PM	
MJE9C1	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Vanadium	Validation Flag		JK	Donald Matheny	10/26/11 4:18 PM	
MJE9C1	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C1	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 4:00 PM	
MJE9C2	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C2	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 4:38 PM	
MJE9C2	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 3:15 PM	
MJE9C2	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:48 PM	
MJE9C2	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:48 PM	
MJE9C2	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Manganese	Validation	J-		Donald	10/26/11 5:30 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C2	Soil	Manganese	Flag	J-		Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Nickel	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Selenium	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Vanadium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:30 PM	
MJE9C2	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:30 PM	
MJE9C3	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C3	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:23 PM	
MJE9C3	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 3:29 PM	
MJE9C3	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:32 PM	
MJE9C3	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:32 PM	
MJE9C3	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Nickel	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Thallium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Vanadium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:42 PM	
MJE9C3	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:42 PM	
MJE9C3D	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C3D	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Antimony	Validation Flag	JL		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 3:20 PM	
MJE9C3D	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Chromium	Validation	J-		Donald	10/26/11 3:33 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C3D	Soil	Chromium	Flag	J-		Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Niekel	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Selenium	Validation Flag	R		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Sodium	Validation Flag	U		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Thallium	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Vanadimn	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3D	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 3:33 PM	
MJE9C3S	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C3S	Soil	Antimony	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Mangancse	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Selenium	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Thallium	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C3S	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 3:12 PM	
MJE9C4	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C4	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 3:54 PM	
MJE9C4	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:08 PM	
MJE9C4	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:54 PM	
MJE9C4	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 3:54 PM	
MJE9C4	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Chromium	Validation	UJ	UJK	Donald	10/26/11 4:04 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C4	Soil	Chromium	Flag	UJ	UJK	Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Cobalt	Validation Flag	UJ	U	Donald Matheny	10/31/11 4:05 PM	
MJE9C4	Soil	Copper	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:54 PM	
MJE9C4	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:13 PM	
MJE9C4	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Silver	Validation Flag	R	U	Donald Matheny	10/26/11 4:04 PM	
MJE9C4	Soil	Vanadium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:15 PM	
MJE9C4	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 4:04 PM	
MJE9C5	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C5	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:15 PM	
MJE9C5	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:53 PM	
MJE9C5	Soil	Barium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Calcium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Cobalt	Validation Flag	UJ	U	Donald Matheny	10/31/11 4:46 PM	
MJE9C5	Soil	Copper	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Lead	Validation Flag	JH	JQ	Donald Matheny	10/31/11 4:53 PM	
MJE9C5	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:53 PM	
MJE9C5	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:34 PM	
MJE9C5	Soil	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Silver	Validation Flag	R	U	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Vanadium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:33 PM	
MJE9C5	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:33 PM	
MJE9C6	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C6	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:10 PM	
MJE9C6	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Beryllium	Validation	J-	JQ	Donald	10/26/11 3:59 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C6	Soil	Beryllium	Flag	J-	JQ	Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Chromium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Cobalt	Validation Flag	UJ	U	Donald Matheny	10/31/11 4:20 PM	
MJE9C6	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Magnesium	Validation Flag	JK	JQ	Donald Matheny	10/31/11 4:20 PM	
MJE9C6	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Silver	Validation Flag	R	U	Donald Matheny	10/26/11 3:59 PM	
MJE9C6	Soil	Vanadium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:17 PM	
MJE9C6	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 3:59 PM	
MJE9C7	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C7	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 3:55 PM	
MJE9C7	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:09 PM	
MJE9C7	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:55 PM	
MJE9C7	Soil	Barium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 3:55 PM	
MJE9C7	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Calcium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Chromium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Cobalt	Validation Flag	UJ	U	Donald Matheny	10/31/11 4:05 PM	
MJE9C7	Soil	Copper	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:55 PM	
MJE9C7	Soil	Magnesium	Validation Flag	JK	JQ	Donald Matheny	10/31/11 4:05 PM	
MJE9C7	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:14 PM	
MJE9C7	Soil	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Silver	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:05 PM	
MJE9C7	Soil	Vanadium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:15 PM	
MJE9C7	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 4:05 PM	
MJE9D2	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9D2	Soil	Aluminum	Validation	J-		Donald	10/26/11 5:26 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9D2	Soil	Aluminum	Flag	J-		Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 3:14 PM	
MJE9D2	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:47 PM	
MJE9D2	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Cobalt	Validation Flag	UJ	U	Donald Matheny	10/31/11 4:23 PM	
MJE9D2	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:47 PM	
MJE9D2	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Vanadium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:26 PM	
MJE9D2	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:26 PM	
MJE9D3	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9D3	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 4:22 PM	
MJE9D3	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 3:11 PM	
MJE9D3	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Magnesium	Validation Flag	JK	JQ	Donald Matheny	10/31/11 4:22 PM	
MJE9D3	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Silver	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Vanadium	Validation		JK	Donald	10/26/11 4:19 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9D3	Soil	Vanadium	Flag		JK	Matheny	10/26/11 4:19 PM	
MJE9D3	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D3	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 4:02 PM	
MJE9D4	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9D4	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 3:54 PM	
MJE9D4	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 2:54 PM	
MJE9D4	Soil	Arsenic	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:54 PM	
MJE9D4	Soil	Barium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Calcium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Cobalt	Validation Flag	UJ	U	Donald Matheny	10/31/11 4:04 PM	
MJE9D4	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 3:54 PM	
MJE9D4	Soil	Magnesium	Validation Flag	JK	JQ	Donald Matheny	10/31/11 4:04 PM	
MJE9D4	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Silver	Validation Flag	J-	JQ	Donald Matheny	10/26/11 4:03 PM	
MJE9D4	Soil	Vanadium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 4:16 PM	
MJE9D4	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 4:03 PM	
MJE9D7	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9D7	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Antimony	Validation Flag	R	UJL	Donald Matheny	10/26/11 2:55 PM	
MJE9D7	Soil	Arsenic	Validation Flag	JL	JH	Donald Matheny	10/26/11 2:55 PM	
MJE9D7	Soil	Arsenic	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:53 PM	
MJE9D7	Soil	Barium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Calcium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Chromium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Cobalt	Validation Flag	UJ	U	Donald Matheny	10/31/11 4:03 PM	
MJE9D7	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Lead	Validation Flag	J-	JH	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Magnesium	Validation Flag	J-	JK	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Manganese	Validation	J-		Donald	10/26/11 5:09 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9D7	Soil	Manganese	Flag	J-		Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Nickel	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Silver	Validation Flag	J-	JQ	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Vanadium	Validation Flag	UJ	UJK	Donald Matheny	10/26/11 5:09 PM	
MJE9D7	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 5:09 PM	

Method: HG

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9B2	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B2	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:33 PM	
MJE9B4	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B4	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:52 PM	
MJE9B5	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B5	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:33 PM	
MJE9B6	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B6	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:41 PM	
MJE9B7	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B7	Soil	Mercury	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:25 PM	
MJE9B7	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:41 PM	
MJE9B8	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B8	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:42 PM	
MJE9B9	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9B9	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:30 PM	
MJE9C1	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C1	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:42 PM	
MJE9C2	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C2	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:37 PM	
MJE9C3	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C3	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:34 PM	
MJE9C3D	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C3D	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:38 PM	
MJE9C3S	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C3S	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:52 PM	
MJE9C4	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C4	Soil	Mercury	Validation Flag	R	UJL	Donald Matheny	10/26/11 2:37 PM	
MJE9C5	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C5	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:33 PM	
MJE9C6	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C6	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:37 PM	
MJE9C7	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9C7	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:37 PM	
MJE9D2	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9D2	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:30 PM	
MJE9D3	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9D3	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:30 PM	
MJE9D4	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9D4	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:33 PM	
MJE9D7	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 5:47 PM	Y
MJE9D7	Soil	Mercury	Validation Flag	J-	JL	Donald Matheny	10/26/11 2:31 PM	

Edit History Report

Case No: 41703 Contract: EPW09036 SDG No: MJE9C8 Lab Code: DATAC

Method: HG

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C8	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9C8	Water	Mercury	Validation Flag	R	U	Donald Matheny	10/25/11 2:33 PM	
MJE9C9	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9C9	Water	Mercury	Validation Flag	R	U	Donald Matheny	10/25/11 2:31 PM	
MJE9C9D	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9C9D	Water	Mercury	Validation Flag	R	U	Donald Matheny	10/25/11 2:32 PM	
MJE9C9S	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9C9S	Water	Mercury	Validation Flag	J-		Donald Matheny	10/25/11 2:32 PM	
MJE9D0	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9D0	Water	Mercury	Validation Flag	R	U	Donald Matheny	10/25/11 2:31 PM	
MJE9D1	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9D1	Water	Mercury	Validation Flag	R	U	Donald Matheny	10/25/11 2:32 PM	
MJE9D5	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9D5	Water	Mercury	Validation Flag	R	U	Donald Matheny	10/25/11 2:32 PM	
MJE9D6	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9D6	Water	Mercury	Validation Flag	R	U	Donald Matheny	10/25/11 2:32 PM	

Method: ICP_AES

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C8	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9C8	Water	Aluminum	Validation Flag	J-	JQ	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Antimony	Validation Flag	R	U	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Arsenic	Validation Flag	R	U	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Beryllium	Validation Flag	R	U	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Cadmium	Validation Flag	R	U	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Cobalt	Validation Flag	R	U	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Copper	Validation Flag	UJ	UJL	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Lead	Validation Flag	J-	JQ	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Magnesium	Validation Flag	J-	JQ	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Nickel	Validation Flag	R	U	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Selenium	Validation Flag	R	U	Donald Matheny	10/25/11 2:50 PM	
MJE9C8	Water	Silver	Validation Flag	R	U	Donald Matheny	10/25/11 2:50 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C9	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9C9	Water	Aluminum	Validation Flag	J-		Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Antimony	Validation Flag	R	U	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Arsenic	Validation Flag	R	U	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Beryllium	Validation Flag	R	U	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Cadmium	Validation Flag	R	U	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Chromium	Validation Flag	R	U	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Cobalt	Validation Flag	R	U	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Copper	Validation Flag	J-	JL	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Lead	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9C9	Water	Lead	Validation Flag	J-	J	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Magnesium	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9C9	Water	Magnesium	Validation Flag	J-	J	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Nickel	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9C9	Water	Niekel	Validation Flag	J-	J	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Potassium	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9C9	Water	Potassium	Validation Flag	J-	J	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Selenium	Validation Flag	R	U	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Silver	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9C9	Water	Silver	Validation Flag	J-	J	Donald Matheny	10/25/11 2:49 PM	
MJE9C9	Water	Vanadium	Validation Flag	R	U	Donald Matheny	10/25/11 2:47 PM	
MJE9C9D	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9C9D	Water	Aluminum	Validation Flag	J-		Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Antimony	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Arsenic	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Beryllium	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Cadmium	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Chromium	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Cobalt	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Copper	Validation Flag	J-		Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Iron	Validation Flag	J-		Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Lead	Validation Flag	J-	J	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Magnesium	Validation Flag	J-	J	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Nickel	Validation Flag	J-	J	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Potassium	Validation Flag	J-	J	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Selenium	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Silver	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Vanadium	Validation Flag	R	U	Donald Matheny	10/25/11 2:56 PM	
MJE9C9D	Water	Zinc	Validation Flag	J-		Donald Matheny	10/25/11 2:56 PM	
MJE9C9S	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9C9S	Water	Aluminum	Validation	J-		Donald	10/25/11 2:34 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9C9S	Water	Aluminum	Flag	J-		Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Antimony	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Arsenic	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Barium	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Beryllium	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Cadmium	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Chromium	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Cobalt	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Copper	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Iron	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Lead	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Manganese	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Nickel	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Selenium	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Silver	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Thallium	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Vanadium	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9C9S	Water	Zinc	Validation Flag	J-		Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9D0	Water	Aluminum	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9D0	Water	Aluminum	Validation Flag	J-	J	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Antimony	Validation Flag	R	U	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Arsenic	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9D0	Water	Arsenic	Validation Flag	J-	J	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Beryllium	Validation Flag	R	U	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Cadmium	Validation Flag	R	U	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Chromium	Validation Flag	R	U	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Cobalt	Validation Flag	R	U	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Copper	Validation Flag	J-	JL	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Lead	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9D0	Water	Lead	Validation Flag	J-	J	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Magnesium	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9D0	Water	Magnesium	Validation Flag	J-	J	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Nickel	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9D0	Water	Nickel	Validation Flag	J-	J	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Potassium	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9D0	Water	Potassium	Validation Flag	J-	J	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Selenium	Validation Flag	R	U	Donald Matheny	10/25/11 2:34 PM	
MJE9D0	Water	Silver	Validation Flag	J	JQ	Donald Matheny	10/25/11 2:51 PM	
MJE9D0	Water	Silver	Validation Flag	J-	J	Donald Matheny	10/25/11 2:34 PM	
MJE9D1	Water		Validation		S4VEM	Donald	10/25/11 3:00 PM	Y

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9D1	Water		Level		S4VEM	Matheny	10/25/11 3:00 PM	Y
MJE9D1	Water	Aluminum	Validation Flag	J-		Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Antimony	Validation Flag	R	U	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Arsenic	Validation Flag	J-	JQ	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Beryllium	Validation Flag	R	U	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Cadmium	Validation Flag	R	U	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Cobalt	Validation Flag	R	U	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Copper	Validation Flag	UJ	UJL	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Iron	Validation Flag	J-		Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Lead	Validation Flag	R	U	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Magnesium	Validation Flag	J-	JQ	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Nickel	Validation Flag	R	U	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Selenium	Validation Flag	R	U	Donald Matheny	10/25/11 2:54 PM	
MJE9D1	Water	Silver	Validation Flag	R	U	Donald Matheny	10/25/11 2:54 PM	
MJE9D5	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9D5	Water	Aluminum	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Antimony	Validation Flag	R	U	Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Arsenic	Validation Flag	R	U	Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Beryllium	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Cadmium	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Calcium	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Cobalt	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Copper	Validation Flag	J-	JL	Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Lead	Validation Flag	R	U	Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Magnesium	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Manganese	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Nickel	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Potassium	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Selenium	Validation Flag	R	U	Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Silver	Validation Flag	J-	JQ	Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Sodium	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D5	Water	Zinc	Validation Flag	J-		Donald Matheny	10/25/11 2:53 PM	
MJE9D6	Water		Validation Level		S4VEM	Donald Matheny	10/25/11 3:00 PM	Y
MJE9D6	Water	Aluminum	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Antimony	Validation Flag	R	U	Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Arsenic	Validation Flag	R	U	Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Beryllium	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Cadmium	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Calcium	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Chromium	Validation	R	U	Donald	10/25/11 2:55 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9D6	Water	Chromium	Flag	R	U	Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Cobalt	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Copper	Validation Flag	J-	JL	Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Lead	Validation Flag	R	U	Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Magnesium	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Manganese	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Nickel	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Potassium	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Selenium	Validation Flag	R	U	Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Silver	Validation Flag	R	U	Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Sodium	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Vanadium	Validation Flag	R	U	Donald Matheny	10/25/11 2:55 PM	
MJE9D6	Water	Zinc	Validation Flag	J-		Donald Matheny	10/25/11 2:55 PM	

