

MADRE d'ORO MINE

(aka patented: Madre d'Oro MS, White Fir Fraction MS, White Fir MS
aka unpatented: Mineral Zone #6, #7, #8, #10; Rare Group No. 2, Rare
Group No. 3, Noisy Rock Placer)

PRELIMINARY ASSESSMENT AND SITE INSPECTION REPORT

Idaho County
State of Idaho



Department of Environmental Quality

March 2012

Submitted to:
U. S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

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STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hillon • Boise, Idaho 83706 • (208) 373-0502

C.L. "Butch" Otter, Governor
Curt Fransen, Director

March 28, 2012

Mr. Ken Marcy
U.S. Environmental Protection Agency
12928 SW 276th Street
Vashon, WA 98070

RE: Preliminary Assessment and Site Inspection Report for the Madre d'Oro Mine,
Idaho County, Idaho

Dear Mr. Marcy:

The Madre d'Oro Mine site is comprised of three patented claims: Madre d'Oro MS, White Fir Fraction MS, and White Fir MS. There are seven unpatented claims on the U.S. Bureau of Land Management (BLM) ground associated with this area as well: Rare Find Group No. 2, Rare Find Group No. 3, Mineral Zone #6, Mineral Zone #7, Mineral Zone #8, Mineral Zone #10, and Noisy Rock Placer.

The Idaho Department of Environmental Quality (DEQ) requested access to the private property, but permission was not received from the landowners. Since this area contains mixed ownership lands (private, BLM, and U.S. Forest Service), DEQ utilized the BLM property which surrounds the Madre d'Oro claims to perform the assessment. Samples were collected from public land, no samples were collected from the adit or the waste dump which was presumed to be on private property.

One of the landowners, Mr. Orrin Saunders, will receive a copy of this report as he was our main point of contact. There are multiple owners on these parcels and DEQ made attempts to send letters which were returned without a forwarding address. Mr. Saunders would not give permission until the other owners were contacted. DEQ staff was conducting preliminary assessments in the area and did not find property line markers. There is evidence of recreation at the old mill site. This area appeared to be on BLM land.

Attached are two copies DEQ's Preliminary Assessment and Site Inspection Report for the Madre d'Oro Mine.

Generally speaking, toxicological risks to human and ecological receptors are unlikely at the Madre d'Oro Mine. This is due to the lack of residences or structures, no site workers present and limited use of this area by the public.

The air, soil, and water pathways are not complete. All historic mine and mill site related disturbances are well vegetated and stable. Although no evidence existed of any recent disturbances or activity, the mine site is accessible. No established recreational trails or paths were present. The laboratory results from the soil, sediment, and water samples were not remarkable for a mineralized area.

The BLM soil risk benchmarks indicated background soil sample QCBGSS1 exceeded the copper concentration for the robin by 4.4 times. No evidence of livestock or grazing was observed.

The Madre d'Oro Mine is not located within the source water delineation zone. No drinking water sources, wells, or ground water sources exist on the Madre d'Oro Mine site.

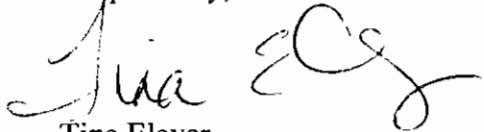
Based on existing conditions and uses, historic information, sampling data, observations made during the site visit, analysis of the mine wastes, potential pathway of contaminants to receptors and potential exposures to ecological and human receptors, **DEQ recommends the determination of the Madre d'Oro Mine and associated claims as No Remedial Action Planned (NRAP).**

A link to the Preliminary Assessment and Site Inspection Report for the Madre d'Oro Mine can also be found on DEQ's Mining Preliminary Assessment Web page at:

<http://www.deq.idaho.gov/waste-mgmt-remediation/remediation-activities/mining-preliminary-assessments.aspx>

If you have any questions about these sites, the report, or DEQ's recommendations, please do not hesitate to call me at (208) 373-0563.

Respectfully,



Tina Elayer
Mine Waste Specialist

attachments

cc: Mr. Orrin Saunders
Mr. Scott Sanner, BLM
Madre d'Oro Mine PA File

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List of Acronyms

amsl	Above mean sea level
ATV	All-Terrain Vehicle
BLM	U.S. Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
ESU	Ecologically Significant Unit
GIS	Geographic Information System
HHSLs	Human Health Medium-Specific Screening Levels
HRS	Hazard Ranking Score
IDFG	Idaho Department of Fish and Game
IDTLs	Initial Default Target Levels
MCL	Maximum Contaminant Level
NAIP	National Agriculture Imagery Program
NRAP	No Remedial Action Planned
PA	Preliminary Assessment
PPE	Probable Point of Entry
ppm, mg/kg, mg/L	parts per million, milligrams per kilograms, milligrams per Liter
PWS	Public Water System
RMP	Risk Management Plan
SI	Site Inspection

SVL	Silver Valley Laboratories, Inc.
TDL	Target Distance Limit
TMDL	Total Maximum Daily Load
TOT	Time of Travel
USFS	U.S. Forest Service
USGS	U.S. Geological Survey

Section 1. Introduction

This report presents the results of the Preliminary Assessment and Site Inspection (PA/SI) for the Madre d'Oro Mine, mill site, and claims hereafter referred to as the Madre d'Oro Mine. This mine and mill site is located within the Elk City Mining District. The Idaho Department of Environmental Quality (DEQ) is contracted by Region 10 of the U.S. Environmental Protection Agency (EPA) to provide technical support for completion of preliminary assessments at various mines on private or state lands and/or those areas that have mixed ownership (public and private).

DEQ also completes site assessments to respond to complaints or information about sites possibly contaminated with hazardous waste. These sites include abandoned mines, rural airfields that have served as bases for aerial spraying, old landfills, illegal dumps, and abandoned industrial facilities with known or suspected releases.

In February 2002, DEQ initiated a Preliminary Assessment Program to evaluate and prioritize assessment of such potentially contaminated sites. Due to accessibility and funding considerations, priority is given to sites where potential contamination poses the most substantial threat to human health or the environment. In recent years this priority focuses DEQ's efforts in areas where residential and recreational developments are encroaching on historic mining districts. Priority is also given to mining districts where groups or clusters of sites like those found at the Madre d'Oro Mine can be cost effectively assessed on a watershed basis.

See the following web page for additional information about DEQ's Preliminary Assessment Program: <http://www.deq.idaho.gov/waste-mgmt-remediation/remediation-activities/mining-preliminary-assessments.aspx>

The Madre d'Oro Mine is located on private property and U.S. Bureau of Land Management (BLM) property (Figure 1). The Madre d'Oro Mine contains one adit and a waste dump. Evidence of an old mill site at the lower end of the claim still remains. On September 8, 2011 DEQ visited the mine and performed a site assessment. This mine is within the much larger mining area of the Elk City Mining District in Idaho County, Idaho.

DEQ was not able to ascertain property boundaries between private and federal land. The area was not fenced and showed signs of use from recreationists.

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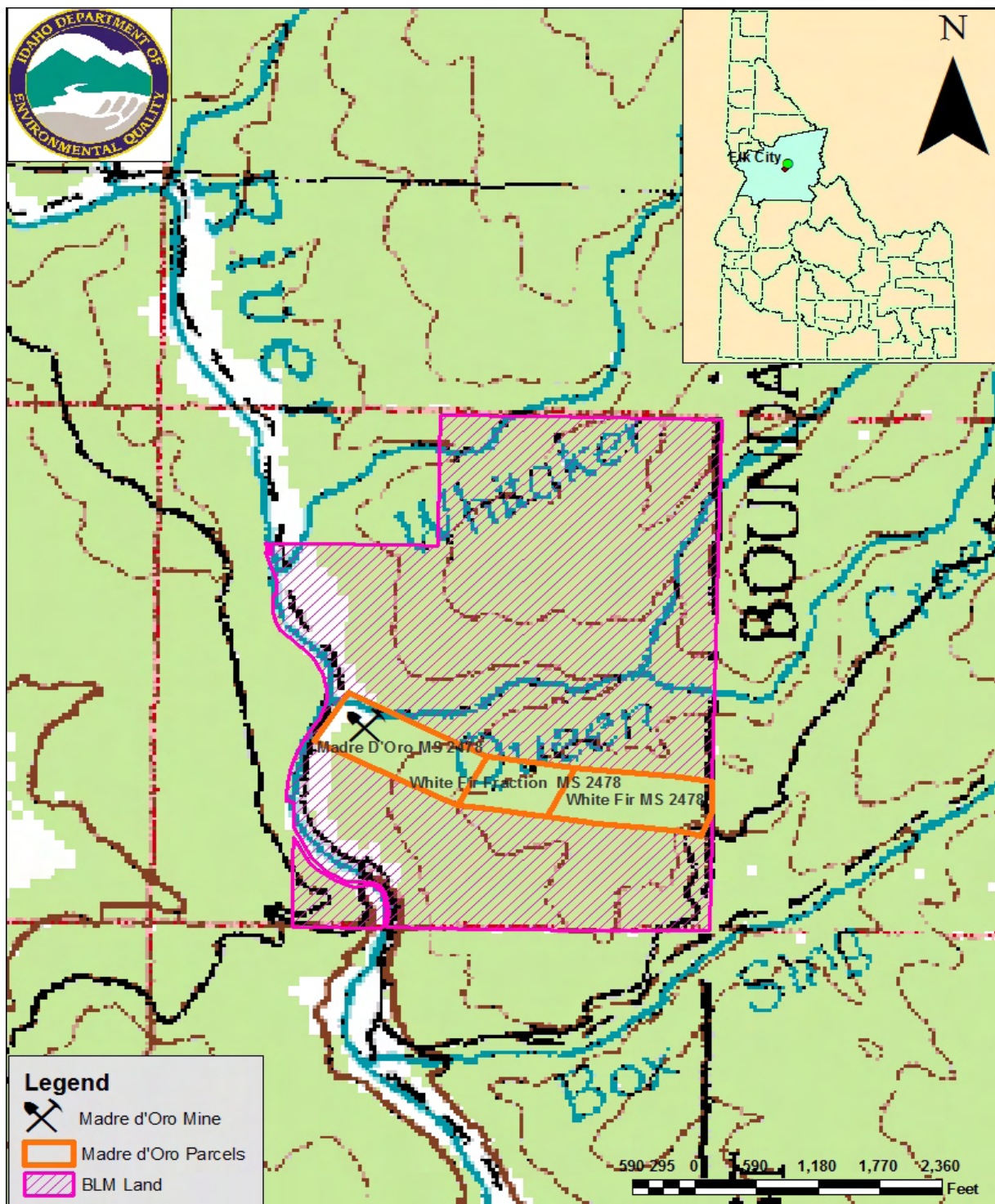


Figure 1. Topographic Overview Map of the Madre d'Oro Mine
Parcel data from Idaho County Assessor's Office. (Map Source: USGS 100k Quads)

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Section 2. Ownership

DEQ does not warrant the ownership research or location of property boundaries contained in this report. The information regarding ownership and property boundaries was obtained from the Idaho County Assessor's Office and the BLM General Land Office (GLO) Records. This area has a mixture of federal, private, private industrial, and State of Idaho ownership.

The Madre d'Oro Mine site is comprised of three patented claims; Madre d'Oro MS, White Fir Fraction MS, and White Fir MS. There are seven unpatented claims associated with this area as well: Rare Find Group No. 2, Rare Find Group No. 3, Mineral Zone #6, Mineral Zone #7, Mineral Zone #8, Mineral Zone #10, and Noisy Rock Placer. DEQ requested access to the property, but permission was not received from the private landowners. The privately held claims are surrounded by BLM property. **Because ownership was uncertain, no samples were collected from the adit or the waste dump.**

During the site assessment, DEQ used references from several different documents including U.S. Geological Survey (USGS) maps, county tax rolls, and historical reports that have spelled numerous claim names, town sites, and/or geographic features differently from one and another. DEQ's use of the different spellings is to remain in context with the reference used for each given section of text or written in this report.

In the following ownership description the "**Partial Determination**" is meant to convey a very brief summary of DEQ's assessment of individual claims and parcels relative to human health and ecological risk factors associated with toxicological responses to mine wastes. A determination of No Remedial Action Planned or "**NRAP**" means based on current conditions at the site, DEQ did not find any significant evidence indicating the potential of adverse toxicological effects to human or ecological receptors on the parcel of land. This determination says nothing about risks associated with physical hazards such as open adits, open shafts, high walls, or unstable ground. The Partial Determination of "**Calculate HRS**" indicates DEQ has determined that there is sufficient evidence of a release of hazardous substances, completed pathways, and likely exposure of sensitive receptors. Therefore, the site conditions warrant calculation of a "**Hazard Ranking Score**" (HRS) by EPA's contractors. This designation also indicates DEQ has made significant conclusions and recommendations that additional site assessments and/or remedial actions are necessary to prevent adverse effects to human or ecological receptors. DEQ did not find any sites requiring The Partial Determination of Calculate HRS at the Madre d'Oro Mine. The conclusions and recommendations for the Madre d'Oro Mine are in Section 11 of this report.

Owner	Claims	Parcel Number	Partial Determination
Orrin Saunders (from County Tax Records)	Madre d'Oro MS	###29N08E13	NRAP
Orrin Saunders (from County Tax Records)	White Fir Fraction MS	###29N08E13	NRAP
Orrin Saunders (from County Tax Records)	White Fir MS	###29N08E13	NRAP
BLM	Unpatented Claims: Mineral Zone #6 Mineral Zone #7 Mineral Zone #8 Mineral Zone #10 Rare Group No. 2 Rare Group No. 3 Noisy Rock Placer	###29N08E24	NRAP

Section 3. Overview and Location

3.1 Location

The Madre d'Oro Mine is located at an elevation of 4170 feet above mean sea level (amsl) on the south side of Queen Creek approximately 500 feet upstream from the confluence of Queen Creek with the American River. The mine is approximately 1.6 air miles from Elk City in Idaho County, Idaho. The mine is in the Section 13 of Township 29 North, Range 8 East of the Boise Meridian at Latitude 45.84917°N and Longitude -115.4125°W.

3.2 Directions to the Mine

To access the Madre d'Oro Mine from Elk City take County Road 443 northeast to the junction with U.S. Forest Service (USFS) Road 1809. Go 0.2 mile on USFS Road 1809 to the American River and the junction with USFS Road 2541, then 0.4 miles north on USFS Road 2541 to the mouth of Queen Creek. A road crosses the American River allowing access along Queen Creek. The road ends at the mine site.

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Section 4. Mine Site History

DEQ utilizes historical research for several purposes. Initially historical information highlights potential contaminants of concerns, the magnitude of waste sites, and potentially dangerous physical hazards such as open adits and shafts. DEQ also uses the information to properly identify mine and mill facilities, unravel inconsistencies that may exist in property boundaries and ownership, and historical land uses that coincide with mining.

The historical information helps DEQ's staff understand the relative levels of production, commodities, potential waste types, etc. necessary to prepare for site assessment field work.

DEQ realizes that many of the mine sites described in the histories are particularly important to both the federal government and State of Idaho. This information documents the relative importance of historic mining districts and workings as they are re-evaluated from the perspectives of economics, multiple land use, human health, and ecological risks.

Numerous sources were used during the "desktop" research prior to visiting the site. Most notably are the articles on the history and geology written by Shenon and Reed (1934), Lorain (1938) and Erdmann et.al. (2003). DEQ could not improve or expound upon these reports by writing additional historical or geological text, therefore they were directly referenced and cited.

Shenon and Reed (1934) reported:

The Madre d' Oro prospect is on the east side of the American River about half a mile east of the Mineral Zone. The three patented claims are owned by S. W. Litchfield. The developments consist of about 1,100 feet of tunnel and some prospect pits. About 800 feet of the tunnel is crosscut. There has been no production.

Lorain (1938) reported:

The Madre d' Oro Mine owned and operated by S.W. Litchfield, is situated on American River 2.7 miles by road north of Elk City at an altitude of approximately 4,100 feet above sea level. The property comprises three patented and four unpatented claims.

The ore occurs in a shear zone 40 to 60 feet wide in a dark-colored hornblende gneiss. The shear zone strikes approximately east and west and dips steeply to the north. The ore is a bluish gouge from a few inches to 4 feet or more wide, which occurs near the middle of the shear zone: this gouge is strongly mineralized with auriferous pyrite and carries some free gold. One stope about 50 feet long has been mined to a height of four sets above the drift; the stope faces showed 4 to 5 feet of ore. It was said that 300 tons of \$23 ore was mined during the current season.

The mine was worked through an adit drift which, at the active stope, was about 150 feet below the surface. The ground, particularly in the ore shoots, was soft; it was easily drilled by hand methods and required square sets for support. The ore slacked quickly upon exposure to the air and consequently required no primary crushing at the mill.

Two 1,000-pound stamps crushed 10 tons of ore per 24 hours: a 30-mesh screen was used. The pulp then passed over a corduroy table consisting of four sections, each 4 feet 6 inches wide and 28 inches long with a 2-inch drop between; the slope was 1 ¾ inches to the foot. Concentrates from the blanket tables were amalgamated in an amalgam barrel; the tailings were stored for retreatment. A 20-percent recovery was made by amalgamation.

It was planned to install a small tube mill for regrinding a ¼ mesh stamp product; this would be followed by a hydraulic classifier gold trap for recovery of free gold and a flotation machine for concentration of the sulphides.

The stamp mill was driven directly from a 7-foot 10-inch-diameter Pelton-type water wheel turning at 35 r.p.m.; this wheel was made from an old gear wheel to which buckets had been bolted. For four months of the year water was brought in a ditch from Queens Creek and delivered under a 190-foot head; a high head of water was also available from Whittaker Creek. To provide for year-round operation, a ditch was under construction that would deliver water from American River, under a 35-foot head, to a 250-horsepower turbine generator plant to be installed about 600 feet from the mill. The mine was equipped with a small sawmill.