Edit History Report

Case No: 41703 Contract: EPW09036 SDG No: MJE994 Lab Code: DATAC

Method: ICP_AES

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE994	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE994	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Beryllium	Validation Flag	R	U	Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Cadmium	Validation Flag	J-	JQ	Douald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Niekel	Validation Flag	J-	JQ	Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE994	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE995	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE995	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Barium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Beryllium	Validation Flag	R	U	Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Cadmium	Validation Flag	R	U	Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Irou	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Magnesium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE995	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 6:56 PM	
MJE996	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE996	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:42 PM	
MJE996	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Beryllium	Validation Flag	R	U	Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Cadmium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Nickel	Validation Flag	R	U	Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Potassium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE996	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:11 PM	
MJE997	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE997	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Antimony	Validation Flag	JQ	JL	Donald Matheny	10/31/11 5:44 PM	
MJE997	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:43 PM	
MJE997	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE997	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 6:57 PM	
MJE998	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE998	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:45 PM	
MJE998	Soil	Antimony	Validatiou	J-	JL	Donald	10/26/11 7:03 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE998	Soil	Antimony	Flag	J-	JL	Matheny	10/26/11 7:03 PM	
MJE998	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:03 PM	
MJE998D	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE998D	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998D	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE998S	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE998S	Soil	Antimony	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Arsenic	Validation	J-		Donald	10/26/11 7:10 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE998S	Soil	Arsenic	Flag	J-		Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Selenium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Thallium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE998S	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:10 PM	
MJE999	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE999	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:45 PM	
MJE999	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE999	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A0	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:46 PM	
MJE9A0	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Arsenic	Validation	J-		Donald	10/26/11 7:05 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9A0	Soil	Arsenic	Flag	J-		Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A0	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:05 PM	
MJE9A1	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A1	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Antimony	Validation Flag	JL	JQ	Donald Matheny	10/31/11 5:46 PM	
MJE9A1	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Beryllium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A1	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:06 PM	
MJE9A2	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A2	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Antimony	Validation	JL	JQ	Donald	10/31/11 5:47 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9A2	Soil	Antimony	Flag	JL	JQ	Matheny	10/31/11 5:47 PM	
MJE9A2	Soil	Antimony	Validation Flag	J-	JL	Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A2	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:04 PM	
MJE9A3	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A3	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Barium	Validation Flag	J-	JQ	Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A3	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:00 PM	
MJE9A4	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A4	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Arsenic	Validation	J-		Donald	10/26/11 6:59 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9A4	Soil	Arsenic	Flag	J-		Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A4	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 6:59 PM	
MJE9A5	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A5	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A5	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9A6	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A6	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Barium	Validation	J-		Donald	10/26/11 7:07 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9A6	Soil	Barium	Flag	J-		Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Cobalt	Validation Flag	J-		Douald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A6	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9A7	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A7	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A7	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:08 PM	
MJE9A8	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A8	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Barium	Validation	J-		Donald	10/26/11 7:01 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9A8	Soil	Barium	Flag	J-		Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A8	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:01 PM	
MJE9A9	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A9	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Silver	Validation Flag	R	U	Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9A9	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:12 PM	
MJE9B0	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9B0	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Calcium	Validation	J-		Donald	10/26/11 7:07 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9B0	Soil	Calcium	Flag	J-		Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Selenium	Validation Flag	R	U	Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B0	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:07 PM	
MJE9B1	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9B1	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B1	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:13 PM	
MJE9B3	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9B3	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Calcium	Validation	J-		Donald	10/26/11 6:58 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE9B3	Soil	Calcium	Flag	J-		Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Silver	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9B3	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 6:58 PM	
MJE9C0	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9C0	Soil	Aluminum	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Antimony	Validation Flag	UJ	UJL	Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Arsenic	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Barium	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Beryllium	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Cadmium	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Calcium	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Chromium	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Cobalt	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Copper	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Iron	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Lead	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Magnesium	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Manganese	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Nickel	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Potassium	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Vanadium	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	
MJE9C0	Soil	Zinc	Validation Flag	J-		Donald Matheny	10/26/11 7:09 PM	

Method: HG

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJE994	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE995	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE996	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE997	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE998	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE998D	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE998S	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE998S	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:40 PM	
MJE999	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A0	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A1	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A2	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A3	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A3	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:40 PM	
MJE9A4	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A4	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:43 PM	
MJE9A5	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A5	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:41 PM	
MJE9A6	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A6	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:43 PM	
MJE9A7	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A7	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:44 PM	
MJE9A8	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9A8	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:42 PM	
MJE9A9	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9B0	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9B0	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:40 PM	
MJE9B1	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9B1	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:43 PM	
MJE9B3	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y
MJE9B3	Soil	Mercury	Validation Flag	J-		Donald Matheny	10/26/11 6:43 PM	
MJE9C0	Soil		Validation Level		S4VEM	Donald Matheny	10/26/11 7:14 PM	Y

International Specialists in the Environment
720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: October 27, 2011

TO: Linda Costello, START-3 Project Manager, E & E, Seattle, WA

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, WA MW

SUBJ: **Data Quality Assurance Review, Jordan Creek Historic Mining Area, Owyhee County, Idaho**

REF: TDD: 10-01-0006 PAN: 002233.0541.01SR

The data quality assurance review of 21 sediment samples collected from the Jordan Creek Historic Mining Area site in Owyhee County, Idaho, has been completed. Grain size (ASTM method D422) analyses were performed by Analytical Resources, Inc., Tukwila, Washington. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered:

JC04SD	PT01SD	PT02SD	PT03SD	TD01SD
TD02SD	CC01SD	CC02SD	CC03SD	JC01SD
JC02SD	JC03SD	TD03SD	WC04SD	DM01SD
DM02SD	DM03SD	DM04SD	WC01SD	WC02SD
WC03SD				

Data Qualifications:

The samples were collected between September 19 and 22, 2011, and were analyzed by October 18, 2011. Due to the sandy nature of the samples, there was not enough fine material to acquire accurate hydrometer readings. Thirteen samples required curve fitting between the sand and silt fractions. These samples weren't noted, so no action was taken based on these discrepancies. No other discrepancies were noted in the laboratory case narrative.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004) and the analytical method. Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Ecology & Environment
CASE 41703

Percent Finer (Passing) Than the Indicated Size

Sieve Size (microns)	3"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4 (4750)	#10 (2000)	#20 (850)	#40 (425)	#60 (250)	#100 (150)	#200 (75)	32	22	13	9	7	3 2	1 3
PT02SD	100 0	100 0	100.0	100.0	100.0	97.9	98 9	91.9	89.7	82.9	58.0	32.1	22 0	17.1	13 0	11.1	9.2	7.6	7 3	3 8	1.9
	100.0	100 0	100 0	100 0	100.0	100.0	97.9	91.3	88.3	81.0	56.6	31 3	21.2	16 2	12.8	10 9	8.3	7.5	6.8	3 8	1.9
	100.0	100.0	100.0	100.0	100.0	100 0	96.8	92.6	88 9	81 4	55 7	29.9	20 1	15.4	12.9	10 6	9 1	8 3	6.6	3.8	1 9
CC01SD	100.0	100.0	100.0	100 0	100.0	100.0	93.9	74.8	57.2	44 9	36.7	32 0	28 2	24.0	17.9	13.9	11.2	9.7	8 2	4 5	2 4
CC02SD	100.0	100.0	100 0	100.0	100.0	100.0	98 8	89.0	68.5	46 2	29.3	19.9	15.3	12.2	10.8	10.0	8 9	7.6	6 0	4 6	3 2
CC03SD	100.0	100.0	100 0	100 0	100.0	100 0	97.7	81.3	63 0	48.5	40 6	33.8	27.7	22.7	19.7	17.1	15.1	12.6	11 6	7.6	4 8
JC01SD	100.0	100 0	100.0	100.0	100.0	100 0	100.0	97.9	76.4	34.6	16.9	7.3	3 4	2 2	2.1	1.5	1.3	1 3	1.0	0 8	0.5
JC02SD	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96 3	59.7	27.1	10.1	3.4	1.7	1.2	1.0	0 8	0.8	0 6	0 4	0 4	0.0
JC03SD	100 0	100.0	100.0	100.0	100.0	100.0	99.0	92 9	76.6	37.7	12.1	3.5	1.6	1.1	1.0	0 8	0 8	0.8	0.5	0.5	0 0
JC04SD	100.0	100.0	100.0	100 0	100.0	99.0	98 4	81.5	47.5	22.9	8.5	2.7	1.1	0.7	0 6	0.6	0 6	0.6	0.6	0 4	0 0
PT01SD	100.0	100.0	100.0	100.0	100.0	98.4	94 5	84.9	57.0	24.8	11.2	7.3	5.7	4.6	4.4	3 8	3.3	3.0	1 6	1 6	0.3
PT03SD	100.0	100.0	100.0	100 0	100.0	97.5	92.0	71.4	45.3	22 5	8.8	3 7	2.4	1.9	1.8	1 3	1 3	1.1	0 7	0.4	0 2
TD01SD	100 0	100.0	100 0	100.0	100 0	99.3	94 7	69.6	35 3	13.9	5.8	3.1	2.2	1.8	1 6	1.2	0 8	0.8	0 6	0 3	0 2
TD02SD	100.0	100 0	100.0	100.0	100.0	98 2	95.8	75.4	44.5	22 8	10.8	5.7	3 6	2 6	2 4	2 0	1.3	1 2	1 0	0 7	0.3
TD03SD	100.0	100 0	100.0	100.0	100 0	98 7	93 5	74 5	44.7	17.1	5 9	2.7	1.7	1.3	1 3	0 9	0.9	0 8	0 6	0.3	0.2
WC04SD	100.0	100.0	100.0	100 0	100.0	100.0	94 6	76.5	58.4	41.7	29 3	20.3	13 7	8.6	5.8	4.6	3 7	3 3	1 9	1.2	0.2

Testing performed according to ASTM D421/D422

TN91

Ecology & Environment
CASE 41703

Percent Retained in Each Size Fraction

Description	%Coarse Gravel				% Gravel			% Coarse Sand	% Medium Sand		% Fine Sand			% Very Coarse Silt	% Coarse Silt	% Medium Silt	% Fine Silt	% Fine Silt	% Very Fine Silt	% Clay
Particle Size (microns)	3-2"	2-1 1/2"	1 1/2"-1"	1-3/4"	3/4-1/2"	1/2-3/8"	3/8"-4750	4750-2000	2000-850	850-425	425-250	250-150	150-75	75-32	32-22	22-13	13-9	9-7	7-3 2	<3 2
PT02SD	0.0	0.0	0.0	0.0	2.1	1.1	4.9	2.2	6 8	24.9	25.9	10.1	4.9	4.1	1.9	1.9	1 5	0 4	3 4	3 8
	0.0	0.0	0.0	0 0	0.0	2 1	8.8	3 0	7 3	24 4	25 3	10 2	5 0	3 4	1.9	2 6	0 8	0.6	3 0	3 8
	0.0	0.0	0.0	0.0	0.0	3.2	4.1	3.8	7.5	25.6	25 8	9.8	4.7	2.5	2.3	1.5	0 8	1 5	3.0	3.8
CC01SD	0.0	0.0	0 0	0.0	0.0	6.1	19.1	17.6	12.3	8.2	4.7	3.8	4.2	6.2	3.9	2.7	1.5	1.5	3 6	4 5
CC02SD	0.0	0.0	0 0	0 0	0.0	1.2	9.8	20.5	22 3	17.0	9.3	4.6	3.1	1.4	0.8	1.1	1 4	1 6	1 4	4 6
CC03SD	0.0	0.0	0.0	0.0	0.0	2 3	16.3	18.4	14.5	7.9	8.8	6.1	5 0	3.0	2.5	2 0	2.5	1.0	4 0	7 6
JC01SD	0.0	0.0	0.0	0.0	0.0	0 0	2 1	21.4	41.8	17.9	9.6	3.9	1.1	0.1	0 5	0.3	0 0	0.3	0.3	0 8
JC02SD	0.0	0 0	0.0	0.0	0 0	0.0	3.7	36.6	32 5	17.0	6.7	1.7	0.5	0.2	0.2	0.0	0.2	0.2	0 0	0 4
JC03SD	0.0	0 0	0 0	0.0	0.0	1.0	6.1	16.3	38.9	25.5	8.8	1.9	0 5	0 1	0.3	0.0	0 0	0 3	0.0	0.5
JC04SD	0.0	0.0	0.0	0.0	1.0	2.6	14.9	34 0	24.6	14.3	5.9	1.5	0 4	0.1	0.0	0.0	0.0	0 0	0.2	0 4
PT01SD	0.0	0 0	0.0	0.0	1.6	4 0	9 8	27.9	32 2	13.6	4 0	1 5	1.2	0.2	0.5	0.5	0.3	1.4	0 0	1.6
PT03SD	0.0	0 0	0.0	0.0	2.5	5.5	20.7	26.0	22.8	13.9	4.9	1.3	0.5	0.1	0 5	0.0	0.2	0.4	0.4	0.4
TD01SD	0.0	0.0	0.0	0 0	0.7	4.6	25.1	34.3	21.4	8.1	2.7	0 9	0.4	0.2	0.3	0 5	0 0	0 2	0 3	0 3
TD02SD	0.0	0 0	0.0	0.0	1.8	2.4	20 5	30.9	21.7	12.0	5.0	2.1	1.1	0.2	0.3	0.7	0 2	0.2	0 3	0 7
TD03SD	0.0	0.0	0.0	0.0	1 3	5.2	19.0	29 8	27 6	11.2	3.2	1.0	0.4	0.1	0.3	0 0	0 2	0 2	0 3	0 3
WC04SD	0.0	0.0	0.0	0 0	0.0	5.4	18.1	18.1	16 7	12 4	9 0	6.6	5.2	2.8	1.2	0 8	0 4	1.5	0.6	1 2

MW 18-24-11

TN91

Client	Ecology & Environment	Project No	CASE 41703
ARI Triplicate Sample ID	TN91I	Batch No	TN91-01
Client Triplicate Sample ID:	PT02SD	Page	1 of 1

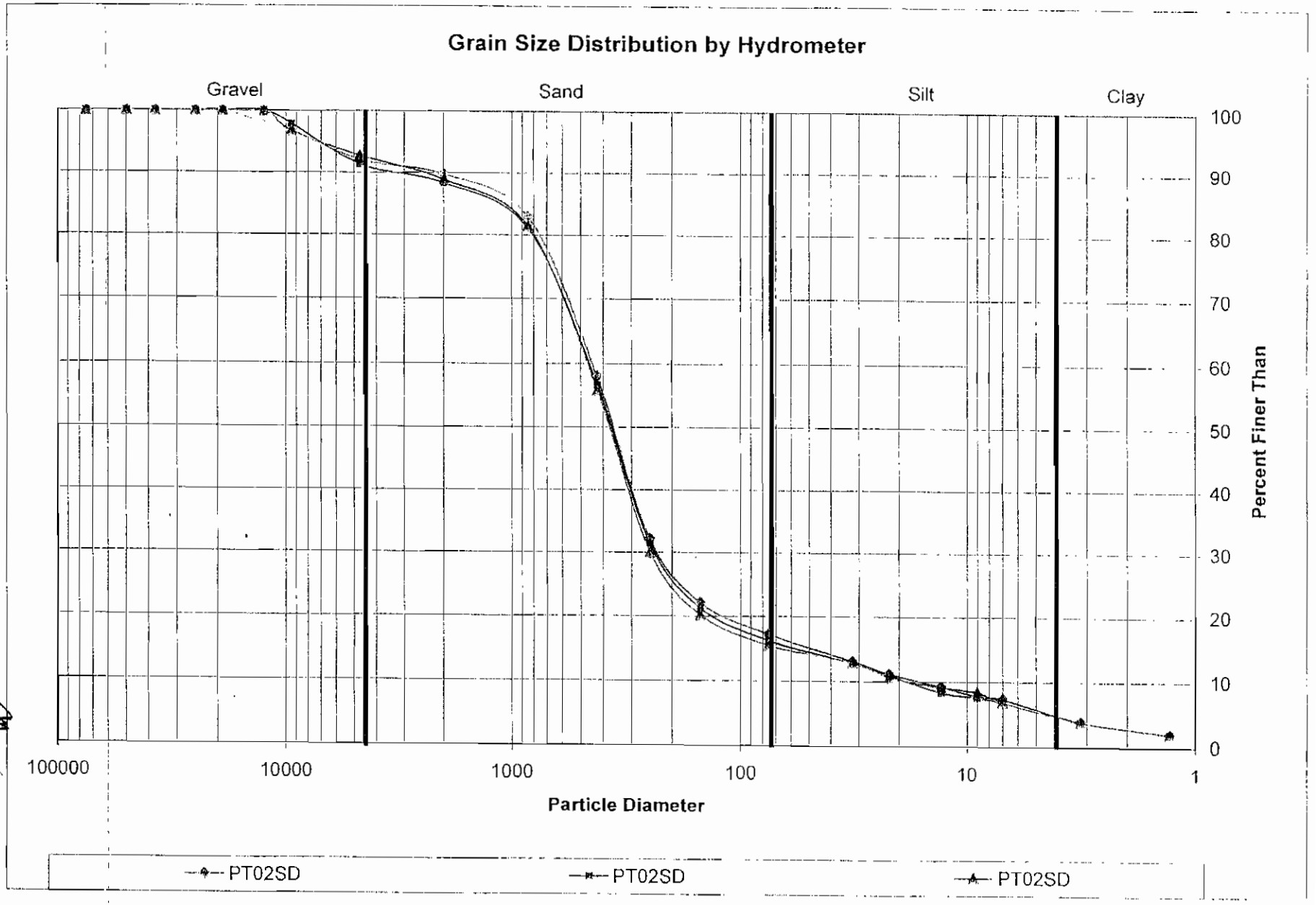
Relative Standard Deviation, By Size

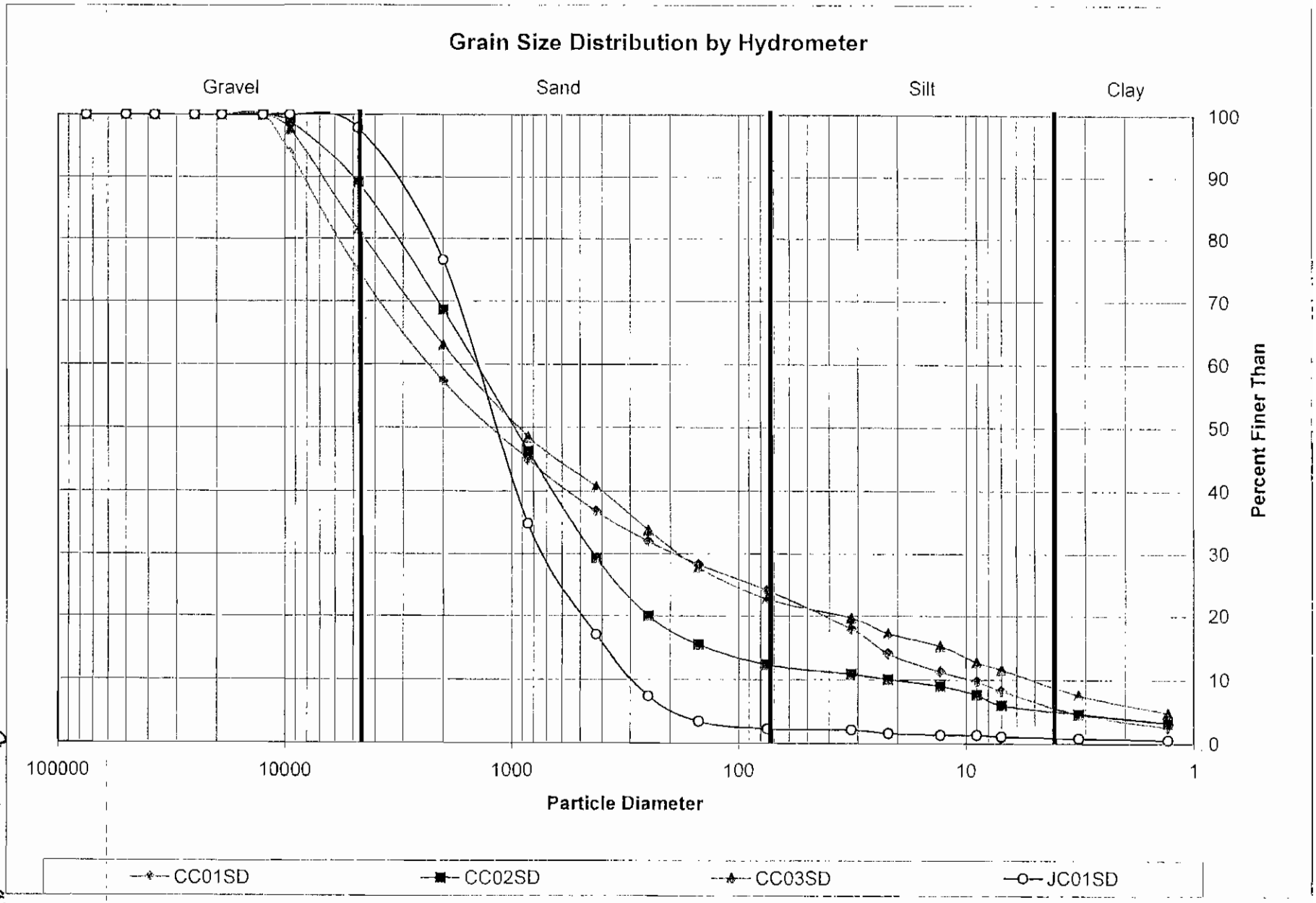
Sample ID	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	32	22	13	9	7	3.2	1.3
PT02SD	100.0	100.0	100.0	100.0	100.0	97.9	96.9	91.9	89.7	82.9	58.0	32.1	22.0	17.1	13.0	11.1	9.2	7.6	7.3	3.8	1.9
PT02SD	100.0	100.0	100.0	100.0	100.0	100.0	97.9	91.3	88.3	81.0	56.6	31.3	21.2	16.2	12.8	10.9	8.3	7.5	6.8	3.8	1.9
PT02SD	100.0	100.0	100.0	100.0	100.0	100.0	96.8	92.6	88.9	81.4	55.7	29.9	20.1	15.4	12.9	10.6	9.1	8.3	8.8	3.8	1.9
AVE	100.00	100.00	100.00	100.00	100.00	99.32	97.17	91.93	88.94	81.76	56.77	31.12	21.10	16.23	12.88	10.88	8.84	7.83	6.95	3.79	1.89
STDEV	0.00	0.00	0.00	0.00	0.00	1.19	0.64	0.68	0.71	0.99	1.14	1.10	0.95	0.84	0.11	0.24	0.50	0.44	0.28	0.03	0.02
%RSD	0.00	0.00	0.00	0.00	0.00	1.19	0.65	0.74	0.80	1.21	2.01	3.53	4.53	5.20	0.89	2.24	5.70	5.62	3.97	0.89	0.89

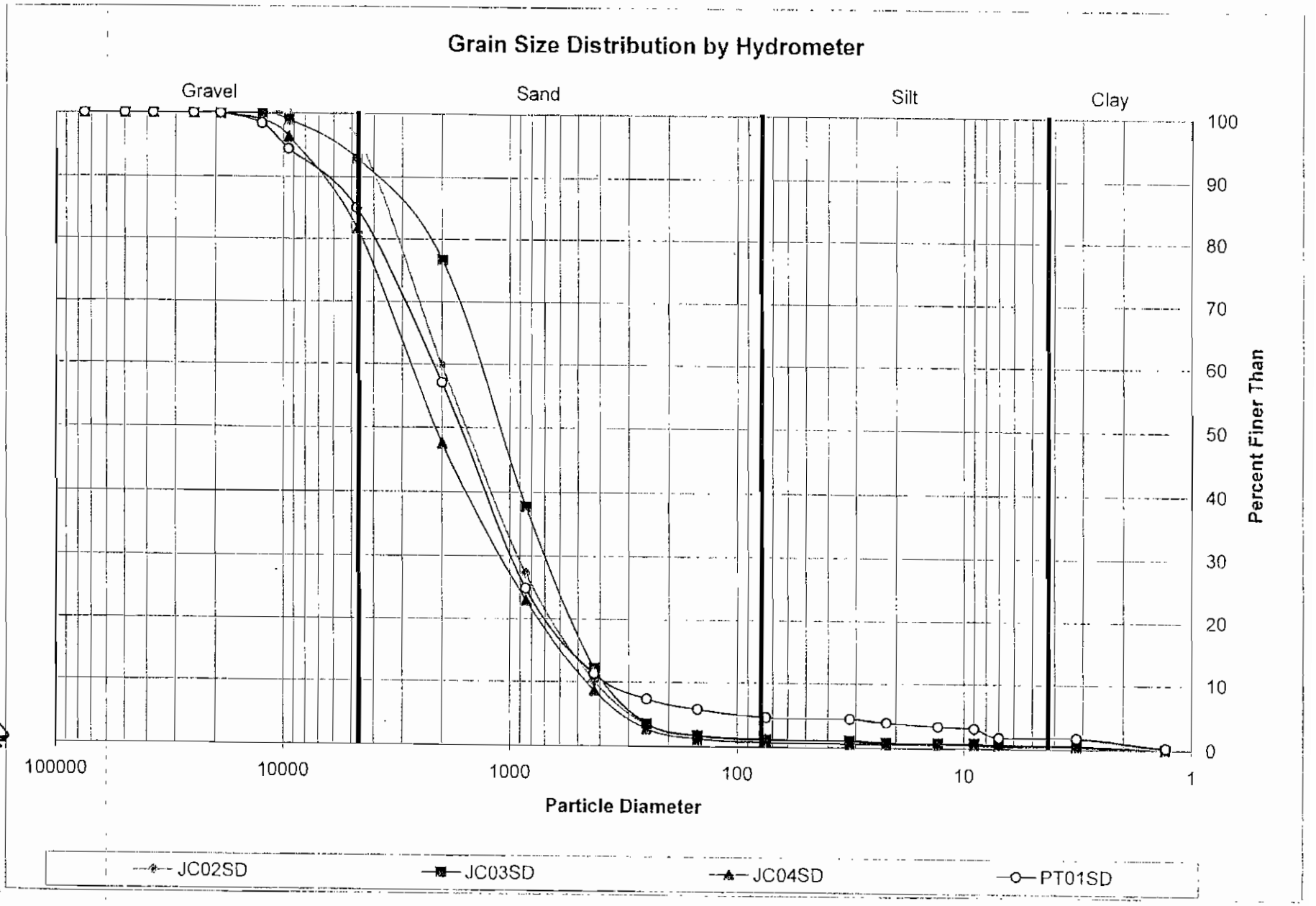
This Triplicate applies to the Batch Containing the Following Samples

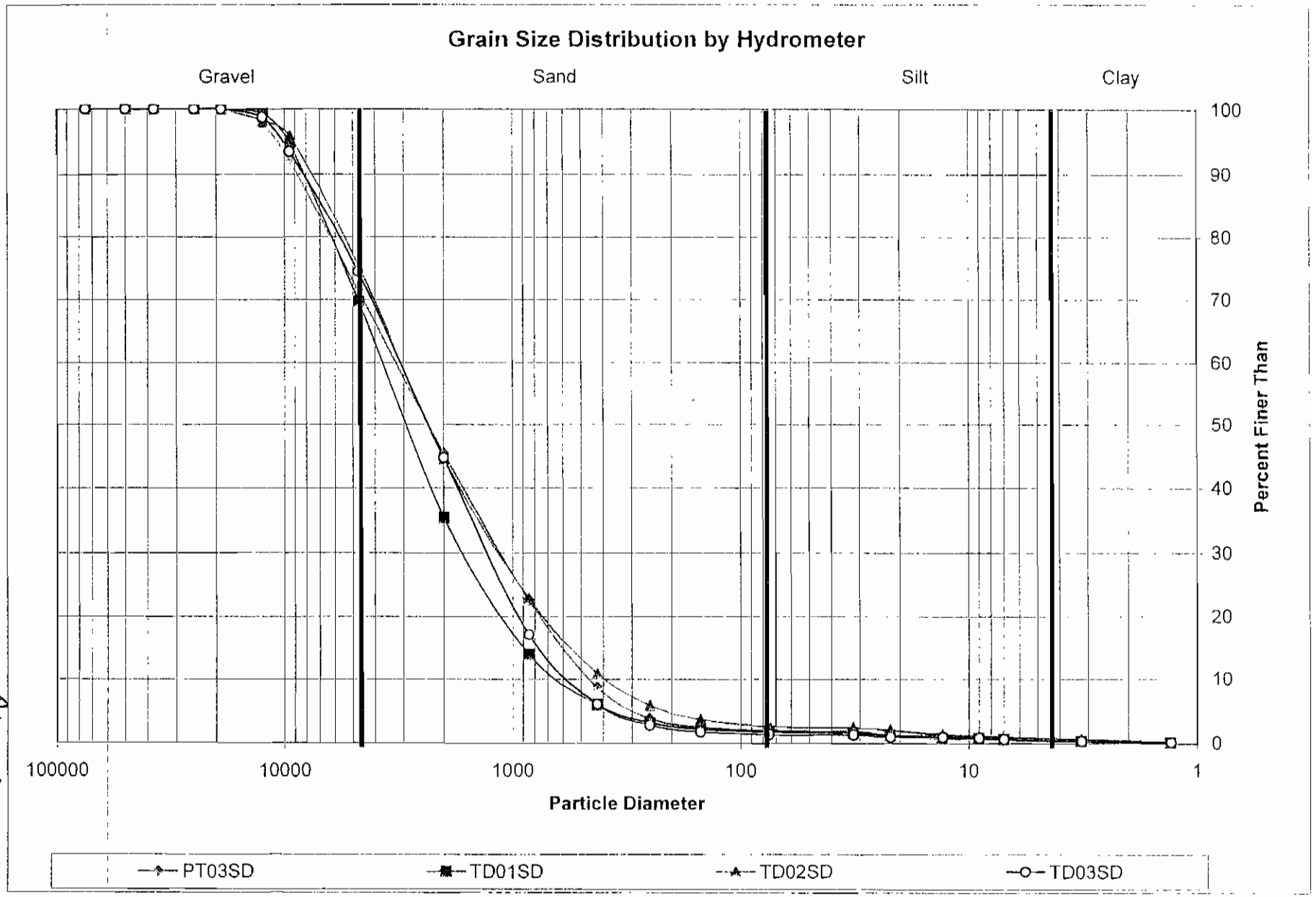
Sample ID	Date Sampled	Date Set up	Date Started	Date Complete	Data Qualifiers
PT02SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
CC01SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
CC02SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
CC03SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
JC01SD	9/21/2011	10/6/2011	10/10/2011	10/12/2011	
JC02SD	9/21/2011	10/6/2011	10/10/2011	10/12/2011	
JC03SD	9/21/2011	10/6/2011	10/10/2011	10/12/2011	
JC04SD	9/21/2011	10/6/2011	10/10/2011	10/12/2011	
PT01SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
PT03SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
TD01SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
TD02SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
TD03SD	9/20/2011	10/6/2011	10/10/2011	10/12/2011	
WC04SD	9/19/2011	10/6/2011	10/10/2011	10/12/2011	

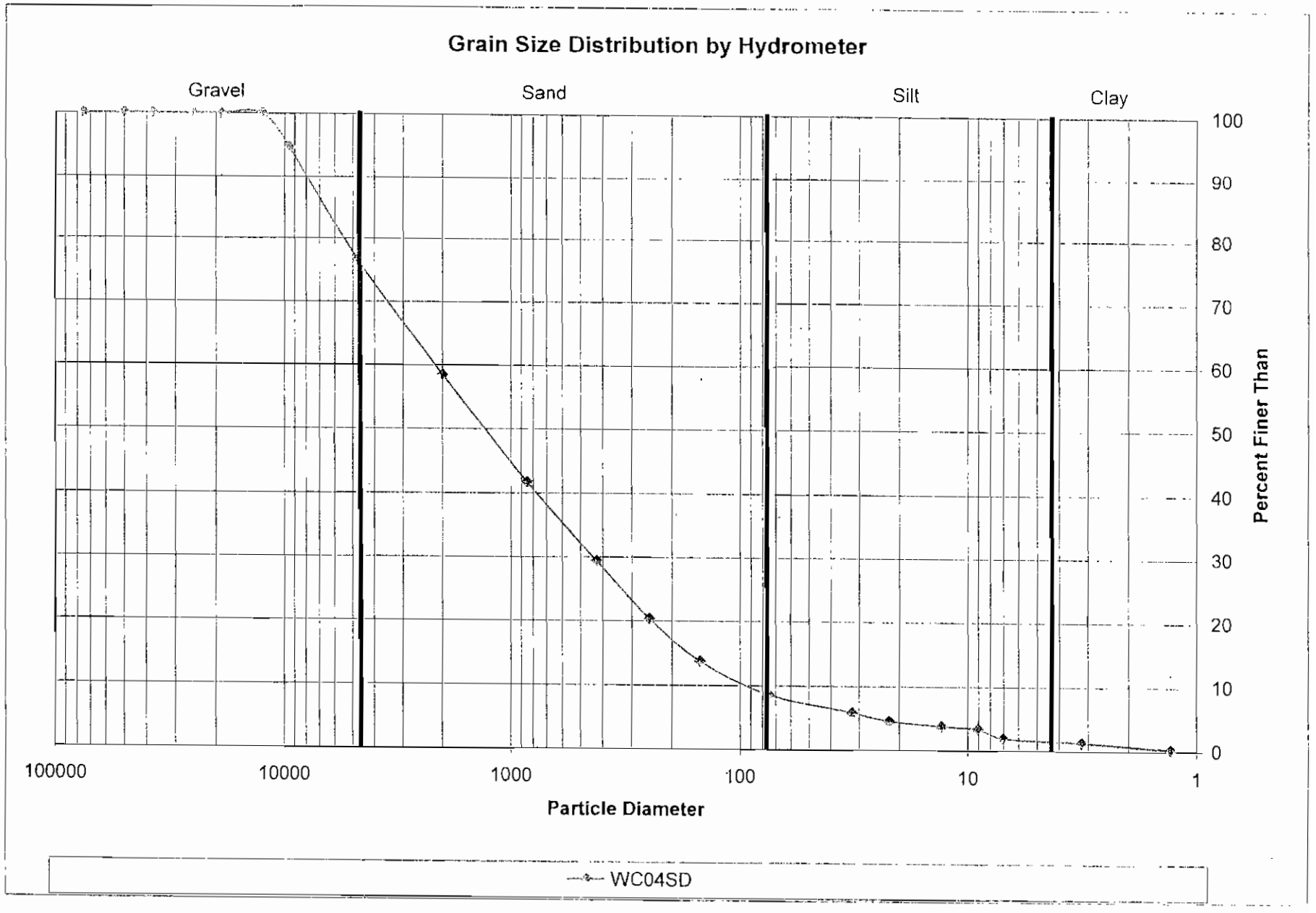
10/14/11


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
PT02SD
PT02SD
PT02SD


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
CC01SD
CC02SD
CC03SD
JC01SD