Erdmann, et.al. (2003) reported:

In the 1930s, the Madre d' Oro Mine had three patented and four unpatented claims owned by S. W. Litchfield (Shenon and Reed, 1934; Lorain, 1938). Development in the early 1930s consisted of about 1,100 feet of tunnel (Shenon and Reed, 1934). By 1937, a two-stamp mill with blanket tables and an amalgamation barrel was operating at the mine. The stamp mill was being run by water power from Queen Creek, but a ditch was under construction to provide water from the American River for year-around operations (Lorain, 1938).

Section 5. Climatology

As reported in the South Fork Clearwater River Subbasin Assessment and TMDLs (DEQ 2002):

Northern Idaho is dominated by Pacific maritime air masses and prevailing westerly winds. Over 85 percent of the annual precipitation occurs during the fall, winter, and spring months. Cyclonic storms consisting of a series of frontal systems moving east produce long duration, low intensity precipitation during this period of the year. In winter and spring, this inland maritime regime is characterized by prolonged gentle rains, fog, cloudiness, and high humidity; with deep snow accumulations at higher elevations. Winter temperatures are often 15 to 25 °F warmer than the continental locations of the same latitude. The climate during the summer months is influenced by stationary high pressure systems over the northwest coast. This warm dry system results in only 10-15 percent of the annual precipitation falling during the summer.

The nearest climatic data is from Elk City, Idaho which is approximately 1.6 air miles from the mine. The elevation of Elk City at the airport is 4097 feet amsl and the Madre d'Oro Mine is at approximately 4170 feet amsl. Therefore, the two sites have very similar climates. The mean annual temperature is 41.3°F and the mean annual precipitation is 30.2 inches. The number of days with temperatures greater than 90°F per year is 12.2 days.

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Section 6. General Geology

Shenon and Reed (1934) reported:

The country rocks are gneiss and schist, and the tunnel cuts a large hornblendite sill. Some of the schist is silicified and carries disseminated pyrite. An east-west vein that dips 80° N. is followed for a short distance by the shaft.

Loraine (1938) reported:

The ore occurs in a shear zone 40 to 60 feet wide in a dark-colored hornblende gneiss. The shear zone strikes approximately east and west and dips steeply to the north. The ore is a bluish gouge from a few inches to 4 feet or more wide, which occurs near the middle of the shear zone: this gouge is strongly mineralized with auriferous pyrite and carries some free gold.

Erdmann et.al. (2003) reported:

The Madre d' Oro Mine is in the biotite gneiss and schist unit of the Middle or Early Proterozoic Elk City metamorphic sequence (Lewis and others, 1990, 1993) and the adit cuts an amphibolite sill (Lewis and others, 1990, 1993; Lorain, 1938). The vein strikes east-west and dips 80° north (Shenon and Reed, 1934). The ore, consisting of auriferous pyrite and some free gold, was found in the center of a shear zone 40 to 60 feet wide (Lorain, 1938).

Figure 2 is a map of the major lithology in the vicinity of the Madre d'Oro Mine.

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Figure 2. Map of Major Lithology in the Vicinity of the Madre d'Oro Mine

(Map Source: ArcSDE.DEQ.GIS83.DBO.major lithology)

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Section 7. Current and Potential Future Land Uses

More than 100 years ago the beneficial use of lands and waters in the Elk City Mining District was mining, subsistence hunting and fishing, and associated commerce to support the mining operation industry. These uses expanded to include a broader market for timber, fur trapping, recreational hunting and fishing, camping, and all-terrain vehicle (ATV) touring. No evidence of livestock, specifically the cattle or sheep industry, was found at the Madre d'Oro Mine. The possibility remains patented mining ground could be subdivided and sold as recreational properties. At the time of this writing no cabins, homes or structures had been constructed on the site. There was evidence of camping. A fire ring was observed and garbage/debris was scattered throughout the area.

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Section 8. Mine Site Conditions

The Madre d'Oro Mine adit is near the confluence of Queen Creek and American River. The claims are surrounded by BLM property and no residences or recreational dwellings are on the claims. All of the photographs in this section were taken by DEQ on September 8, 2011. The adit is collapsed with water exiting at less than one gallon per minute (gpm) to an area below the adit creating a lush meadow/bog environment. The water has an iron stained, rust color. The bog is well vegetated with no signs of vegetation stress.



Photo 1. Madre d'Oro adit.

The Madre d'Oro Mine waste dump is well vegetated with mature trees (lodgepole, spruce, and grand fir) and grass. The waste dump appears to be very stable. The waste dump extends from the adit to Queen Creek with the toe of the dump now part of the bank of Queen Creek. Although no signs were posted, the waste dump was not sampled as it appeared it could be on private property.



Photo 2. Toe of Madre d'Oro waste dump adjacent to the bog.



Photo 3. Close-up of Madre d'Oro waste dump (part of the bank of Queen Creek) with healthy swath of vegetation in the bog/meadow.

At the lower end of the claim across from Queen Creek evidence of the old 2 stamp mill remains. There is also evidence of an old road running upstream along the creek. The “road” may be the water ditch referenced by Lorain (1938). The road/ditch is overgrown and inaccessible to any kind of motor vehicle traffic or livestock (pack animals).



Photo 4. At the lower end of the claim Queen Creek runs between the remains of the old mill site (2 stamp mill) and the adit.

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Section 9. Sample Collection and Analysis

9.1 Collection

A total of five samples were collected from the Madre d'Oro Mine site.

- Sediment (QCBGSD1) – Background sediment sample (composite)
- Sediment (MOPPESD1) – Probable point of entry sediment soil sample (composite)
- Water (QCBGSW1) – Background surface water sample
- Water (QCPPEW1) – Probable point of entry surface water sample
- Soil (QCBGSS1) – Background soil sample (composite)

Background sediment sample QCBGSD1, probable point of entry sediment sample MOPPESE1, and background soil sample QCBGSS1 were sieved at the sample location, placed in a properly marked zip lock bag, and then placed in a similarly marked cloth bag. The samples were then entered into the Chain-of-Custody form prior to shipping to Silver Valley Laboratories, Inc. (SVL). The portion of the sample that passed through a 9 mesh sieve was sent for laboratory analysis.

After the sample was bagged and tagged, Nitrile gloves and disposable plastic spoons were discarded into a sealable waste bag. The screens used to sieve and collect samples were washed and scrubbed with Alconox and thoroughly rinsed with distilled water and then dried with paper towels. The sieves were then stored in a clean, isolated container for transportation to the next sample location.

Prior to collection of field parameters for water quality analysis, laboratory prepared sample bottles were labeled and triple rinsed by a gloved technician who then filled the bottles as grab samples. The bottles were acidified with 10 ml nitric acid, closed, dried, and placed in a cooler with ice. Background surface water sample QCBGSW1 and PPE surface water sample QCPPEW1 were collected from Queen Creek.

The surface water samples were submitted in accordance with EPA Chain of Custody procedures to SVL in Kellogg, Idaho for analysis of RCRA 8 Suite + copper, iron, manganese, zinc, and antimony. A copy of the laboratory report is included as Appendix A. A summary of the laboratory results is included in the tables in Sections 9.2 and 9.3. Figure 3 illustrates the locations where the samples were collected.

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Figure 3. Sample Locations and Features of the Madre d'Oro Mine

Water/sediment samples were taken from Queen Creek. (Map Source: 2009 Natural Color 1-meter National Agriculture Imagery Program (NAIP) Idaho)

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The Madre d'Oro Mine is located on the south side of Queen Creek. The toe of the waste dump reaches the creek, forming a bank, and is assumed to be part of the creek. Since DEQ did not have permission to access the private property, no samples were collected from the patented claims. All samples were collected from the BLM owned reach of Queen Creek upstream and downstream of the mine and in the adjacent uplands.

Below the mining activity area background surface water sample QCBGSW1 and probable point of entry (PPE) surface water sample QCPPEW1 were collected. The PPE is the point at which any hazardous substance migration intersects with surface water.

Above the mining activity area background sediment sample QCBGSD1 was collected from the bottom of Queen Creek. PPE sediment sample MOPPESD1 was collected near the mouth of Queen Creek. The PPE is the point at which any hazardous substance migration intersects with surface water and would be detected in a stream bottom sediment sample. **Note the labeling inconsistency with sample MOPPESD1. It is sediment from the bottom of Queen Creek at the same location as the water sample.**

Background soil sample QCBGSS1 was collected uphill above the mine property on BLM property and away from any mining related activities.

Photo 6 shows the small pool in Queen Creek near its confluence with the American River below the mining activity area where PPE surface water sample QCPPEW1 and PPE sediment soil sample MOPPESD1 were collected.



Photo 5. Samples MOPPESD1 and QCPPEW1 were collected from this small pool in Queen Creek.

9.2 Soil Sample Analysis

Background sediment sample QCBGSD1, PPE sediment sample MOPPESE1, and background soil sample QCBGSS1 were analyzed at SVL utilizing EPA 6000/7000 method 6010B for all metals except mercury where method 7471A was utilized. Laboratory analytical results have been compared to and will be discussed below relative to Idaho's *Initial Default Target Levels* (IDTLs), EPA Region 6 Human Health Screening Levels (HHSLs) and the BLM Wildlife and Livestock Risk Management Criteria for Metals in Soils (Technical Note 390 Rev. 2004).