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
JC02SD
JC03SD
JC04SD
PT01SD


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
PT03SD
TD01SD
TD02SD
TD03SD


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
WC04SD

Ecology & Environment
CASE 41703

Percent Finer (Passing) Than the Indicated Size

Sieve Size (microns)	3"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4 (4750)	#10 (2000)	#20 (850)	#40 (425)	#60 (250)	#100 (150)	#200 (75)	32	22	13	9	7	3 2	1 3
WC01SD	100 0	100.0	100.0	100 0	100 0	98 0	92.8	83.6	70 9	61.0	48 8	35.8	23.6	12 1	7 9	5.8	5 4	5 0	4 3	2 5	1 4
	100.0	100.0	100 0	100.0	100.0	97 4	96.2	83 6	70 7	60 0	47.2	34.3	22 7	12 0	8 6	6.4	5 7	5 4	3 2	2.5	1 4
	100.0	100 0	100.0	100 0	100.0	90 2	83.3	70 3	60.3	52 0	41.5	30.4	20 0	10 4	7 3	5 8	4 9	4.3	3 7	1 8	0 9
DM01SD	100 0	100 0	100.0	100.0	100 0	100 0	100.0	100.0	100.0	97 7	68 9	21.7	6.8	3.7	3.4	3 0	3 0	3 0	1 7	1.3	0 9
DM02SD	100 0	100 0	100 0	100.0	100 0	97.4	91.3	71.5	36.7	15.3	5.5	2 5	1.8	1.5	1 4	1.2	1 2	1 2	1 2	0 3	0 3
DM03SD	100 0	100 0	100.0	100.0	100 0	100.0	100 0	99.9	90.2	52.3	21.5	7.3	4 4	3.8	3.7	3.7	3 3	3.0	1.5	0 7	0.4
DM04SD	100 0	100 0	100.0	100.0	100 0	99.4	97.3	93 5	74.0	52.6	29.3	12.5	5 4	2 9	2 8	2.5	2 5	1 2	1.2	0 6	0 6
WC02SD	100 0	100 0	100.0	100.0	100.0	100.0	92.5	86 1	74.7	63.6	51 9	38 4	26.0	14 1	9.8	7 9	6 4	5.4	3.9	2 9	1.0
WC03SD	100.0	100.0	100.0	100.0	100 0	93.6	88.4	74.2	57.9	43.5	32.8	24 1	16 5	9.6	6.8	5 0	4 1	3 5	2 9	1 5	0.6

Testing performed according to ASTM D421/D422

TN92

MW 1027-11

Ecology & Environment
CASE 41703

Percent Retained in Each Size Fraction

Description	%Coarse Gravel				% Gravel			% Coarse Sand	% Medium Sand		% Fine Sand			% Very Coarse Silt	% Coarse Silt	% Medium Silt	% Fine Silt	% Fine Silt	% Very Fine Silt	% Clay
rticle Size (microns)	3-2"	2-1 1/2"	1 1/2"-1"	1-3/4"	3/4-1/2"	1/2-3/8"	3/8"-4750	4750-2000	2000-850	850-425	425-250	250-150	150-75	75-32	32-22	22-13	13-9	9-7	7-3 2	<3 2
WC01SD	0.0	0.0	0.0	0.0	2 0	5 3	9.2	12.7	10.0	12 2	13 0	12 1	11 5	4 2	2 2	0 4	0 4	0 7	1.8	2 5
	0.0	0.0	0 0	0.0	2 6	1 2	12.7	12.8	10.7	12 8	12 9	11.6	10.7	3.4	2 1	0.7	0 4	2 1	0.7	2.5
	0.0	0.0	0 0	0.0	9.8	6 8	13 0	10.0	8.3	10.4	11.2	10 3	9 6	3 1	1 5	0.9	0 6	0 6	1 8	1 8
DM01SD	0.0	0.0	0 0	0.0	0 0	0.0	0.0	0.0	2 3	28.8	47 2	14 8	3 2	0 2	0.4	0 0	0.0	1.3	0 4	1 3
DM02SD	0.0	0.0	0 0	0.0	2.6	6 0	19.8	34.8	21.4	9 7	3 0	0.7	0.2	0 1	0 2	0.0	0 0	0 0	0.9	0 3
DM03SD	0 0	0 0	0.0	0.0	0.0	0.0	0.1	9.7	37.9	30.8	14 2	2 9	0.6	0 1	0.0	0.4	0 4	1 5	0 7	0 7
DM04SD	0.0	0.0	0 0	0 0	0 6	2.1	3.8	19.5	21 4	23 4	16.7	7.1	2 5	0.1	0.3	0 0	1.2	0.0	0.6	0 6
WC02SD	0.0	0.0	0.0	0.0	0 0	7 5	6 4	11 4	11 0	11 8	13 4	12 4	11.9	4.3	2 0	1 5	1 0	1 5	1.0	2.9
WC03SD	0.0	0.0	0.0	0 0	6 4	5.2	14 2	16.3	14 3	10 7	8 8	7 6	6 9	2 9	1.8	0.9	0 6	0 6	1 5	1 5

MW 1022-11

TN92

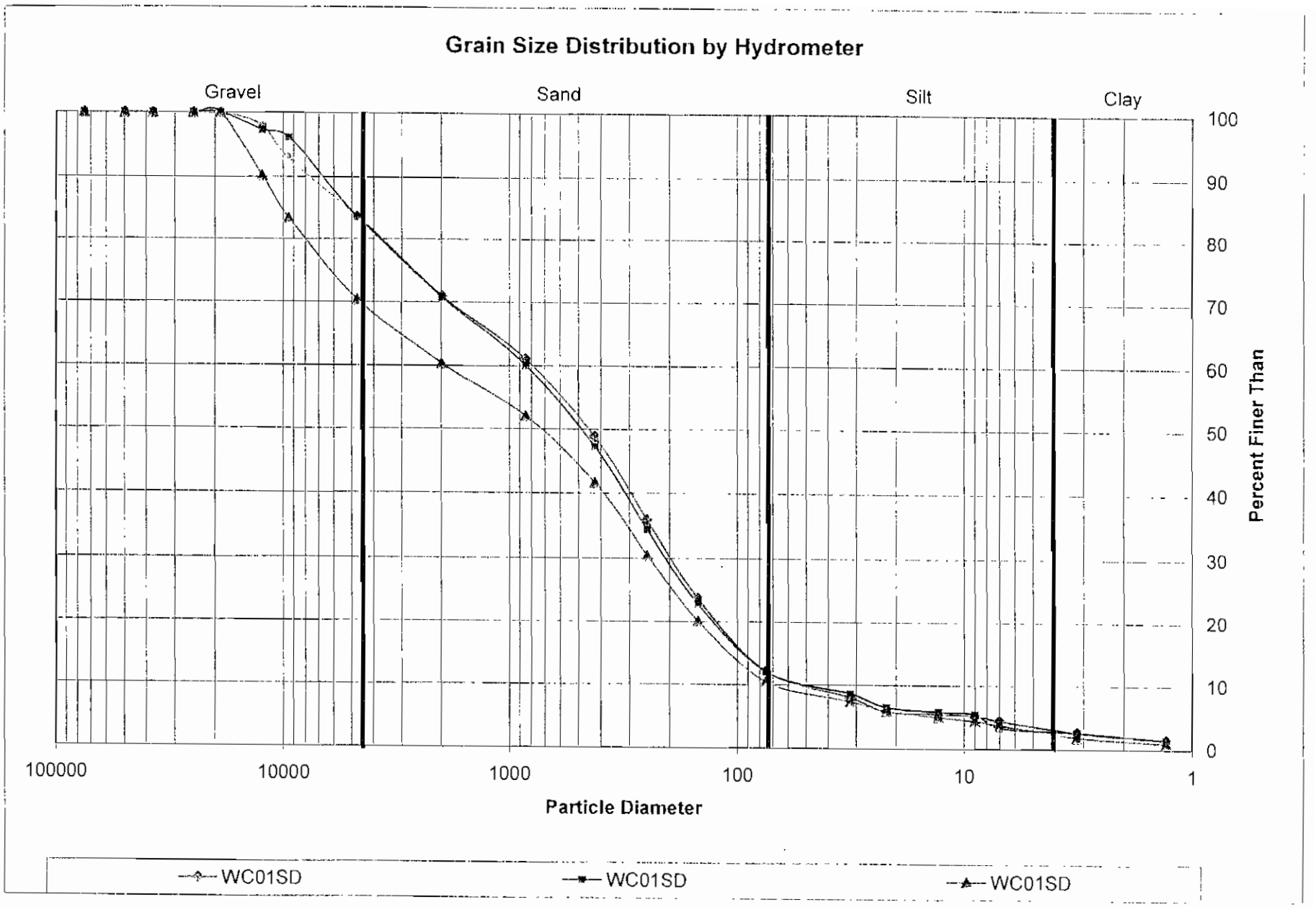
Client	Ecology & Environment	Project No	CASE 41703
ARI Triplicate Sample ID	TN92E	Batch No	TN92-01
Client Triplicate Sample ID	WC01SD	Page	1 of 1

Relative Standard Deviation, By Size

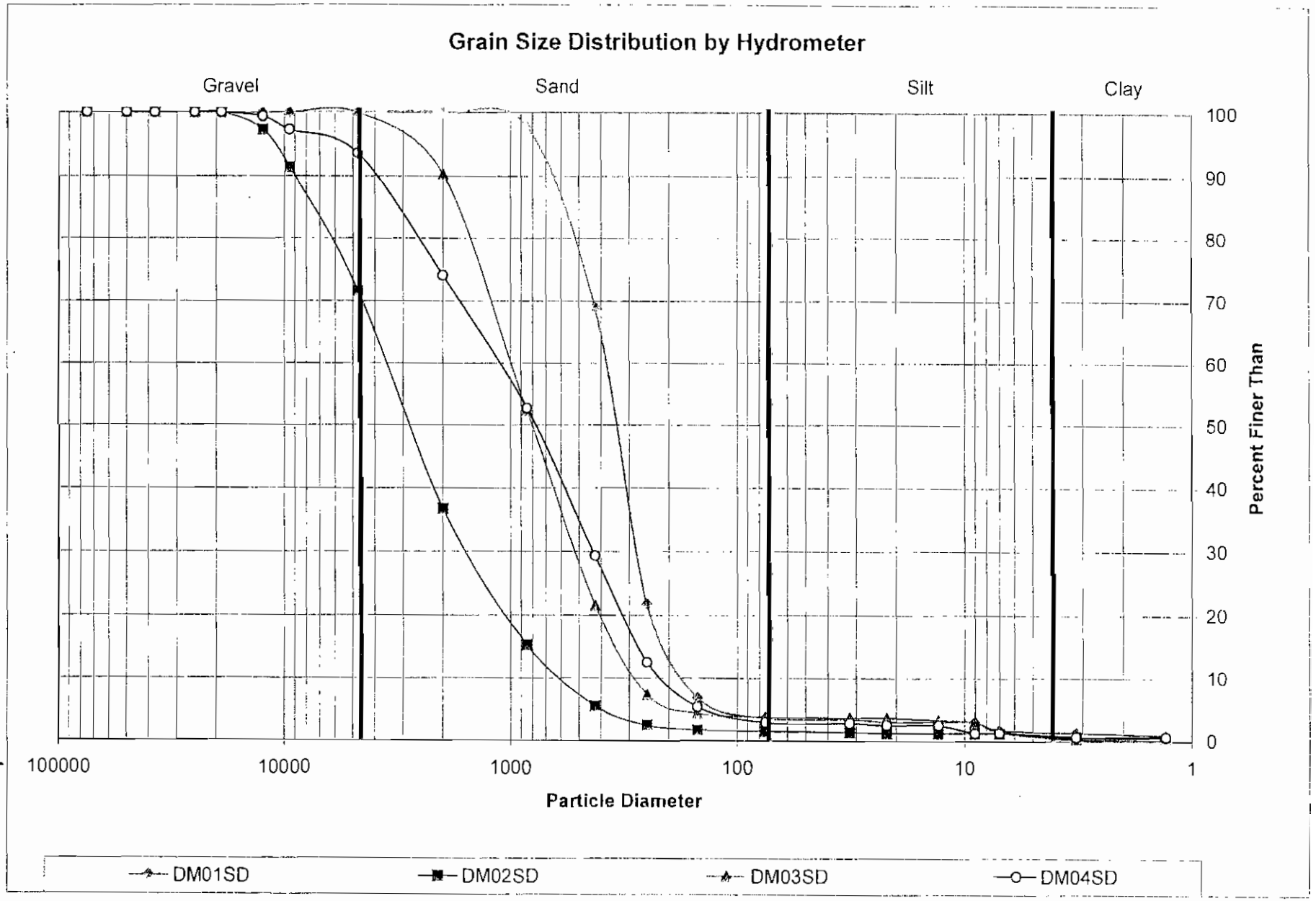
Sample ID	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	32	22	13	9	7	3 2	1 3
WC01SD	100 0	100.0	100.0	100.0	100.0	98.0	92.8	83.6	70.9	61 0	48.8	35.8	23.8	12 1	7 9	5.8	5.4	5 0	4.3	2.5	1 4
WC01SD	100.0	100.0	100.0	100 0	100.0	97.4	96.2	83.6	70.7	60 0	47 2	34 3	22 7	12 0	8.6	6.4	5.7	5 4	3.2	2 5	1 4
WC01SD	100.0	100.0	100.0	100.0	100.0	90.2	83.3	70.3	60.3	52 0	41 5	30.4	20 0	10 4	7 3	5.8	4 9	4 3	3.7	1 8	0 9
AVE	100 00	100.00	100 00	100.00	100 00	95.21	90 78	79.16	67 32	57 64	45.84	33.45	22.11	11.51	7.94	6.00	5 33	4 89	3 73	2.28	1 26
STDEV	0.00	0.00	0.00	0 00	0.00	4.37	6.68	7 86	6.07	4 91	3.80	2 79	1 87	0.92	0.63	0.38	0.42	0 55	0.55	0 39	0 30
%RSD	0.00	0.00	0.00	0 00	0.00	4.59	7 36	9 68	9.02	8.53	8.28	8.34	8.48	8.01	7 94	6 39	7 93	11.45	14.77	17 17	23 75

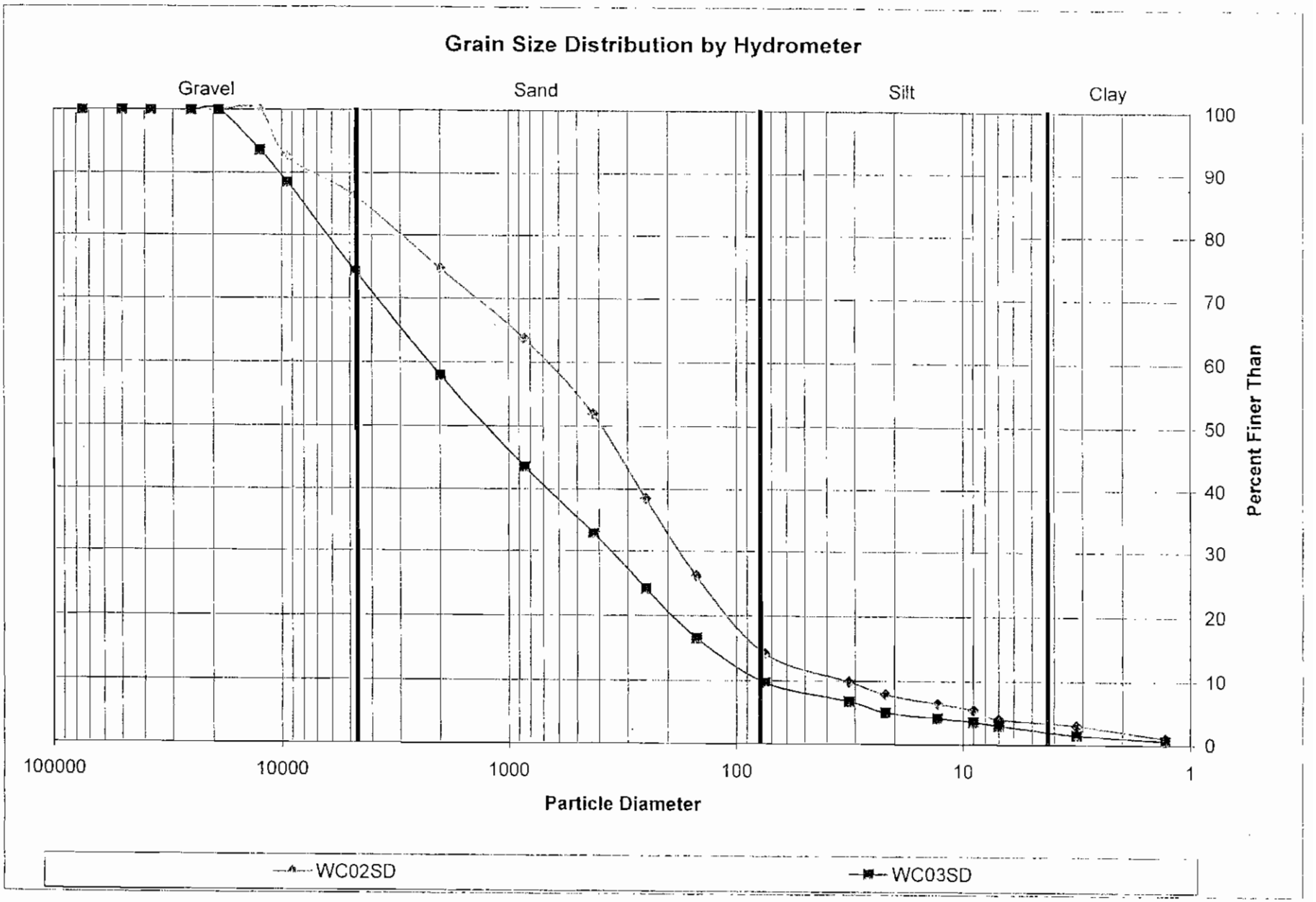
This Triplicate applies to the Batch Containing the Following Samples

Sample ID	Date Sampled	Date Set up	Date Started	Date Complete	Data Qualifiers
WC01SD	9/19/2011	10/6/2011	10/11/2011	10/13/2011	
	9/19/2011	10/6/2011	10/11/2011	10/13/2011	
	9/19/2011	10/6/2011	10/11/2011	10/13/2011	
DM01SD	9/22/2011	10/6/2011	10/11/2011	10/13/2011	
DM02SD	9/22/2011	10/6/2011	10/11/2011	10/13/2011	
DM03SD	9/22/2011	10/6/2011	10/11/2011	10/13/2011	
DM04SD	9/22/2011	10/6/2011	10/11/2011	10/13/2011	
WC02SD	9/19/2011	10/6/2011	10/11/2011	10/13/2011	
WC03SD	9/19/2011	10/6/2011	10/11/2011	10/13/2011	


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
WC01SD
WC01SD
WC01SD

MW 10-27-11


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
DM01SD
DM02SD
DM03SD
DM04SD


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
WC02SD
WC03SD

Sample Number	PT02SD	100.00	100.00	100.00	100.00	100.00	100.00	97.95	96.85	91.92	89.89	82.89	57.99	32.10	22.02	17.10	13.00	11.09	9.18	7.65	7.26	3.82	1.91	
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	33.7	21.8	12.7	9.1	6.4	3.2	1.4	
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200								
Specific Gravity	2.65																							
					Sieve Analysis Portion						Hydrometer Analysis Portion													
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a						
					5"	10.61	0.00		0.00	100.00														
					3"	10.61	0.00		0.00	100.00														
					2"	10.61	0.00		0.00	100.00														
Wet Wt & Tare	24.35				1.5"	10.61	0.00		0.00	100.00	1	25	5.0	15.29	12.2	46.68878	0.013367	1.001385						
Dry Wt & Tare	23.7				1	10.61	0.00		0.00	100.00	2	22	5.0	13.00	12.7	33.67264	0.013367	1.001385						
Wt Moisture	0.65				3/4	10.61	0.00		0.00	100.00	5	18.5	5.0	11.09	13.1	21.63748	0.013367	1.001385						
Wt Tare	1.53				1/2	14	3.39		2.05	97.95	15	17	5.0	9.18	13.5	12.68824	0.013367	1.001385						
Dry Soil	22.17				3/8	15.81	5.20		3.15	96.85	30	15	5.0	7.65	13.8	9.078892	0.013367	1.001385						
Moisture Content	0.029318899				4	23.95	13.34		8.08	91.92	60	14.5	5.0	7.26	13.9	6.436563	0.013367	1.001385						
Air Dry Total Sample	168.5				10	27.64	17.03		10.31	89.89	250	10	5.0	3.82	14.7	3.236726	0.013367	1.001385						
Oven Dry Total Samp	165.1570771				20	36.55	8.91	6.80	17.11	82.89	1440	8	5.5	1.91	15.0	1.363831	0.013367	1.001385						
Air Dry Hydro Sample	120.91				40	69.16	41.52	31.70	42.01	57.99														
Oven Dry Wt Hydro	117.4660254				60	103.06	75.42	57.59	67.90	32.10														
Amount Plus #10	17.03				100	116.27	88.63	67.67	77.88	22.02														
W (14.2) =	130.9709595				200	122.71	95.07	72.59	82.90	17.10														

11-26-11 MW

Sample Number	PT0290	100.00	100.00	100.00	100.00	100.00	100.00	100.00	97.90	91.25	88.28	81.02	56.59	31.33	21.16	16.17	12.77	10.89	8.26	7.51	6.76	3.76	1.88
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	33.7	21.6	12.8	9.1	6.5	3.2	1.4
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	80	100	200							
Specific Gravity	2.65																						
					Sieve Analysis Portion																		
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a						
					5"	10.56	0.00		0.00	100.00													
					3"	10.56	0.00		0.00	100.00													
					2"	10.56	0.00		0.00	100.00													
Wet Wt & Tare	21.1				1.5"	10.56	0.00		0.00	100.00	1	24	5	14.27	12.4	47.00134	0.013367	1.001385					
Dry Wt & Tare	20.65				1	10.56	0.00		0.00	100.00	2	22	5	12.77	12.7	33.67264	0.013367	1.001385					
Wt Moisture	0.45				3/4	10.56	0.00		0.00	100.00	5	19.5	5	10.89	13.1	21.83748	0.013367	1.001385					
Wt Tare	1.5				1/2	10.56	0.00		0.00	100.00	15	18	5	8.26	13.7	12.76296	0.013367	1.001385					
Dry Soil	19.15				3/8	13.86	3.30		2.10	97.90	30	15	5	7.51	13.8	9.078692	0.013367	1.001385					
Moisture Content	0.023498695				4	24.33	13.77		8.75	91.25	60	14	5	6.76	14.0	6.457506	0.013367	1.001385					
Air Dry Total Sample	180.72				10	29.02	18.46		11.72	88.28	250	10	5	3.76	14.7	3.238726	0.013367	1.001385					
Oven Dry Total Samp	157.4538265				20	38.89	9.87	7.25	18.98	81.02	1440	8	5.5	1.88	15.0	1.363631	0.013367	1.001385					
Air Dry Hydro Sample	120.46				40	71.27	42.25	31.89	43.41	56.59													
Oven Dry Wt Hydro	117.6943387				80	104.95	75.93	56.95	68.67	31.33													
Amount Plus #10	18.46				100	118.5	89.48	67.11	78.84	21.16													
W (14.2) =	133.3255163				200	125.15	96.13	72.10	83.83	16.17													

MW 10-27-11

Sample Number	PT02SD	100 00	100.00	100 00	100.00	100 00	100 00	100.00	96 76	92 62	88.86	81 37	55.73	29 94	20 11	15 41	12 88	10 60	9.09	8 33	6.82	3.79	1 89
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	33 7	21.7	12 7	9 0	6 5	3.2	1 4
Test Temperature	21 5	5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2 65																						
					Sieve Analysis Portion						Hydrometer Analysis Portion												
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a					
					5"	9.77	0.00		0.00	100 00													
					3"	9 77	0 00		0.00	100.00													
					2"	9 77	0.00		0.00	100.00													
Wet Wt & Tare	21 29				1 1/2"	9 77	0.00		0 00	100.00	1	24 5	5	14.77	12 3	46.84532	0 013367	1 001385					
Dry Wt & Tare	20.82				1	9.77	0.00		0.00	100.00	2	22	5	12.88	12 7	33.67264	0.013367	1 001385					
Wt Moisture	0 47				3/4	9.77	0.00		0 00	100 00	5	19	5	10.60	13 2	21 70504	0.013367	1.001385					
Wt Tare	1 52				1/2	9 77	0.00		0.00	100.00	15	17	5	9 09	13.5	12.68624	0.013367	1 001385					
Dry Soil	19.3				3/8	14 98	5.21		3.24	96 76	30	16	5	8 33	13 7	9.024773	0.013367	1 001385					
Moisture Content	0 024352332				4	21.64	11 87		7 38	92.62	60	14	5	6.82	14 0	6 457506	0 013367	1 001385					
Air Dry Total Sample	164.39				10	27 89	17 92		11 14	88.86	250	10	5	3.79	14 7	3 236726	0.013367	1 001385					
Oven Dry Total Samp	160.907911				20	37.6	9.91	7.50	16.63	81 37	1440	8	5.5	1 89	15 0	1 363631	0.013367	1 001385					
Air Dry Hydro Sample	120.35				40	71 5	43.81	33.14	44.27	55.73													
Oven Dry Wt Hydro	117.486872				60	105.8	77 91	58.93	70.06	29.94													
Amount Plus #10	17.92				100	118.59	90.80	68.75	79.89	20.11													
W (14.2) =	132.2131978				200	124.8	97.11	73.45	84.59	15.41													

MW 10-27-11

Sample Number:	CC01SD	100.00	100.00	100.00	100.00	100.00	100.00	100.00	93.91	74.77	57.20	44.86	35.55	31.96	28.21	24.04	17.88	13.94	11.21	9.70	8.18	4.55	2.42
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	30.8	20.5	12.2	8.8	6.3	3.2	1.4
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						
					Sieve Analysis Portion						Hydrometer Analysis Portion												
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a					
					5"	10.58	0.00		0.00	100.00													
					3"	10.58	0.00		0.00	100.00													
					2"	10.58	0.00		0.00	100.00													
Wet Wt & Tare	13.28				1.5"	10.58	0.00		0.00	100.00	1	38	5	20.00	10.1	42.41843	0.013387	1.001385					
Dry Wt & Tare	12.88				1	10.58	0.00		0.00	100.00	2	34.5	5	17.88	10.8	30.83542	0.013387	1.001385					
Wt Moisture	0.4				3/4	10.58	0.00		0.00	100.00	5	28	5	13.94	11.7	20.45478	0.013387	1.001385					
Wt Tare	1.53				1/2	10.58	0.00		0.00	100.00	15	23.5	5	11.21	12.4	12.17584	0.013387	1.001385					
Dry Soil	11.35				3/8	22.49	11.91		6.09	93.91	30	21	5	9.70	12.9	8.750195	0.013387	1.001385					
Moisture Content	0.035242291				4	59.94	49.36		25.23	74.77	60	18.5	5	8.18	13.3	6.28515	0.013387	1.001385					
Air Dry Total Sample	199.57				10	94.31	83.73		42.80	57.20	250	12.5	5	4.55	14.2	3.191188	0.013387	1.001385					
Oven Dry Total Samp	195.6265106				20	114.7	20.39	12.34	55.14	44.86	1440	9.5	5.5	2.42	14.7	1.3524	0.013387	1.001385					
Air Dry Hydro Sample	97.83				40	128.21	33.90	20.52	69.32	30.68													
Oven Dry Wt Hydro	94.49981702				60	136.01	41.70	25.24	68.04	31.96													
Amount Plus #10	83.73				100	142.21	47.90	28.99	71.79	28.21													
W (14.2) =	165.2118572				200	149.09	54.78	33.16	75.96	24.04													

9/14/22-11

Sample Number	CC02SD	100.00	100.00	100.00	100.00	100.00	100.00	100.00	98.84	88.99	68.51	46.22	29.26	19.92	15.30	12.24	10.83	10.02	8.94	7.58	5.98	4.60	3.25
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	33.0	21.1	12.3	8.9	6.4	3.2	1.3
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						
					Sieve Analysis Portion						Hydrometer Analysis Portion												
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a						
					5"	9.86	0.00		0.00	100.00													
					3"	9.86	0.00		0.00	100.00													
					2"	9.86	0.00		0.00	100.00													
Wet Wt & Tare	33.25				1.5"	9.86	0.00		0.00	100.00	1	28	5	11.37	12.0	46.37412	0.013387	1.001385					
Dry Wt & Tare	32.79				1	9.86	0.00		0.00	100.00	2	25	5	10.83	12.2	33.01395	0.013387	1.001385					
Wt Moisture	0.52				3/4	9.86	0.00		0.00	100.00	5	23.5	5	10.02	12.4	21.08918	0.013387	1.001385					
Wt Tare	1.49				1/2	9.86	0.00		0.00	100.00	15	21.5	5	8.94	12.6	12.33514	0.013387	1.001385					
Dry Soil	31.24				3/8	13.78	3.92		1.16	98.84	30	19	5	7.58	13.2	8.861047	0.013387	1.001385					
Moisture Content	0.016645327				4	46.96	37.10		11.01	88.99	60	18	5	5.98	13.7	6.381478	0.013387	1.001385					
Air Dry Total Sample	340.89				10	115.99	106.13		31.49	68.51	250	13.5	5	4.60	14.1	3.172762	0.013387	1.001385					
Oven Dry Total Samp	337.0483224				20	157.21	41.22	22.29	53.78	46.22	1440	11.5	5.5	3.25	14.4	1.337279	0.013387	1.001385					
Air Dry Hydro Sample	128.79				40	188.56	72.57	39.25	70.74	29.26													
Oven Dry Wt Hydro	126.6813476				60	205.63	89.64	46.59	80.08	19.92													
Amount Plus #10	106.13				100	214.39	98.40	53.22	84.70	15.30													
W (14.2) =	184.9045658				200	220.04	104.05	56.27	87.76	12.24													