The IDTLs are risk-based target levels for certain chemicals that have been developed by DEQ using conservative input parameters, a target acceptable risk of 10^{-5} , and a *Hazard Quotient* of 1. These numbers, although used for comparison even at remote locations, are more applicable to sites where "unrestricted uses" such as residential development are expected. Similarly, the EPA Region 6 HHSLs are human health based risk derived for screening where residents are at risk for exposure.

PPE sediment sample MOPPESD1 was taken from the stream bed substrate of Queen Creek near its confluence with the American River below the mining activity area. This sample exceeds the IDTLs for mercury by 8.4 times.

Background sediment sample QCBGSD1 was taken from the stream bed substrate of Queen Creek above the mining activity area and exceeded the IDTLs for mercury by 35.3 times.

Background soil sample QCBGSS1, taken well up hill and above the mining activity area, exceeded the IDTLs for chromium by 4.4 times, manganese by 2.2 times, selenium by 2.1 times, and mercury by 24.5 times.

The background sediment and soil samples exceeded the PPE sample for all metals concentrations. These concentrations are not unusual for a mineralized location such as the Madre d'Oro Mine and associated claims. These concentrations are not remarkable.

Table 1 summarizes the laboratory analytical results for the sediment and soil samples collected.

Table 1. Madre d'Oro Mine Sediment and Soil Sample Analysis

Metals	IDTLs (mg/kg)	HHSLs (mg/kg)	Sediment Sample MOPPESD1 (mg/kg)	Background Sediment Sample QCBGSD1 (mg/kg)	Background Soil Sample QCBGSS1 (mg/kg)
Antimony	4.77	31	<2.0	<2.0	<2.0
Arsenic	0.391	23	<2.5	<2.5	<2.5
Barium	896	1,600	40.5	43.8	200
Cadmium	1.35	39	<0.2	<0.2	<0.2
Chromium	7.9	210	5.72	6.95	34.9
Copper	921	2,900	3.25	3.33	31.4
Iron		55,000	5,780	6,580	18,700
Lead	49.6		1.76	1.88	4.26
Manganese	223	3,600	146	151	495
Selenium	2.03	23	<4.0	<4.0	4.4
Silver	0.189	390	<0.5	<0.5	<0.5
Zinc	886	390	10.5	11.8	35.3
Mercury	0.00509	23	0.043	0.18	0.125

Orange = Exceeded Idaho Initial Default Target Levels (IDTLs).

Yellow = Exceeded Human Health Screening Levels (HHSLs).

Table 2 identifies when the results of metals analysis exceeded BLM benchmarks. The only metals analysis value which exceeded the BLM risk benchmarks was background soil sample QCBGSS1 for copper, which exceeded the concentration for the robin by 4.4 times.

Table 2. Wildlife and Livestock Risk Management Criteria for Metals in Soils (mg/kg)
BLM Technical Note 390 Rev. 2004 "Risk Management Criteria for Metals at BLM Mining Sites"

Metals	Elk	Mule Deer	Deer Mine	Cotton- tail Rabbits	Canada Goose	Mallard	Robin	Cattle	Sheep	Median Values	Sediment Sample MOPPESD1	Background Sediment Sample QCBGSD1	Background Soil Sample QCBGSS1
Antimony											<2.0	<2.0	<2.0
Arsenic	328	200	230	438	61	116	4	419	275	275	<2.5	<2.5	<2.5
Barium											40.5	43.8	200
Cadmium	3	3	7	6	2	1	0.3	15	12	8	<0.2	<0.2	<0.2
Chromium											5.72	6.95	34.9
Copper	131	102	640	358	161	141	7	413	136	136	3.25	3.33	31.4
Iron											5,780	6,580	18,700
Lead	127	106	142	172	34	59	6	244	125	125	1.76	1.88	4.26
Manganese											146	151	495
Selenium											<4.0	<4.0	4.4
Silver											<0.5	<0.5	<0.5
Zinc	275	222	419	373	271	196	43	1,082	545	307	10.5	11.8	35.3
Mercury	11	11	2	15	6	4	1	45	8	8	0.043	0.18	0.125

Bold = Metals concentrations exceeded the BLM Risk Management Criteria

PPE sediment sample MOPPESD1 did not exceed any BLM benchmarks. The PPE sample represents a point where any overland migration of hazardous substances would reach Queen Creek and be detected.

9.3 Water Quality Sample Analysis

There is significant interaction between surface water and ground water systems, with the latter being more influent on the former. However, as discussed below and field parameters and laboratory analyses indicated, although metals are present locally, buffering capacity in host rock in the water column stifles migration of metals through the local surface water and ground water systems.

Surface water sample QCBGSW1, which is the background surface water sample taken upstream of the mining activities, exceeded the DEQ ground water standard for iron by 1.3 times.

Sample QCPPEW1 is the probable point of entry sample taken downstream of the mining activities. This would be a point where any overland migration of hazardous substances would reach Queen Creek. This surface water sample exceeded the DEQ ground water standard for iron by 1.006 times.

The values shown in Table 3 are unremarkable. It is unlikely any human health risks or ecological health risks are associated with this area.

Table 3. Total Recoverable Metals Analysis in Surface Water – Madre d’Oro Mine
(Concentrations expressed in mg/l unless otherwise stated.)

Description	DEQ Ground Water Standard (T)	DEQ Drinking Water Standard MCL	DEQ Cold Water Biota Standard Acute	DEQ Cold Water Biota Standard Chronic	Surface Water Sample QCBGSW1	Surface Water Sample QCPPEW1
Antimony					<0.020	<0.020
Arsenic	0.05	0.01	0.36	0.19	<0.025	<0.025
Barium	2	2			0.0168	0.0144
Cadmium	0.005	0.005	0.00082 (H)	0.00037 (H)	<0.0020	<0.0020
Chromium (Total)	0.1	0.1			<0.0060	<0.0060
Copper	1.3		0.0046 (H)	0.0035 (H)	<0.01	<0.01
Iron	0.3*				0.416	0.302
Lead	0.015	0.15	0.014 (H)	0.00054 (H)	<0.0075	<0.0075
Manganese	0.05				0.0301	0.0191
Selenium	0.05	0.05	0.018 (T)	0.005 (T)	<0.040	<0.040
Silver	0.1*		0.0032 (H)		<0.0050	<0.0050
Zinc	5*		0.035 (H)	0.032 (H)	<0.01	<0.01
Mercury	0.002					
Conductivity					0.034	0.029
pH					7.77	7.52

*Secondary MCL (T) – Standard in Total (H) – Hardness dependent *23mg/l

Iron exceeded DEQ Ground Water Standard.

Section 10. Pathways and Environmental Hazards

10.1 Ground Water Pathways

In areas where historic mines are located in proximity to residential areas, contamination of drinking water systems may come from two types of mine sources (ore bodies and waste dumps) and along three pathways illustrated by the following three scenarios. First, heavy metals leach from tailings piles and waste rock dumps, enter ephemeral or perennial drains, and then contaminate the area's shallow ground water system. Second, heavy metals leach from the local ore bodies and are transported through the geologic structure to the shallow ground water. Third, heavy metals could leach out of the ore bodies, and be discharged from the underground workings as adit water, that is then conveyed through ephemeral and perennial drains to the shallow ground water systems.

Using local research and direct observations, the ground water pathway does not appear complete at the Madre d'Oro Mine.

10.2 Surface Water Pathways

The surface water migration pathway target distance limit (TDL) begins at the PPE of surface water runoff from a site to a surface water body and extends downstream for 15 miles. A map showing the source water delineation including the 15-mile surface water TDL for the Madre d'Oro Mine is shown in Figure 4.

The PPE would be Queen Creek which then flows into the American River. No recognizable surface water pathways were noted from the mine to Queen Creek. The boggy area in front of the adit went subsurface before reaching Queen Creek with this water presumably reaching Queen Creek. The American River flows into the South Fork of the Clearwater. The 15 mile TDL is located approximately where Moose Creek enters the South Fork of the Clearwater River.

10.3 Domestic Wells and Public Water Supplies

No wells exist on the Madre d'Oro Mine site. There are 77 domestic wells and one public water system located within the four mile radius of the Madre d'Oro Mine (Figure 4). Approximately 16 of the domestic wells are located within the structural geology. The one public water system (Elk City Water & Sewer Assn. ID2250017) is separated by structural geology. The Elk City public water system draws its water from Elk Creek, a surface water source.