D

Sample Number	CC03SD	100.00	100.00	100.00	100.00	100.00	100.00	100.00	97.67	81.34	62.97	48.48	40.59	33.78	27.70	22.68	19.65	17.13	15.12	12.60	11.59	7.56	4.79
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	28.5	18.8	11.2	8.2	5.9	3.1	1.3
Test Temperature	21.5 5"	3"		2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						
		Sieve Analysis Portion									Hydrometer Analysis Portion												
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a					
					5"	10.37	0.00		0.00	100.00													
					3"	10.37	0.00		0.00	100.00													
					2"	10.37	0.00		0.00	100.00													
Wet Wt & Tare	21.14				1.5"	10.37	0.00		0.00	100.00	1	47	5	21.18	8.6	39.18674	0.013367	1.001385					
Dry Wt & Tare	20.7				1	10.37	0.00		0.00	100.00	2	44	5	19.65	9.1	28.4908	0.013367	1.001385					
Wt Moisture	0.44				3/4	10.37	0.00		0.00	100.00	5	39	5	17.13	9.9	18.8142	0.013367	1.001385					
Wt Tare	1.51				1/2	10.37	0.00		0.00	100.00	15	35	5	15.12	10.6	11.21807	0.013367	1.001385					
Dry Soil	19.19				3/8	16.14	5.77		2.33	97.67	30	30	5	12.60	11.4	8.232909	0.013367	1.001385					
Moisture Content	0.022928609				4	56.82	46.25		18.66	81.34	60	28	5	11.59	11.7	5.904788	0.013367	1.001385					
Air Dry Total Sample	251.46				10	102.17	91.80		37.03	62.97	250	20	5	7.56	13.0	3.050417	0.013367	1.001385					
Oven Dry Total Samp	247.8812738				20	130.99	26.82	14.50	51.54	48.46	1440	15	5.5	4.79	13.8	1.310398	0.013367	1.001385					
Air Dry Hydro Sample	128.01				40	146.04	44.47	22.38	59.41	40.59													
Oven Dry Wt Hydro	125.1406979				60	160.17	58.60	29.18	66.22	33.78													
Amount Plus #10	91.80				100	172.25	70.68	35.28	72.30	27.70													
W (14.2) =	198.74284				200	182.23	80.66	40.28	77.32	22.68													

10-24-11

Sample Number:	JC01SD	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	97.65	76.44	34.81	16.91	7.30	3.35	2.21	2.06	1.55	1.29	1.29	1.03	0.77	0.52
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	38.4	23.1	13.4	9.5	6.7	3.3	1.4
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						
					Sieve Analysis Portion						Hydrometer Analysis Portion												
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a						
					5	10.02	0.00		0.00	100.00													
					3	10.02	0.00		0.00	100.00													
					2	10.02	0.00		0.00	100.00													
Wet Wt & Tare	40.48				1.5	10.02	0.00		0.00	100.00	1	10	5	2.58	14.7	51.17713	0.013367	1.001385					
Dry Wt & Tare	40.3				1	10.02	0.00		0.00	100.00	2	9	5	2.06	14.8	38.38943	0.013367	1.001385					
Wt Moisture	0.18				3/4	10.02	0.00		0.00	100.00	5	8	5	1.55	15.0	23.14159	0.013367	1.001385					
Wt Tare	1.52				1/2	10.02	0.00		0.00	100.00	15	7.5	5	1.29	15.1	13.39728	0.013367	1.001385					
Dry Soil	38.78				3/8	10.02	0.00		0.00	100.00	30	7.5	5	1.29	15.1	9.473309	0.013367	1.001385					
Moisture Content	0.004125838				4	17	6.98		2.15	97.85	60	7	5	1.03	15.2	6.718831	0.013367	1.001385					
Air Dry Total Sample	326.17				10	86.62	76.60		23.56	76.44	250	6.5	5	0.77	15.2	3.299449	0.013367	1.001385					
Oven Dry Total Samp	325.1445455				20	187.44	80.82	41.63	65.19	34.81	1440	6.5	5.5	0.52	15.2	1.374771	0.013367	1.001385					
Air Dry Hydro Sample	149				40	202.18	115.56	59.53	83.09	16.91													
Oven Dry Wt Hydro	148.3877761				60	220.84	134.22	69.14	92.70	7.30													
Amount Plus #10	76.60				100	228.5	141.88	73.09	96.65	3.35													
W (14.2) =	194.1200356				200	230.72	144.10	74.23	97.79	2.21													

MW 10-27-11

Sample Number:	JC02SD	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	98.27	59.68	27.14	10.11	3.38	1.68	1.18	0.98	0.78	0.78	0.59	0.39	0.39	0.00
		125000	75000	90000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	38.7	23.3	13.4	9.5	6.8	3.3	1.4
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

		Sieve Analysis Portion						Hydrometer Analysis Portion														
		Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a							
		5	9.87	0.00		0.00	100.00															
		3	9.87	0.00		0.00	100.00															
		2	9.87	0.00		0.00	100.00															
Wet Wt & Tare	39.91	1.5	9.87	0.00		0.00	100.00	1	8.5	5	1.37	14.9	51.60449	0.013367	1.001385							
Dry Wt & Tare	39.82	1	9.87	0.00		0.00	100.00	2	7.5	5	0.98	15.1	36.68997	0.013367	1.001385							
Wt Moisture	0.09	3/4	9.87	0.00		0.00	100.00	5	7	5	0.78	15.2	23.26779	0.013367	1.001385							
Wt Tare	1.52	1/2	9.87	0.00		0.00	100.00	15	7	5	0.78	15.2	13.43366	0.013367	1.001385							
Dry Soil	38.3	3/8	9.87	0.00		0.00	100.00	30	6.5	5	0.59	15.2	9.524889	0.013367	1.001385							
Moisture Content	0.002349869	4	22.16	12.29		3.73	96.27	60	6	5	0.39	15.3	6.753065	0.013367	1.001385							
Air Dry Total Sample	329.77	10	142.66	132.79		40.32	59.68	250	6	5	0.39	15.3	3.308313	0.013367	1.001385							
Oven Dry Total Samp	329.3082079	20	225.89	83.23	32.54	72.86	27.14	1440	5.5	5.5	0.00	15.4	1.382147	0.013367	1.001385							
Air Dry Hydro Sample	153	40	289.43	126.77	49.56	89.69	10.11															
Oven Dry Wt Hydro	152.6413128	60	286.85	143.99	56.29	96.82	3.38															
Amount Plus #10	132.79	100	291	148.34	57.99	98.32	1.68															
W (14.2) =	255.7831039	200	292.28	149.62	58.49	98.82	1.18															

Sample Number:	JC03SD	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.01	92.89	78.60	37.88	12.14	3.50	1.63	1.12	1.05	0.78	0.78	0.78	0.52	0.52	0.00
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	38.8	23.3	13.5	9.5	6.8	3.3	1.4
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

					Sieve Analysis Portion						Hydrometer Analysis Portion												
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a					
					5	10.02	0.00		0.00	100.00													
					3	10.02	0.00		0.00	100.00													
					2	10.02	0.00		0.00	100.00													
Wet Wt & Tare	53.9				1.5	10.02	0.00		0.00	100.00	1	7	5	1.05	15.2	52.02835	0.013367	1.001385					
Dry Wt & Tare	53.81				1	10.02	0.00		0.00	100.00	2	7	5	1.05	15.2	36.7896	0.013367	1.001385					
Wt Moisture	0.09				3/4	10.02	0.00		0.00	100.00	5	6.5	5	0.78	15.2	23.33063	0.013367	1.001385					
Wt Tare	1.49				1/2	10.02	0.00		0.00	100.00	15	6.5	5	0.78	15.2	13.46995	0.013367	1.001385					
Dry Soil	52.32				3/8	13.24	3.22		0.99	99.01	30	6.5	5	0.78	15.2	9.524689	0.013367	1.001385					
Moisture Content	0.001720183				4	33.27	23.25		7.11	92.89	60	6	5	0.52	15.3	6.753065	0.013367	1.001385					
Air Dry Total Sample	327.27				10	86.49	76.47		23.40	76.60	250	6	5	0.52	15.3	3.308313	0.013367	1.001385					
Oven Dry Total Samp	326.8393168				20	161.06	74.57	38.93	62.32	37.68	1440	5.5	5.5	0.00	15.4	1.382147	0.013367	1.001385					
Air Dry Hydro Sample	147				40	209.98	123.49	64.48	87.88	12.14													
Oven Dry Wt Hydro	146.7475673				60	228.54	140.05	73.11	96.50	3.50													
Amount Plus #10	78.47				100	230.11	143.62	74.97	98.37	1.63													
W (14.2) =	191.5885003				200	231.1	144.61	75.49	98.88	1.12													

MW 16-21

Sample Number:	JC04SD	100.00	100.00	100.00	100.00	100.00	100.00	98.99	96.42	81.52	47.52	22.89	8.55	2.85	1.14	0.70	0.63	0.63	0.63	0.63	0.63	0.42	0.00	
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	36.7	23.2	13.4	9.5	6.7	3.3	1.4	
Test Temperature	21.5.5°	3"		2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200								
Specific Gravity	2.65																							
					Sieve Analysis Portion						Hydrometer Analysis Portion													
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a						
					5	10.43	0.00		0.00	100.00														
					3	10.43	0.00		0.00	100.00														
					2	10.43	0.00		0.00	100.00														
Wet Wt & Tare	31.53				1.5	10.43	0.00		0.00	100.00	1	7.5	6	0.63	15.1	51.88745	0.013367	1.001385						
Dry Wt & Tare	31.43				1	10.43	0.00		0.00	100.00	2	7.5	6	0.63	15.1	36.68997	0.013367	1.001385						
Wt Moisture	0.1				3/4	10.43	0.00		0.00	100.00	5	7.5	6	0.63	15.1	23.20477	0.013367	1.001385						
Wt Tare	1.5				1/2	13.56	3.13		1.01	98.99	15	7.5	6	0.63	15.1	13.39728	0.013367	1.001385						
Dry Soil	29.93				3/8	21.52	11.09		3.58	96.42	30	7.5	6	0.63	15.1	9.473309	0.013367	1.001385						
Moisture Content	0.003341129				4	87.87	57.24		18.48	81.52	60	7.5	6	0.63	15.1	6.698641	0.013367	1.001385						
Air Dry Total Sample	310.17				10	172.94	162.51		52.48	47.52	250	7	6	0.42	15.2	3.290582	0.013367	1.001385						
Oven Dry Total Samp	309.6782917				20	231.84	58.90	24.64	77.11	22.89	1440	6.5	6.5	0.00	15.2	1.374771	0.013367	1.001385						
Air Dry Hydro Sample	114				40	266.12	93.18	38.97	91.45	8.55														
Oven Dry Wt Hydro	113.6203796				60	280.22	107.28	44.87	97.35	2.85														
Amount Plus #10	162.51				100	283.64	110.90	46.39	98.86	1.14														
W (14.2) =	239.0852313				200	284.88	111.94	46.82	99.30	0.70														

Sample Number:	PT01SD	100.00	100.00	100.00	100.00	100.00	100.00	98.43	94.45	84.88	57.00	24.79	11.22	7.28	5.71	4.56	4.38	3.83	3.29	3.01	1.64	1.64	0.27
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	35.4	22.5	13.1	9.3	6.6	3.1	1.4
Test Temperature	21.5 6"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200								
Specific Gravity	2.65																						

		Sieve Analysis Portion						Hydrometer Analysis Portion							
		Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
		5"	10.88	0.00		0.00	100.00								
		3"	10.88	0.00		0.00	100.00								
		2"	10.88	0.00		0.00	100.00								
Wet Wt & Tare	21.56	1.5"	10.88	0.00		0.00	100.00	1	15	6	4.93	13.8	49.72805	0.013387	1.001385
Dry Wt & Tare	21.31	1"	10.88	0.00		0.00	100.00	2	14	6	4.38	14.0	35.36922	0.013387	1.001385
Wt Moisture	0.25	3/4"	10.88	0.00		0.00	100.00	5	13	6	3.83	14.2	22.49999	0.013387	1.001385
Wt Tare	1.51	1/2"	14.15	3.48		1.57	98.43	15	12	6	3.29	14.3	13.0653	0.013387	1.001385
Dry Soil	19.8	3/8"	23.02	12.36		5.55	94.45	30	11.5	6	3.01	14.4	9.284939	0.013387	1.001385
Moisture Content	0.012626263	4	44.36	33.70		15.12	84.88	60	9	6	1.64	14.8	6.643771	0.013387	1.001385
Air Dry Total Sample	224.45	10	106.49	95.83		43.00	57.00	287	9	6	1.64	14.8	3.14945	0.013387	1.001385
Oven Dry Total Samp	222.8462594	20	165.38	58.87	32.21	75.21	24.79	1440	7	6.5	0.27	15.2	1.371087	0.013387	1.001385
Air Dry Hydro Sample	105.5	40	190.17	83.68	45.78	88.78	11.22								
Oven Dry Wt Hydro	104.1845387	60	197.4	90.91	49.74	92.74	7.26								
Amount Plus #10	95.83	100	200.23	93.74	51.28	94.29	5.71								
W (14.2) =	182.7886826	200	202.34	95.85	52.44	95.44	4.56								

Sample Number:	PT03SD	100.00	100.00	100.00	100.00	100.00	100.00	97.54	92.03	71.37	45.33	22.52	8.61	3.74	2.43	1.92	1.79	1.25	1.25	1.07	0.72	0.36	0.18	
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	36.0	23.0	13.3	8.3	8.2	3.2	1.4	
Test Temperature	21.5 5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200									
Specific Gravity	2.65																							
					Sieve Analysis Portion																			
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a							
					5"	10.31	0.00		0.00	100.00														
					3"	10.31	0.00		0.00	100.00														
					2"	10.31	0.00		0.00	100.00														
Wet Wt & Tare	37.1				1.5"	10.31	0.00		0.00	100.00	1	12	8	2.15	14.3	50.60189	0.013387	1.001385						
Dry Wt & Tare	36.19				1"	10.31	0.00		0.00	100.00	2	11	8	1.79	14.5	35.98482	0.013387	1.001385						
Wt Moisture	0.91				3/4"	10.31	0.00		0.00	100.00	5	9.5	8	1.25	14.7	22.95099	0.013387	1.001385						
Wt Tare	1.52				1/2"	21.3	10.99		2.46	97.54	15	9.5	8	1.25	14.7	13.25076	0.013387	1.001385						
Dry Soil	34.67				3/8"	45.94	35.63		7.97	92.03	38	9	8	1.07	14.8	8.348309	0.013387	1.001385						
Moisture Content	0.026247478				4	138.32	128.01		28.83	71.37	70	8	8	0.72	15.0	6.18485	0.013387	1.001385						
Air Dry Total Sample	452.36				10	254.72	244.41		54.67	45.33	259	7	8	0.36	15.2	3.232884	0.013387	1.001385						
Oven Dry Total Samp	447.0414362				20	318.45	83.73	22.80	77.48	22.52	1440	7	8.5	0.18	15.2	1.371067	0.013387	1.001385						
Air Dry Hydro Sample	130				40	357.34	102.62	36.72	91.39	8.61														
Oven Dry Wt Hydro	126.67509884				60	370.94	116.22	41.59	96.26	3.74														
Amount Plus #10	244.41				100	374.8	119.88	42.90	97.57	2.43														
W (14.2) =	279.4680775				200	378.04	121.32	43.41	98.08	1.92														