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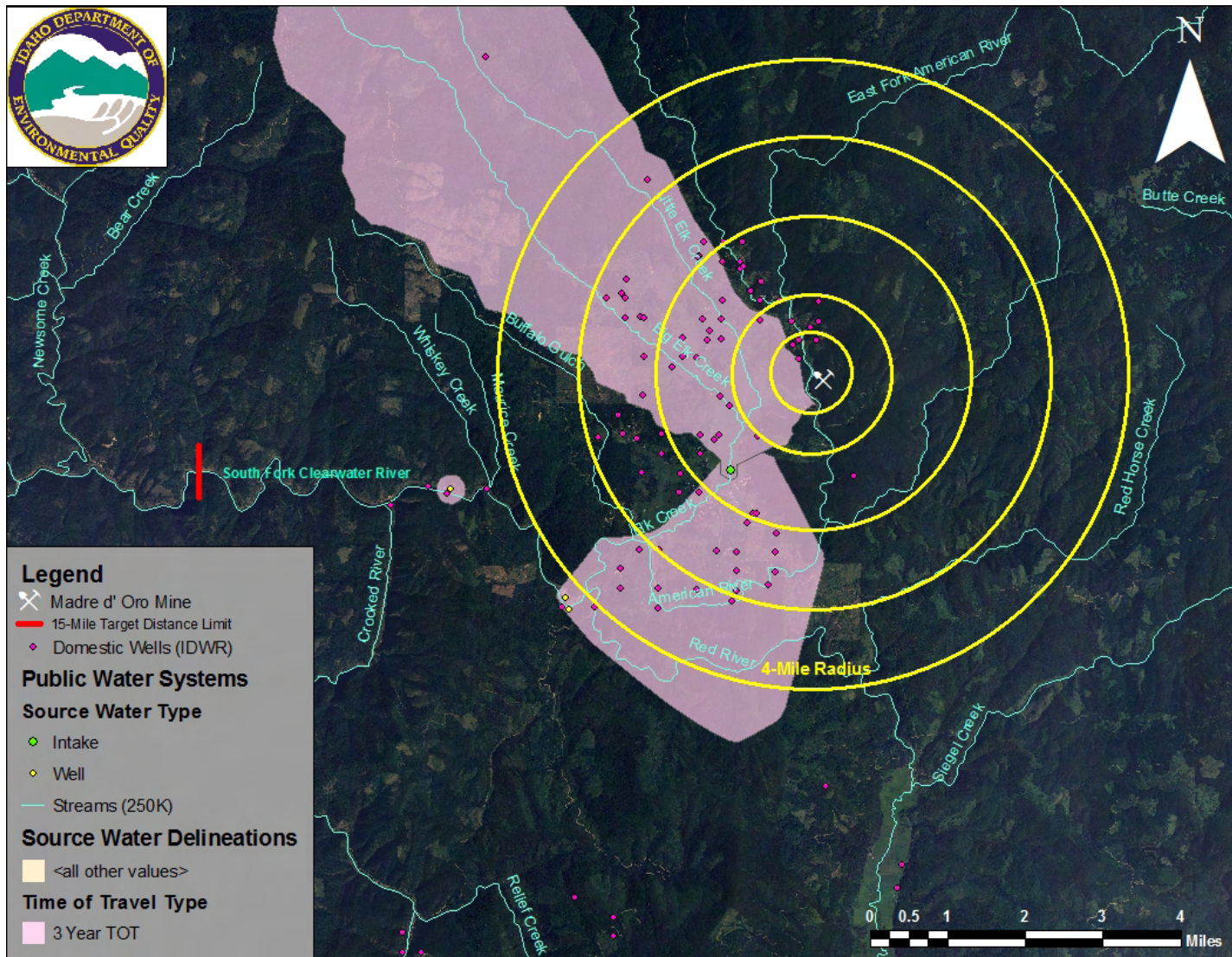


Figure 4. Domestic Wells and Public Water Systems Located Within the 4-Mile Radius, 15-Mile TDL of the Madre d'Oro Mine.

There are no significant wetlands recognized by the U.S. Fish and Wildlife Service in the vicinity.
(Map Source: 2009 Natural Color 1-meter NAIP Idaho)

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The following four paragraphs were taken from DEQ's 2003 Source Water Assessment to provide historical information relative to the Bennett Lumber Products (aka Bennett Forest Industries) facility near Elk City. The facility no longer exists, the mill closed, and all structures, equipment, etc. were removed approximately five years ago.

Two other public water systems within the four-mile radius belong to Bennett Forest Industries (Well #2 – ID2250056 and Well #3 – ID2250056). The Bennett Forest Industries is a non-community, non-transient drinking water system consisting of one active ground water well (Well #2) and an inactive backup well (Well #3). No locational data is provided for the backup well. The systems previously served 50 people through three connections. The active well is located approximately two miles southwest of Elk City, between the South Fork of the Clearwater River and Hwy 14.

The inorganic chemicals antimony and fluoride have been detected at Well #2 at levels at or slightly greater than their Maximum Contaminant Level (MCL). In November 1997, antimony was detected at 6 mg/L, a level equal to the MCL. Fluoride was detected in November 1997 at 4.4 mg/L and again in June 2001 at 4.1 mg/L, levels slightly above the MCL of 4 mg/L. Arsenic was detected at high levels in Well #2. In November 1997 arsenic was detected at 28 mg/L and again in June 2001 at 27 mg/L, levels greater than the recently revised MCL of 10 mg/L. In October 2001, the EPA lowered the arsenic MCL from 50 mg/L to 10 mg/L, giving PWSs until 2006 to meet the new requirement. No volatile organic chemicals or synthetic organic chemicals have ever been detected in the system. Trace concentrations of inorganic chemicals barium, chromium, nitrate, selenium, and sulfate have been detected in tested water, but at concentrations significantly below the MCLs as set by the EPA.

The Madre d'Oro Mine is located in the source water delineation zone with a time of travel of three years. The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with the University of Idaho to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water in the vicinity of the Bennett Forest Industries well. The computer model used site specific data, assimilated by the University of Idaho from a variety of sources including operator input, local area well logs, and hydrogeologic reports.

The conceptual hydrogeologic model for the Bennett Forest Industries source well near Elk City, Idaho is based on interpretation of available well logs. The source well log indicates water is derived from fractured crystalline rock. Based on the geologic map of the Elk City quadrangle at a scale of 1:250,000 (Mitchell and Bennett, 1979), the well is in metamorphosed intrusive rock. Rock described as "granite" on the source well log is probably gneiss, based upon the geologic map and experience. Reference to all non-basalt rock in the area as "granite" is a frequently-made error among drillers and road-builders in this region.

The Junction Lodge PWS (ID2250030) is located within the 15-mile TDL outside of the 4-mile radius. Although all structures and buildings still remain, the Junction Lodge has not been open

or in operation since 2001. The Junction Lodge drinking water system consists of a single well with six-inch casing drilled to a depth of 127 feet through granite. The water is pumped to two 1,000-gallon storage tanks and is used to supply a motel and RV park. The system rated high susceptibility to inorganic contaminants, volatile organic contaminants, synthetic organic contaminants, and microbial contaminants. The high ratings can be attributed, in large part, to the number and nature of potential contaminant sources within the circle of a 1000-foot radius about the well.

10.4 Air Quality Pathways

The air quality pathways are not complete. No residences currently exist on the Madre d'Oro Mine site and associated claims. The waste dump is well vegetated and stable.

10.5 Soil Exposures

The soil exposure pathways are not complete. No permanent residents presently reside on the Madre d'Oro Mine site and associated claims, nor are there any site workers. All historic mine and mill site related disturbances are well vegetated and stable. The mine area is accessible, although no evidence existed of any recent disturbances or activity aside from casual use by campers or recreationists.

10.6 Residences, Schools, and Day Care Facilities

The nearest potential permanent residents are approximately 0.7 mile down gradient and downstream of Queen Creek and are located above/uphill of the American River. There is one elementary school and one pre-school in Elk City. There are no daycares in Elk City.

10.7 Wetlands

There are no significant wetlands recognized by the U.S. Fish and Wildlife Service in the vicinity. The adit seepage did form a boggy area in front of the collapsed adit, but went subsurface prior to Queen Creek.

10.8 Sensitive, Rare, and Threatened Species (Plant and Animal)

Most of the sensitive species have huge ranges which overlap onto the Madre d'Oro Mine site. Due to the size of those ranges, these species may not receive significant exposure time or doses to heavy metals. It is possible one or all of these plant species could grow on soils with elevated metals.

Seven rare or sensitive plant species are documented to exist within the 4-mile radius of the Madre d'Oro Mine (Figure 5). The following plants are listed as no status.

Rare or sensitive plants include:

Candystick (*Allotropa virgate*)
Case's Corydalis (*Corydalis caseana* ssp. *hastata*)
Idaho Strawberry (*Waldsteinia idahoensis*)
Payson's Milkvetch (*Astragalus paysonii*)
Plumed Clover (*Trifolium plumosum* ssp. *Amplifolium*)
Bank Monkeyflower (*Mimulus clivicola*)
Deer Fern (*Blechnum spicant*)

Below is a list of non-game and game animals listed within the 4-mile radius of the Madre d'Oro Mine. The non-game animals, with the exception of the Lynx, are listed as "species of concern" and have no status. The game animals are regulated by the Idaho Department of Fish and Game (IDFG). Because of the larger range these animals utilize compared to the mine site area, the well vegetated dumps, and the unremarkable water chemistry results, it is unlikely there is a significant source for exposure (Figure 5).