11-21-01 MW

Sample Number	TD01SD	100.00	100.00	100.00	100.00	100.00	100.00	99.32	94.70	66.64	35.30	13.93	5.82	3.11	2.17	1.76	1.56	1.25	0.78	0.78	0.62	0.31	0.16	
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	38.0	22.9	13.3	9.4	6.7	3.3	1.4	
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200								
Specific Gravity	2.65																							
					Sieve Analysis Portion						Hydrometer Analysis Portion													
					Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a							
					5	10.38	0.00		0.00	100.00														
					3	10.38	0.00		0.00	100.00														
					2	10.38	0.00		0.00	100.00														
Wet Wt & Tare	39.58				1.5	10.38	0.00		0.00	100.00	1	12	8	1.87	14.3	50.80189	0.013367	1.001385						
Dry Wt & Tare	38.47				1	10.38	0.00		0.00	100.00	2	11	8	1.56	14.5	35.98482	0.013367	1.001385						
Wt Moisture	1.09				3/4	10.38	0.00		0.00	100.00	5	10	8	1.25	14.7	22.88711	0.013367	1.001385						
Wt Tare	1.53				1/2	13.74	3.36		0.88	99.32	15	8.5	8	0.78	14.9	13.32422	0.013367	1.001385						
Dry Soil	36.94				3/8	38.64	28.28		5.30	94.70	30	8.5	8	0.78	14.9	9.421649	0.013367	1.001385						
Moisture Content	0.029507309				4	160.98	150.62		30.36	69.64	60	8	8	0.62	15.0	6.680401	0.013367	1.001385						
Air Dry Total Sample	501.33				10	331.4	321.04		64.70	35.30	250	7	8	0.31	15.2	3.290582	0.013367	1.001385						
Oven Dry Total Samp	486.1828032				20	399.9	68.50	21.37	86.07	13.93	1440	7	8.5	0.16	15.2	1.371087	0.013367	1.001385						
Air Dry Hydro Sample	116.5				40	425.9	94.50	29.47	94.18	5.82														
Oven Dry Wt Hydro	113.1809256				60	434.59	103.19	32.19	96.89	3.11														
Amount Plus #10	321.04				100	437.61	106.21	33.13	97.83	2.17														
W(14.2) =	320.8109228				200	438.92	107.52	33.54	98.24	1.76														

11-27-01 MW

Sample Number	TD02SD		100.00	100.00	100.00	100.00	100.00	100.00	98.22	95.61	75.36	44.49	22.77	10.79	6.75	3.83	2.56	2.35	2.02	1.34	1.18	1.01	0.67	0.34	
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	35.6	22.8	13.2	9.4	6.8	3.3	1.4	
Test Temperature	21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200									
Specific Gravity	2.65																								
						Sieve Analysis Portion						Hydrometer Analysis Portion													
					Sieve	Weight of	Total		Percent	Percent	Time	Hydro	Comp	Percent	"L"	D	K	a							
					5"	10.14	0.00		0.00	100.00															
					3"	10.14	0.00		0.00	100.00															
					2"	10.14	0.00		0.00	100.00															
Wet Wt & Tare	38.79				1.5"	10.14	0.00		0.00	100.00	1	13.5	8	2.52	14.1	50.16578	0.013367	1.001385							
Dry Wt & Tare	37.58				1	10.14	0.00		0.00	100.00	2	13	8	2.35	14.2	35.5756	0.013367	1.001385							
Wt Moisture	1.21				3/4	10.14	0.00		0.00	100.00	5	12	8	2.02	14.3	22.82978	0.013367	1.001385							
Wt Tare	1.52				1/2	19.42	9.28		1.78	98.22	15	10	8	1.34	14.7	13.21388	0.013367	1.001385							
Dry Soil	36.06				3/8	32	21.88		4.19	95.81	30	9.5	8	1.18	14.7	9.369703	0.013367	1.001385							
Moisture Content	0.03355188				4	136.8	126.86		24.64	75.36	60	9	8	1.01	14.8	6.643771	0.013367	1.001385							
Air Dry Total Sample	529.94				10	299.98	289.84		55.51	44.49	250	8	8	0.67	15.0	3.272715	0.013367	1.001385							
Oven Dry Total Samp	522.1449838				20	384.69	64.71	21.72	77.23	22.77	1440	7.5	6.5	0.34	15.1	1.387354	0.013367	1.001385							
Air Dry Hydro Sample	137				40	400.38	100.40	33.70	89.21	10.79															
Oven Dry Wt Hydro	132.5521867				60	415.41	115.43	38.74	94.25	5.75															
Amount Plus #10	289.84				100	421.73	121.75	40.86	96.37	3.63															
W (14.2) =	297.9336112				200	424.91	124.93	41.93	97.44	2.56															

11-27-01 MW

Sample Number	TD03SD		100.00	100.00	100.00	100.00	100.00	100.00	98.89	93.47	74.48	44.88	17.09	5.88	2.70	1.73	1.32	1.27	0.95	0.95	0.79	0.63	0.32	0.16
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	38.2	23.0	13.3	9.4	6.7	3.3	1.4
Test Temperature		21.5 5°		3"		2"		1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200					
Specific Gravity		2.65																						

Wet Wt & Tare	43.57
Dry Wt & Tare	42.48
Wt Moisture	1.09
Wt Tare	1.51
Dry Soil	40.97
Moisture Content	0.026604833
Air Dry Total Sample	512.9
Oven Dry Total Samp	506.878648
Air Dry Hydro Sample	145
Oven Dry Wt Hydro	141.2422729
Amount Plus #10	280.53
W (14.2) =	316.2943451

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10.21	0.00		0.00	100.00
3	10.21	0.00		0.00	100.00
2	10.21	0.00		0.00	100.00
1.5	10.21	0.00		0.00	100.00
1	10.21	0.00		0.00	100.00
3/4	10.21	0.00		0.00	100.00
1/2	16.86	6.65		1.31	98.69
3/8	43.3	33.09		6.53	93.47
4	139.58	129.37		25.52	74.48
10	290.74	280.53		55.34	44.66
20	377.82	87.18	27.56	82.91	17.09
40	413.37	122.83	38.77	94.12	5.88
60	423.43	132.89	41.95	97.30	2.70
100	428.52	135.78	42.93	98.27	1.73
200	427.81	137.07	43.34	98.68	1.32

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	10.5	8	1.42	14.6	51.03387	0.013367	1.001385
2	10	8	1.27	14.7	36.18789	0.013367	1.001385
5	9	8	0.95	14.8	23.0147	0.013367	1.001385
15	9	8	0.95	14.8	13.28754	0.013367	1.001385
30	8.5	8	0.79	14.9	9.421649	0.013367	1.001385
60	8	8	0.63	15.0	6.680401	0.013367	1.001385
250	7	8	0.32	15.2	3.290562	0.013367	1.001385
1440	7	8.5	0.16	15.2	1.371067	0.013367	1.001385

MW 10-24-11

Sample Number	WC046D		100.00	100.00	100.00	100.00	100.00	100.00	100.00	94.61	78.51	58.38	41.70	29.34	20.29	13.73	8.55	5.80	4.56	3.73	3.32	1.87	1.24	0.21
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	34.1	22.0	12.8	9.1	8.8	3.3	1.4
Test Temperature		21.5 5"		3"		2"		1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200					
Specific Gravity		2.65																						

Wet Wt & Tare	39.25
Dry Wt & Tare	38.65
Wt Moisture	0.6
Wt Tare	1.53
Dry Soil	37.12
Moisture Content	0
Air Dry Total Sample	342.02
Oven Dry Total Samp	342.02
Air Dry Hydro Sample	141.05
Oven Dry Wt Hydro	141.05
Amount Plus #10	142.36
W (14.2) =	241.8203596

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10.24	0.00		0.00	100.00
3	10.24	0.00		0.00	100.00
2	10.24	0.00		0.00	100.00
1.5	10.24	0.00		0.00	100.00
1	10.24	0.00		0.00	100.00
3/4	10.24	0.00		0.00	100.00
1/2	10.24	0.00		0.00	100.00
3/8	28.66	18.42		5.39	94.61
4	90.59	80.35		23.49	76.51
10	152.8	142.38		41.62	58.38
20	192.9	40.30	16.68	58.30	41.70
40	222.76	70.16	29.04	70.66	29.34
60	244.62	92.02	38.08	79.71	20.29
100	260.48	107.88	44.65	86.27	13.73
200	272.98	120.38	49.82	91.45	8.55

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	23	6	7.05	12.5	47.31184	0.013367	1.001385
2	20	6	5.80	13.0	34.1047	0.013367	1.001385
5	17	6	4.56	13.5	21.97322	0.013367	1.001385
15	15	6	3.73	13.8	12.83921	0.013367	1.001385
30	14	6	3.32	14.0	9.132293	0.013367	1.001385
60	10.5	6	1.87	14.6	6.588445	0.013367	1.001385
250	9	6	1.24	14.8	3.25477	0.013367	1.001385
1440	7	6.5	0.21	15.2	1.371067	0.013367	1.001385

MW 10-24-11

Sample Number	WC01SD		100.00	100.00	100.00	100.00	100.00	100.00	98.04	92.77	83.62	70.93	60.95	48.77	35.75	23.61	12.07	7.91	5.75	5.39	5.03	4.31	2.52	1.44
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	34.7	22.4	13.0	9.2	6.5	3.2	1.4
Test Temperature		21.5 5"		3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity		2.65																						

Wet Wt & Tare	35.14
Dry Wt & Tare	34.72
Wt Moisture	0.42
Wt Tare	1.5
Dry Soil	33.22
Moisture Content	0.012642986
Air Dry Total Sample	191.64
Oven Dry Total Samp	189.9367776
Air Dry Hydro Sample	100.01
Oven Dry Wt Hydro	98.76136147
Amount Plus #10	55.22
W (14.2) =	139.2433451

Sieve Analysis Portion						Hydrometer Analysis Portion							
Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing	Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
5"	10.39	0.00		0.00	100.00								
3"	10.39	0.00		0.00	100.00								
2"	10.39	0.00		0.00	100.00								
1.5"	10.39	0.00		0.00	100.00	1	20.5	6.0	10.43	12.9	48.0793	0.013367	1.001385
1	10.39	0.00		0.00	100.00	2	17	6.0	7.91	13.5	34.74271	0.013367	1.001385
3/4	10.39	0.00		0.00	100.00	5	14	6.0	5.75	14.0	22.36948	0.013367	1.001385
1/2	14.12	3.73		1.96	98.04	15	13.5	6.0	5.39	14.1	12.95275	0.013367	1.001385
3/8	24.13	13.74		7.23	92.77	30	13	6.0	5.03	14.2	9.185581	0.013367	1.001385
4	41.51	31.12		16.38	83.62	60	12	6.0	4.31	14.3	6.53265	0.013367	1.001385
10	65.61	55.22		29.07	70.93	250	9.5	6.0	2.52	14.7	3.24576	0.013367	1.001385
20	79.5	13.89	9.98	39.05	60.95	1440	8	6.0	1.44	15.0	1.363631	0.013367	1.001385
40	96.46	30.85	22.16	51.23	48.77								
60	114.59	48.98	35.18	64.25	35.75								
100	131.49	65.88	47.31	76.39	23.61								
200	147.56	81.95	58.85	87.93	12.07								

11-22-01 MW

Sample Number	WC01SD		100.00	100.00	100.00	100.00	100.00	100.00	97.40	96.24	83.55	70.73	59.98	47.19	34.26	22.71	12.00	8.58	6.44	5.72	5.37	3.22	2.50	1.43
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	34.5	22.2	12.9	9.2	6.6	3.2	1.4
Test Temperature		21.5 5"	3"	2"		1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity		2.65																						

Wet Wt & Tare	36.51
Dry Wt & Tare	36.06
Wt Moisture	0.45
Wt Tare	1.5
Dry Soil	34.56
Moisture Content	0.013020833
Air Dry Total Sample	201.26
Oven Dry Total Samp	199.4234961
Air Dry Hydro Sample	100.29
Oven Dry Wt Hydro	99.00092545
Amount Plus #10	58.38
W (14.2) =	139.9788804

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.37	0.00		0.00	100.00
3"	10.37	0.00		0.00	100.00
2"	10.37	0.00		0.00	100.00
1.5"	10.37	0.00		0.00	100.00
1	10.37	0.00		0.00	100.00
3/4	10.37	0.00		0.00	100.00
1/2	15.55	5.18		2.60	97.40
3/8	17.86	7.49		3.76	96.24
4	43.17	32.80		16.45	83.55
10	68.75	58.38		29.27	70.73
20	83.79	15.04	10.74	40.02	59.98
40	101.7	32.95	23.54	52.81	47.19
60	119.79	51.04	36.46	65.74	34.26
100	135.96	67.21	48.01	77.29	22.71
200	150.95	82.20	58.72	88.00	12.00

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	20	6	10.02	13.0	48.23133	0.013367	1.001385
2	18	6	8.58	13.3	34.53106	0.013367	1.001385
5	15	6	6.44	13.8	22.23816	0.013367	1.001385
15	14	6	5.72	14.0	12.91501	0.013367	1.001385
30	13.5	6	5.37	14.1	9.158976	0.013367	1.001385
60	10.5	6	3.22	14.6	6.588445	0.013367	1.001385
250	9.5	6	2.50	14.7	3.24576	0.013367	1.001385
1440	8	6	1.43	15.0	1.363631	0.013367	1.001385

Sample Number	WC01SD		100 00	100 00	100.00	100 00	100 00	100 00	90 18	83.33	70.31	60.31	52.00	41 55	30 35	20 01	10 44	7 32	5 80	4 88	4 27	3 66	1 83	0 92
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	34 5	22.2	12.9	9 2	6 5	3.3	1 4
Test Temperature		21 5 5"	3"		2"		1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200						
Specific Gravity		2.65																						

Wet Wt & Tare	23 69
Dry Wt & Tare	23 42
Wt Moisture	0.27
Wt Tare	1.51
Dry Soil	21 91
Moisture Content	0.01232314
Air Dry Total Sample	205.93
Oven Dry Total Samp	204 4107935
Air Dry Hydro Semple	100 16
Oven Dry Wt Hydro	98.9407394
Amount Plus #10	81 13
W (14 2) =	164.052765

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10 49	0.00		0 00	100 00
3"	10 49	0.00		0 00	100 00
2"	10 49	0.00		0 00	100 00
1 1/2"	10 49	0 00		0 00	100 00
1	10.49	0 00		0 00	100.00
3/4	10 49	0 00		0 00	100 00
1/2	30 57	20.08		9 82	90 18
3/8	44 57	34 08		16 67	83 33
4	71 17	60 68		29 69	70 31
10	91 62	81 13		39 69	60 31
20	105.26	13 64	8 31	48 00	52 00
40	122.4	30 78	18 76	58 45	41 55
60	140.77	49 15	29.96	69 65	30 35
100	157 73	66 11	40.30	79 99	20 01
200	173.43	81 81	49.87	89.56	10.44

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	20	6	8.55	13 0	48 23133	0.013367	1 001385
2	18	6	7 32	13 3	34 53135	0 013367	1 001385
5	15.5	6	5 80	13 6	22 17222	0 013367	1 001385
15	14	6	4 88	14 0	12.91601	0 013367	1 001385
30	13	6	4 27	14 2	9 185581	0.013367	1 001385
60	12	6	3.66	14 3	6.53265	0 013367	1 001385
250	9	6	1 83	14 8	3.25477	0 013367	1 001385
1440	7 5	6	0.92	15 1	1 367354	0 013367	1 001385

Sample Number	DM01SD		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.98	97.70	68.86	21.67	6.84	3.66	3.44	3.01	3.01	3.01	1.72	1.29	0.86
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	36.2	23.0	13.3	9.4	6.7	3.3	1.4
Test Temperature		21.5 5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200								
Specific Gravity		2.65																						

Wet Wt & Tare	77.45
Dry Wt & Tare	77.11
Wt Moisture	0.34
Wt Tare	1.52
Dry Soil	75.59
Moisture Content	0.004497949
Air Dry Total Sample	291.41
Oven Dry Total Samp	290.1054353
Air Dry Hydro Sample	117
Oven Dry Wt Hydro	116.4760964
Amount Plus #10	0.07
W (14.2) =	116.5042079

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.26	0.00		0.00	100.00
3"	10.26	0.00		0.00	100.00
2"	10.26	0.00		0.00	100.00
1.5"	10.26	0.00		0.00	100.00
1	10.26	0.00		0.00	100.00
3/4	10.26	0.00		0.00	100.00
1/2	10.26	0.00		0.00	100.00
3/8	10.26	0.00		0.00	100.00
4	10.26	0.00		0.00	100.00
10	10.33	0.07		0.02	99.98
20	12.98	2.65	2.27	2.30	97.70
40	46.58	36.25	31.11	31.14	68.86
60	101.56	91.23	78.31	78.33	21.67
100	118.84	108.51	93.14	93.16	6.84
200	122.54	112.21	96.31	96.34	3.66