Listed Threatened Animal Species of Concern:

Lynx (*Lynx canadensis*)

No Status Animal Species of Concern:

Pale Jumping-slug (*Hemphillia camelus*)
Smoky Taildropper (*Prophysaon humile*)
Fisher (*Martes pennant*)
Great Gray Owl (*Strix nebulosa*)
Idaho Giant Salamander (*Dicamptodon aterrimus*)
Inland Tailed Frog (*Ascaphus montanus*)
Columbia Spotted Frog (*Rana luteiventris*)
Northern Goshawk (*Accipiter gentilis*)
Barred Owl (*Strix varia*)
Northern Leopard Frog (*Rana pipiens*)
A Mayfly (*Caudatella edmundsi*)
Yellow-bellied Marmot (*Marmota flaviventris*)
Merlin (*Falco columbarius*)

Recently Delisted in Idaho Animal Species of Concern:

Gray Wolf (*Canis lupus*)
Potential Wolf Range (Nez Perce)

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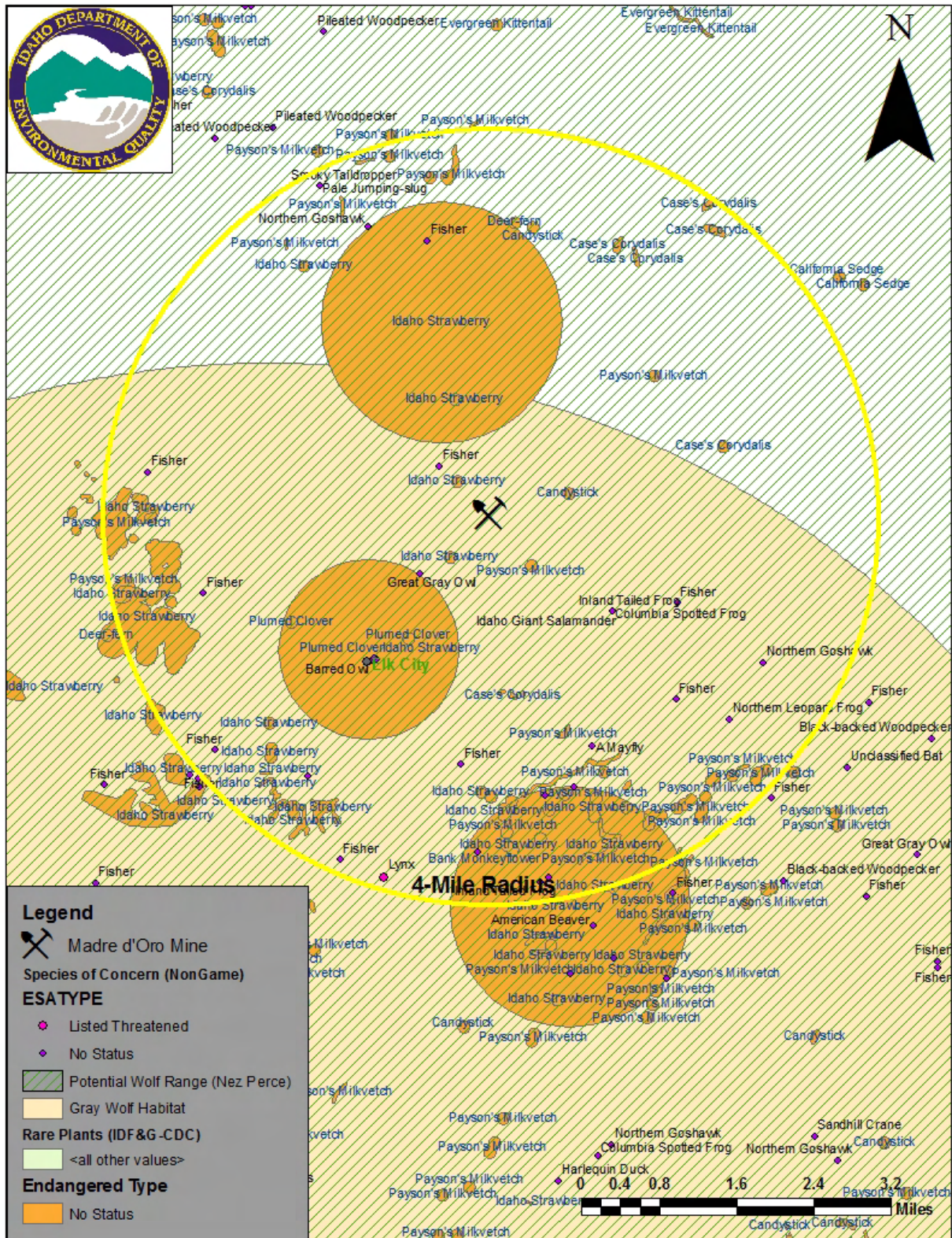


Figure 5. Sensitive Species In and Around the Madre d'Oro; Species of Concern (Plants and Animals)

(Map Sources: SDE Feature Dataset, Animal Conservation Database; Idaho DEQ GIS ArcSDE 9.2 Geodatabase)

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10.9 Fisheries

The following fish species have been observed by IDFG within the four mile radius of the Madre d'Oro Mine (Figure 6). The Chinook Salmon are in an Ecologically Significant Unit (ESU) (fall and spring-summer runs).

In general the area is classified as “critical habitat” for all of the species, with the exception of the brook trout. This area is classified as “known occupied for the bull trout.” Results of the water chemistry analysis for the mining district indicate no threat to these fish from mine related discharges.

Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)
Sockeye Salmon (Snake River Runs) (*Oncorhynchus nerka*)
Chinook Salmon (*Oncorhynchus tshawytscha*) (Fall/Spring/Summer runs)
Bull Trout (*Salvelinus confluentus*)
Steelhead (*Oncorhynchus mykiss*)
Redband Trout (*Oncorhynchus mykiss*)
Brook Trout (*Salvelinus fontinalis*)

10.10 Sensitive Waterways

Queen Creek, a tributary to American River, is listed as waterbody ID17060305CL052_02, and is listed on the State of Idaho 303(d) list for impaired waters. Queen Creek is listed as not supporting cold water aquatic life and salmonid spawning due to temperature. The Clean Water Act (CWA) requires the state to prepare a report, listing (a) the current conditions of all state waters and (b) those waters that are impaired and needing a TMDL (total maximum daily load). The South Fork Clearwater River and tributaries has a completed and approved TMDL. The first list is called the 305(b) list and the second is called the 303(d) list. Both lists are named in accordance with the sections of the CWA where they are defined; together they are known as the Integrated Report. Although they are maintained as separate lists and presented separately in the Integrated Report, impaired waters are just some of the state's waters, so water on the 303(d) list is actually a subset of those on the 305(b) list. Figure 7 illustrates the 303(d) listed streams in the general area of the mine.

10.11 Livestock Receptors

The Madre d'Oro Mine is not contained within a BLM grazing allotment. No evidence of livestock being pastured on a long term basis was noted at the Madre d'Oro Mine. Therefore, pathways or exposures for livestock are minimal including those pathways to horses used by packers for hunting and recreation. No maintained trails or paths were observed during the site visit.

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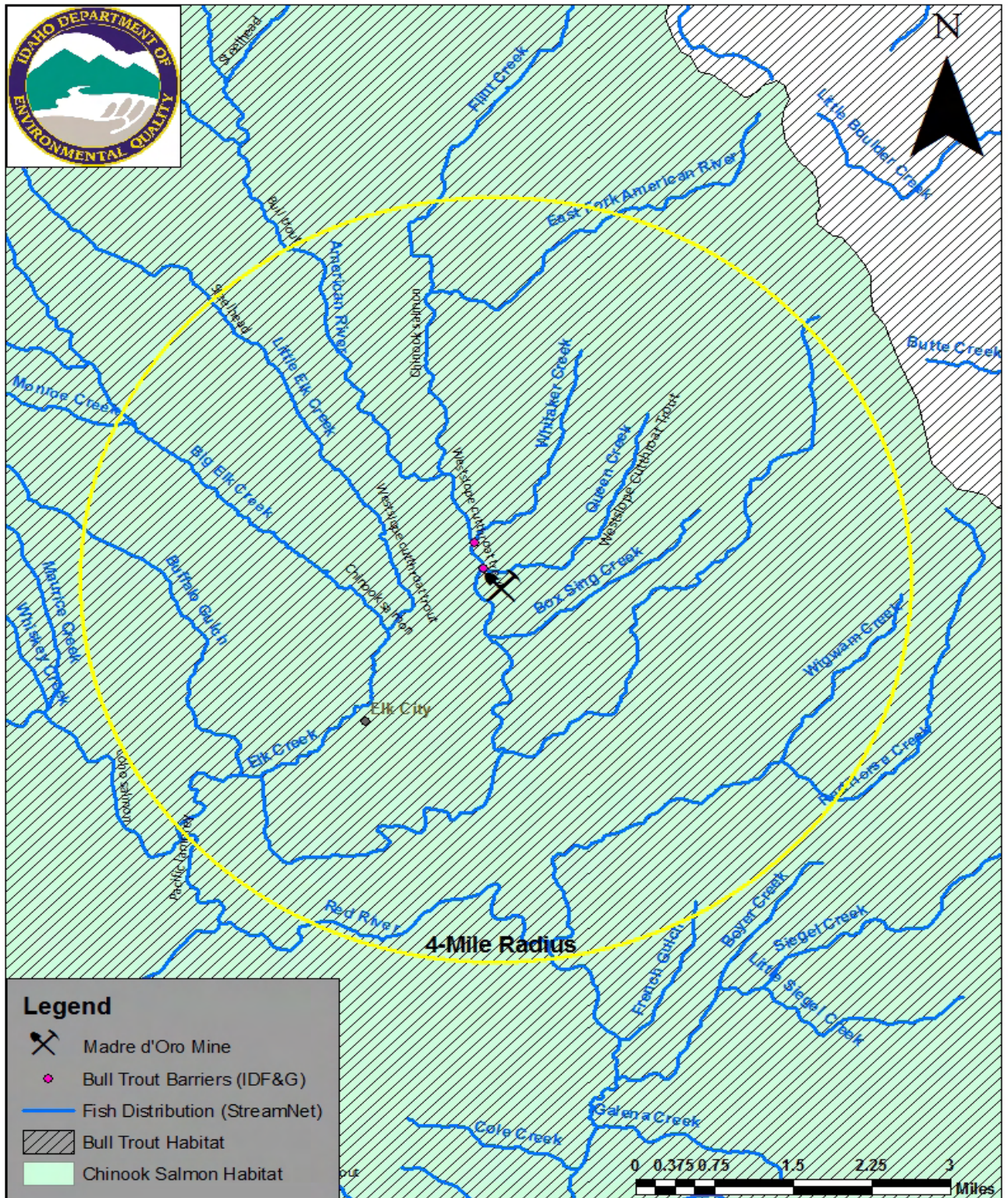