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	10	6	3.44	14.7	51.17713	0.013367	1.001385
2	10	6	3.44	14.7	36.18769	0.013367	1.001385
5	9.5	6	3.01	14.7	22.95099	0.013367	1.001385
15	9.5	6	3.01	14.7	13.25075	0.013367	1.001385
30	9.5	6	3.01	14.7	9.369703	0.013367	1.001385
60	8	6	1.72	15.0	6.690401	0.013367	1.001385
250	7.5	6	1.29	15.1	3.281851	0.013367	1.001385
1440	7	6	0.86	15.2	1.371067	0.013367	1.001385

11-27-01 MW

Sample Number	DM02SD		100.00	100.00	100.00	100.00	100.00	100.00	97.37	91.35	71.55	36.70	15.27	5.52	2.48	1.75	1.51	1.37	1.22	1.22	1.22	1.22	0.30	0.30
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	36.1	22.9	13.2	9.3	6.6	3.3	1.4
Test Temperature		21.5 5"		3"		2"		1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200					
Specific Gravity		2.65																						

Wet Wt & Tare	51.98
Dry Wt & Tare	51.7
Wt Moisture	0.28
Wt Tare	1.52
Dry Soil	50.18
Moisture Content	0.005579912
Air Dry Total Sample	479.33
Oven Dry Total Samp	478.3503329
Air Dry Hydro Sample	121.5
Oven Dry Wt Hydro	120.8258026
Amount Plus #10	302.78
W (14.2) =	329.196066

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.19	0.00		0.00	100.00
3"	10.19	0.00		0.00	100.00
2"	10.19	0.00		0.00	100.00
1.5"	10.19	0.00		0.00	100.00
1	10.19	0.00		0.00	100.00
3/4	10.19	0.00		0.00	100.00
1/2	22.77	12.58		2.63	97.37
3/8	51.59	41.40		8.65	91.35
4	146.3	136.11		28.45	71.55
10	312.97	302.78		63.30	36.70
20	383.52	70.55	21.43	84.73	15.27
40	415.61	102.64	31.18	94.48	5.52
60	425.62	112.65	34.22	97.52	2.48
100	428.02	115.05	34.95	98.25	1.75
200	428.83	115.86	35.19	98.49	1.51

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	10.5	6	1.37	14.8	51.03387	0.013367	1.001385
2	10.5	6	1.37	14.6	36.0864	0.013367	1.001385
5	10	6	1.22	14.7	22.88711	0.013367	1.001385
15	10	6	1.22	14.7	13.21388	0.013367	1.001385
30	10	6	1.22	14.7	9.343622	0.013367	1.001385
60	10	6	1.22	14.7	6.606939	0.013367	1.001385
250	7	6	0.30	15.2	3.290562	0.013367	1.001385
1440	7	6	0.30	15.2	1.371067	0.013367	1.001385

MW 14-27H

Sample Number	DM03SD		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.91	90.18	52.27	21.48	7.30	4.41	3.63	3.72	3.72	3.35	2.97	1.49	0.74	0.37
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	36.0	22.8	13.2	9.3	6.7	3.3	1.4
Test Temperature		21.5 5"		3"		2"		1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200					
Specific Gravity		2.65																						

Wet Wt & Tare	72.47
Dry Wt & Tare	72.29
Wt Moisture	0.18
Wt Tare	1.52
Dry Soil	70.77
Moisture Content	0.002543451
Air Dry Total Sample	407.07
Oven Dry Total Samp	406.1384144
Air Dry Hydro Sample	121.75
Oven Dry Wt Hydro	121.4411205
Amount Plus #10	39.87
W (14.2) =	134.6605445

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.47	0.00		0.00	100.00
3"	10.47	0.00		0.00	100.00
2"	10.47	0.00		0.00	100.00
1.5"	10.47	0.00		0.00	100.00
1	10.47	0.00		0.00	100.00
3/4	10.47	0.00		0.00	100.00
1/2	10.47	0.00		0.00	100.00
3/8	10.47	0.00		0.00	100.00
4	10.83	0.36		0.09	99.91
10	50.34	39.87		9.82	90.18
20	101.39	51.05	37.91	47.73	52.27
40	142.85	92.51	68.70	78.52	21.48
60	161.95	111.61	82.88	92.70	7.30
100	165.84	115.50	85.77	95.59	4.41
200	166.62	116.28	86.35	96.17	3.83

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	11	6	3.72	14.5	50.89022	0.013367	1.001385
2	11	6	3.72	14.5	35.98492	0.013367	1.001385
5	11	6	3.72	14.5	22.7588	0.013367	1.001385
15	10.5	6	3.35	14.6	13.17689	0.013367	1.001385
30	10	6	2.97	14.7	9.343622	0.013367	1.001385
60	8	6	1.49	15.0	6.680401	0.013367	1.001385
250	7	6	0.74	15.2	3.290562	0.013367	1.001385
1440	6.5	6	0.37	15.2	1.374771	0.013367	1.001385

11-2701 MW2

Sample Number	DM04SD	100.00	100.00	100.00	100.00	100.00	100.00	99.38	97.31	93.55	74.01	52.64	29.28	12.54	5.43	2.90	2.81	2.50	2.50	1.25	1.25	0.62	0.62
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	36.1	22.9	13.2	9.4	6.7	3.3	1.4
Test Temperature	21.5 5"		3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

Wet Wt & Tare	74.5
Dry Wt & Tare	74.29
Wt Moisture	0.21
Wt Tare	1.52
Dry Soil	72.77
Moisture Content	0.002885805
Air Dry Total Sample	397.61
Oven Dry Total Samp	396.962202
Air Dry Hydro Sample	119
Oven Dry Wt Hydro	118.6575774
Amount Plus #10	103.18
W (14.2) =	160.3316093

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10.19	0.00		0.00	100.00
3	10.19	0.00		0.00	100.00
2	10.19	0.00		0.00	100.00
1.5	10.19	0.00		0.00	100.00
1	10.19	0.00		0.00	100.00
3/4	10.19	0.00		0.00	100.00
1/2	12.67	2.48		0.62	99.38
3/8	20.87	10.68		2.69	97.31
4	35.8	25.61		6.45	93.55
10	113.37	103.18		25.99	74.01
20	147.63	34.26	21.37	47.36	52.64
40	185.08	71.71	44.73	70.72	29.28
60	211.93	98.56	61.47	87.46	12.54
100	223.32	109.95	68.58	94.57	5.43
200	227.38	114.01	71.11	97.10	2.90

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	11	6	3.12	14.5	50.69022	0.013367	1.001385
2	10.5	8	2.81	14.6	36.0864	0.013367	1.001385
5	10	8	2.50	14.7	22.88711	0.013367	1.001385
15	10	6	2.50	14.7	13.21388	0.013367	1.001385
30	8	6	1.25	15.0	9.447514	0.013367	1.001385
60	8	6	1.25	15.0	6.680401	0.013367	1.001385
250	7	6	0.62	15.2	3.290562	0.013367	1.001385
1440	7	6	0.62	15.2	1.371067	0.013367	1.001385

MW 12-27-11

Sample Number.	WC02SD		100.00	100.00	100.00	100.00	100.00	100.00	100.00	92.49	86.07	74.66	63.63	51.86	38.42	26.02	14.10	9.83	7.87	6.39	5.41	3.93	2.95	0.98
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	35.0	22.4	13.0	9.3	6.6	3.3	1.4
Test Temperature		21.5	5"	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	80	100	200							
Specific Gravity		2.65																						

Wet Wt & Tare	51.27
Dry Wt & Tare	50.59
Wt Moisture	0.68
Wt Tare	1.5
Dry Soil	49.09
Moisture Content	0.013852108
Air Dry Total Sample	215.23
Oven Dry Total Samp	213.0270022
Air Dry Hydro Sample	77.08
Oven Dry Wt Hydro	76.02686759
Amount Plus #10	53.99
W (14.2) =	101.8365252

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10.5	0.00		0.00	100.00
3	10.5	0.00		0.00	100.00
2	10.5	0.00		0.00	100.00
1.5	10.5	0.00		0.00	100.00
1	10.6	0.00		0.00	100.00
3/4	10.5	0.00		0.00	100.00
1/2	10.6	0.00		0.00	100.00
3/8	26.49	15.99		7.51	92.49
4	40.17	29.67		13.93	86.07
10	64.49	53.99		25.34	74.66
20	75.72	11.23	11.03	36.37	63.63
40	87.7	23.21	22.79	48.14	51.86
60	101.39	36.90	36.23	61.58	38.42
100	114.02	49.53	48.64	73.98	26.02
200	126.16	61.67	60.56	85.90	14.10

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	17	6	10.82	13.5	49.13361	0.013367	1.001385
2	18	6	9.83	13.7	34.9528	0.013367	1.001385
5	14	6	7.87	14.0	22.36946	0.013367	1.001385
15	12.5	6	6.39	14.2	13.02789	0.013367	1.001385
30	11.5	6	5.41	14.4	9.284939	0.013367	1.001385
60	10	6	3.93	14.7	6.606939	0.013367	1.001385
250	9	6	2.95	14.8	3.25477	0.013367	1.001385
1440	7	6	0.98	15.2	1.371067	0.013367	1.001385

Sample Number	WC03SD
Test Temperature	21.5 C
Specific Gravity	2.65

Wet Wt & Tare	49.32
Dry Wt & Tare	48.55
Wt Moisture	0.77
Wt Tare	1.49
Dry Soil	47.06
Moisture Content	0.016362091
Air Dry Total Sample	286.98
Oven Dry Total Samp	284.2876563
Air Dry Hydro Sample	100.17
Oven Dry Wt Hydro	98.55739494
Amount Plus #10	119.74
W (14.2) =	170.2768149

100.00	100.00	100.00	100.00	100.00	100.00	93.57	88.38	74.20	57.88	43.54	32.82	24.06	16.50	9.63	6.76	5.00	4.12	3.53	2.94	1.47	0.59
125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	34.6	22.3	13.0	9.2	6.6	3.3	1.4
	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10.18	0.00		0.00	100.00
3	10.18	0.00		0.00	100.00
2	10.18	0.00		0.00	100.00
1.5	10.18	0.00		0.00	100.00
1	10.18	0.00		0.00	100.00
3/4	10.18	0.00		0.00	100.00
1/2	28.45	18.27		6.43	93.57
3/8	43.22	33.04		11.62	88.38
4	80.54	73.36		25.80	74.20
10	129.92	119.74		42.12	57.88
20	154.34	24.42	14.34	56.46	43.54
40	172.59	42.67	25.06	67.18	32.82
60	187.51	57.59	33.82	75.94	24.06
100	200.38	70.46	41.38	83.50	16.50
200	212.08	82.16	48.25	90.37	9.63

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	21	6	8.82	12.9	47.92679	0.013367	1.001385
2	17.5	6	6.76	13.4	34.63719	0.013367	1.001385
5	14.5	6	5.00	13.9	22.30391	0.013367	1.001385
15	13	6	4.12	14.2	12.99037	0.013367	1.001385
30	12	6	3.53	14.3	9.238562	0.013367	1.001385
60	11	6	2.94	14.5	6.569899	0.013367	1.001385
250	8.5	6	1.47	14.9	3.263755	0.013367	1.001385
1440	7	6	0.59	15.2	1.371067	0.013367	1.001385

CMW 10-24-11

D Global Positioning System Coordinates

This page intentionally left blank.

Global Positioning System Sample Coordinates

Sample Station	Matrix	Latitude	Longitude	Accuracy	Comments
SP01SS	Slag	42° 45' 16.6" North	-116° 55' 22.3" West		Sample coordinates estimated from GoogleEarth™
SP02SS	Slag	42° 45' 17.2" North	-116° 55' 22.3" West		Sample coordinates estimated from GoogleEarth™
SP03SS	Slag	42° 45' 16.7" North	-116° 55' 21.9" West	± 17 feet	
BA01SS	Ash	42° 45' 19.2" North	-116° 55' 21.1" West	± 16 feet	
BK01SS	Surface Soil	42° 45' 19.6" North	-116° 55' 20.8" West	± 16 feet	
WC04SD	Sediment	42° 45' 19.2" North	-116° 55' 22.5" West	± 17 feet	
WC03SD	Sediment	42° 45' 17.4" North	-116° 55' 22.7" West		Sample coordinates estimated from GoogleEarth™
WC02SD	Sediment	42° 45' 16.5" North	-116° 55' 22.7" West	± 18 feet	
WC01SD	Sediment	42° 45' 15.6" North	-116° 55' 22.2" West	± 19 feet	
CC01SS	Surface Soil	43° 02' 15.4" North	-116° 46' 58.2" West	± 16 feet	
CC02SS	Surface Soil	43° 02' 15.3" North	-116° 46' 58.1" West	± 15 feet	
CC03SS	Surface Soil	43° 02' 14.7" North	-116° 46' 57.9" West	± 15 feet	
BK02SS	Surface Soil	43° 02' 15.1" North	-116° 46' 57.5" West	± 14 feet	
CC03SD	Sediment	43° 02' 13.3" North	-116° 46' 56.6" West	± 19 feet	
CC02SD	Sediment	43° 02' 14.6" North	-116° 46' 57.7" West	± 20 feet	
CC01SD	Sediment	43° 02' 15.8" North	-116° 46' 58.6" West	± 19 feet	
PT03SD	Sediment	43° 00' 54.4" North	-116° 44' 02.4" West	± 17 feet	
PT02SD	Sediment	43° 00' 53.6" North	-116° 44' 02.8" West	± 17 feet	
PT01SD	Sediment	43° 00' 50.0" North	-116° 44' 06.5" West	± 18 feet	
BK03SS	Surface Soil	43° 00' 50.2" North	-116° 44' 04.8" West	± 21 feet	
PT01SS	Surface Soil	43° 00' 50.9" North	-116° 44' 04.8" West	± 22 feet	
PT02SS	Surface Soil	43° 00' 52.7" North	-116° 44' 03.2" West	± 28 feet	
PT03SS	Surface Soil	43° 00' 53.9" North	-116° 44' 01.9" West	± 17 feet	
TD01SD	Sediment	43° 00' 27.1" North	-116° 44' 49.3" West	± 16 feet	
TD02SD	Sediment	43° 00' 32.6" North	-116° 44' 40.3" West	± 17 feet	
TD01SS	Surface Soil	43° 00' 32.7" North	-116° 44' 40.4" West	± 19 feet	
BK04SS	Surface Soil	43° 00' 32.3" North	-116° 44' 39.9" West	± 23 feet	
TD02SS	Surface Soil	43° 00' 32.0" North	-116° 44' 41.5" West	± 22 feet	
TD03SS	Surface Soil	43° 00' 31.6" North	-116° 44' 42.3" West	± 22 feet	
TD03SD	Sediment	43° 00' 40.5" North	-116° 44' 30.5" West		Sample coordinates estimated from GoogleEarth™
JC01SD	Sediment	42° 59' 51.0" North	-116° 43' 37.1" West	± 35 feet	
JC02SD	Sediment	43° 00' 43.7" North	-116° 43' 50.8" West	± 15 feet	
JC03SD	Sediment	43° 00' 55.0" North	-116° 43' 50.1" West	± 15 feet	
JC04SD	Sediment	43° 01' 00.5" North	-116° 43' 54.3" West	± 19 feet	
DW01SR	Domestic Water	43° 00' 58.7" North	-116° 44' 02.2" West	± 25 feet	
DW02SR	Domestic Water	43° 00' 57.6" North	-116° 43' 59.6" West	± 21 feet	
DW03SR	Domestic Water	43° 01' 01.4" North	-116° 43' 57.2" West	± 28 feet	
BK01SR	Spring	43° 01' 06.7" North	-116° 44' 22.1" West	± 28 feet	
DM01SD	Sediment	43° 02' 24.5" North	-116° 46' 00.1" West	± 20 feet	
DM02SD	Sediment	43° 02' 24.2" North	-116° 45' 58.1" West	± 17 feet	
DM03SD	Sediment	43° 02' 21.0" North	-116° 45' 54.2" West	± 22 feet	
DM01SP	Seep	43° 02' 20.2" North	-116° 45' 53.9" West	± 22 feet	
DM02SP	Seep	43° 02' 20.2" North	-116° 45' 53.9" West	± 22 feet	
DM04SD	Sediment	43° 02' 20.1" North	-116° 45' 41.8" West	± 20 feet	

This page intentionally left blank.