Figure 6. Fisheries Within 4-Mile Radius and in the Vicinity of the Madre d'Oro Mine
 (Map source: SDE Feature Dataset, Idaho DEQ GIS ArcSDE 9.2 Geodatabase)

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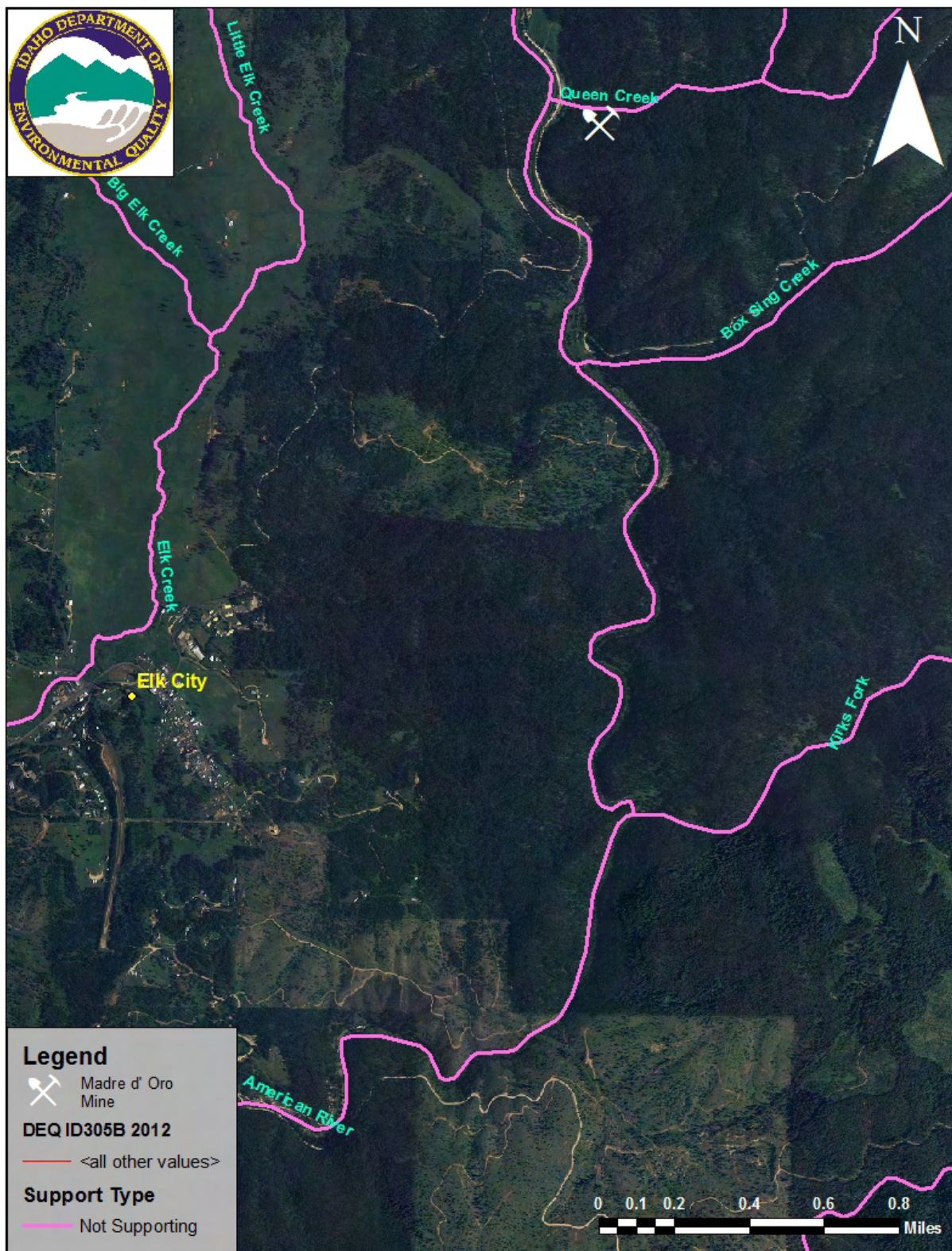


Figure 7. State of Idaho 303(d) Map for Impaired Waters Not Supporting Cold Water Aquatic Life and Salmonid Spawning Due to Temperature
 (Map Source: DEQ.GIS.ArcSDE 9.3 Geodatabase, NAIP 2004)

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Section 11. Summary and Conclusions

The data and observations made during DEQ's September 8, 2011 site visit have been used to come to specific conclusions regarding this private property and to some extent regarding cumulative effects of all public and private mining properties in the watershed.

Generally speaking, toxicological risks to human and ecological receptors are unlikely at the Madre d'Oro Mine. This is due to the lack of residences or structures, no site workers present, and limited use of this area by the public.

The air, soil, and water pathways are not complete. All historic mine and mill site related disturbances are well vegetated and stable. Although no evidence existed of any recent disturbances or activity, the mine site is accessible. No established recreational trails or paths were present. The laboratory results from the soil, sediment, and water samples were not remarkable for a mineralized area.

The BLM soil risk benchmarks indicated background soil sample QCBGSS1 exceeded the copper concentration for the robin by 4.4 times. No evidence of livestock or grazing was observed.

The Madre d'Oro Mine is not located within the source water delineation zone. No drinking water sources, wells, or ground water sources exist on the Madre d'Oro Mine site.

Based on existing conditions and uses, historic information, sampling data, observations made during the site visit, analysis of the mine wastes, potential pathway of contaminants to receptors and potential exposures to ecological and human receptors, **DEQ recommends the determination of the Madre d'Oro Mine and associated claims as No Remedial Action is Planned (NRAP).**

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Section 12. References

- BLM (U.S. Bureau of Land Management) 2011. *Land Patent Details* – BLM GLO Records.
http://www.glorerecords.blm.gov/results/default.aspx?searchCriteria=type=survey|st=ID|cty=049|twp_nr=29|twp_dir=N|rng_nr=08|rng_dir=E#resultsTabIndex=0
- DEQ (Idaho Department of Environmental Quality) 2002. South Fork Clearwater River Subbasin Assessment and TMDL.
- DEQ (Idaho Department of Environmental Quality) 2011. Safe Drinking Water Information System (SDWIS).
- DEQ (Idaho Department of Environmental Quality) 2012. 2012 305(b) list. Available URL:
<http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report.aspx#2012-IR>
- DEQ (Idaho Department of Environmental Quality) 2003. Source Water Assessment.
- Gaston, M.P. and E.H. Bennett. 1979. Geologic Map of the Elk City Quadrangle, Idaho, Scale 1:250,000. Idaho Bureau of Mines and Geology.
- IDFG (Idaho Department of Fish and Game) 2002. Available URL:
http://www2.state.id.us/fishgame/info/cdc/plants/vasc_plants&status_n-r.htm
- IDFG (Idaho Department of Fish and Game) 2002. Fisheries information GIS layer.
- IDWR (Idaho Department of Water Resources) 1997. COVERAGE IDOWN -- Idaho Surface Ownership.
- IDWR2, 2010. GIS shape file of well database.
- IGS (Idaho Geological Survey). Erdman, Ted, Kauffman, John, Bennett, Earl H., Mitchell, Victoria E. 2003. *Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region I) Nez Perce National Forest. Volume III, Section B: Elk City, Orogrande, Buffalo Hump, and Surrounding Areas, Idaho County, Idaho*. Prepared for the U.S. Forest Service Under Participating Agreement No. FS-01-96-14-2800. Staff Report 03-22.
- Lorain, S.H. 1938. Gold Mining and Milling in Idaho County, Idaho: U.S. Bureau of Mines Information Circular 7039, 84 p.

- Mitchell, V.E., E.H. Bennett. 1979. Geologic map of the Baker quadrangle, Idaho. Idaho Bureau of Mines and Geology, Geologic map series Baker 2 Quadrangle, scale 1:250,000.
- Shenon, P.J. and J.C. Reed. 1934. Geology and Ore Deposits of the Elk City, Orogrande, Buffalo Hump, and Tenmile Districts, Idaho County, Idaho: U.S. Geological Survey Circular 9.
- Thomson, Frances A. and Samuel M. Ballard. 1924. Geology and Gold Resources of North Central Idaho. Idaho Bureau of Mines and Geology Bulletin No. 7.

Appendix A. Laboratory Sample Reports



CHAIN OF CUSTODY RECORD

SVL Analytical Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1256 • FAX: (208) 783-0891

Page 1 of 1

W110523

FOR SVL USE ONLY
SVL JOB #

Report to Company: JDLG

Contact: Tina Elayer
Address: 1410 N. Hilton
Phone Number: 208-373-0563
FAX Number: 208-373-0154
E-mail: tina-elayer@deg-idhwy

Invoice Sent To: Walt Elayer
Contact: Samuel
Address: _____
Phone Number: _____
FAX Number: _____
PO#: _____

Table 1. -- Matrix Type

1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other

Project Name: Blk City PAS

Sampler's Signature: [Signature]

Indicate State of sample origination: PO

USACE? ☐ Yes ☐ No

Please take care to distinguish between:
1 and I
2 and Z
5 and S
0 and O

Thanks!

Sample ID	Collection	Date	Time	Collected by: (Unit)	Misc.	Preservative(s)	Other (Specify)	Analyses Required	Rush Instructions (Days)	Comments
QCBGSS1		9/18/11	12:35	TEB	1			As per 2		Water - unfiltered
MUPPESD1		9/18/11	13:30	TEB	1			X X X X X X		-9 mesh sieved
HPADISW1		9/18/11	14:55	TEB	1			X X X X X X		-9 mesh sieved
QCBGSSW1		9/18/11	15:00	TEB	1			X X X X X X		-9 mesh sieved
QCPRESW1		9/18/11	15:15	TEB	1			X X X X X X		-9 mesh sieved
QCBGSD1		9/18/11	12:40	TEB	1			X X X X X X		-9 mesh sieved
Relinquished by:	Tina Elayer		Date:	9/18/11	Time:	18:25	Received by:	[Signature]		
Relinquished by:	[Signature]		Date:	9/18/11	Time:	16:30	Received by:	[Signature]		

* Sample Reject:

☐ Return ☐ Dispose

☒ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 9/05

SAMPLE RECEIPT/CHAIN-OF -CUSTODY CHECKLIST

The following items were checked for completeness, correctness, and compliance to project specifications using the Chain-of-Custody (COC) and other supporting information.

Date of acceptance: 9/22/11

By: CP Seery

SVL Work No: WI-10553

Item	Description	V	VC	NV	NA	Comments
1	Client or project name	✓				1 DEQ
2	Date and time of receipt at lab	✓				9/21/11 16:30
3	Received by	✓				CP Seery
4	Temperature blank or cooler temperature	Q6				Temp. 16.1 °C.
5	Were the sample(s) received on ice				✓	NO
6	Custody tape/bottle seals				✓	
7	Condition of samples upon receipt (leaking; bubbles in VOA vials)	✓				Good
8	Sample numbers/IDs agree with COC	✓				
9	Sample date & time agree with COC	✓				
10	Number of containers for each sample	✓				
11	The correct preservative for the analysis requested	✓				
12	Did an SVL employee preserve sample(s) upon receipt				✓	NO
12	Type of container for each sample / volume received	✓				
13	Analysis requested for each sample	✓				
14	Sample matrix description	✓				
15	COC properly completed & legible	✓				
16	Corrections properly made (initials & date)				✓	
17	Additional comments or records of sample condition or treatment (unlisted or missing samples at laboratory, aliquot taken, sample hold, samples subcontracted, communications between client and laboratory)				✓	
18	Shipper's air bill	✓				

V- Verified VC- Verified Corrections Made NV-Not Verified NA- Not Applicable

Additional Comments: _____



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W110553**
Reported: 04-Oct-11 14:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
QCBGSS1	W110553-01	Soil	08-Sep-11 12:35	TE	21-Sep-2011
MOPPESD1	W110553-02	Soil	08-Sep-11 13:30	TE	21-Sep-2011
HFAD1SW1	W110553-03	Surface Water	08-Sep-11 14:55	TE	21-Sep-2011
QCBGSW1	W110553-04	Surface Water	08-Sep-11 13:00	TE	21-Sep-2011
QCPPESW1	W110553-05	Surface Water	08-Sep-11 13:15	TE	21-Sep-2011
QCBGSD1	W110553-06	Soil	08-Sep-11 12:40	TE	21-Sep-2011

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

(Q6) SVL received the following containers outside of published EPA guidelines for preservation temperatures (0-6°C).

The guidelines do not pertain to nitric-preserved metals.

Default Cooler (Received Temperature: 16.1°C)

<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>	<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>
W110553-01 A	Bag, cloth	QCBGSS1	W110553-02 A	Bag, cloth	MOPPESD1
W110553-03 B	Nitric HDPE	HFAD1SW1	W110553-04 B	Nitric HDPE	QCBGSW1
W110553-05 B	Nitric HDPE	QCPPESW1	W110553-06 A	Bag, cloth	QCBGSD1



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W110553**
Reported: 04-Oct-11 14:53

Client Sample ID: **QCBGSS1**SVL Sample ID: **W110553-01 (Soil)**

Sample Report Page 1 of 1

Sampled: 08-Sep-11 12:35
Received: 21-Sep-11
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.4		W139357	AS	10/04/11 11:40	
EPA 6010B	Arsenic	< 2.5	mg/kg	2.5	0.4		W139357	AS	10/04/11 11:40	
EPA 6010B	Barium	200	mg/kg	0.200	0.024		W139357	AS	10/04/11 11:39	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.02		W139357	AS	10/04/11 11:39	
EPA 6010B	Chromium	34.9	mg/kg	0.60	0.05		W139357	AS	10/04/11 11:39	
EPA 6010B	Copper	31.4	mg/kg	1.00	0.21		W139357	AS	10/04/11 11:39	
EPA 6010B	Iron	18700	mg/kg	6.0	1.1		W139357	AS	10/04/11 11:38	
EPA 6010B	Lead	4.26	mg/kg	0.75	0.21		W139357	AS	10/04/11 11:40	
EPA 6010B	Manganese	495	mg/kg	0.40	0.04		W139357	AS	10/04/11 11:38	
EPA 6010B	Selenium	4.4	mg/kg	4.0	1.2		W139357	AS	10/04/11 11:40	
EPA 6010B	Silver	< 0.50	mg/kg	0.50	0.04		W139357	AS	10/04/11 11:39	
EPA 6010B	Zinc	35.3	mg/kg	1.00	0.09		W139357	AS	10/04/11 11:39	
EPA 7471A	Mercury	0.125	mg/kg	0.033	0.007		W140117	JAA	09/29/11 10:27	

Percent Solids

Percent Solids	% Solids	95.7	%	0.1			W139358	DP	10/03/11 13:33	
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This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W110553**
Reported: 04-Oct-11 14:53

Client Sample ID: **MOPPESD1**SVL Sample ID: **W110553-02 (Soil)**

Sample Report Page 1 of 1

Sampled: 08-Sep-11 13:30
Received: 21-Sep-11
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.4		W139357	AS	10/04/11 11:46	
EPA 6010B	Arsenic	< 2.5	mg/kg	2.5	0.4		W139357	AS	10/04/11 11:46	
EPA 6010B	Barium	40.5	mg/kg	0.200	0.024		W139357	AS	10/04/11 11:45	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.02		W139357	AS	10/04/11 11:46	
EPA 6010B	Chromium	5.72	mg/kg	0.60	0.05		W139357	AS	10/04/11 11:45	
EPA 6010B	Copper	3.25	mg/kg	1.00	0.21		W139357	AS	10/04/11 11:45	
EPA 6010B	Iron	5780	mg/kg	6.0	1.1		W139357	AS	10/04/11 11:44	
EPA 6010B	Lead	1.76	mg/kg	0.75	0.21		W139357	AS	10/04/11 11:46	
EPA 6010B	Manganese	146	mg/kg	0.40	0.04		W139357	AS	10/04/11 11:44	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.2		W139357	AS	10/04/11 11:46	
EPA 6010B	Silver	< 0.50	mg/kg	0.50	0.04		W139357	AS	10/04/11 11:45	
EPA 6010B	Zinc	10.5	mg/kg	1.00	0.09		W139357	AS	10/04/11 11:46	
EPA 7471A	Mercury	0.043	mg/kg	0.033	0.007		W140117	JAA	09/29/11 10:29	

Percent Solids

Percent Solids	% Solids	87.3	%	0.1			W139358	DP	10/03/11 13:33	
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This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

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IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W110553**
Reported: 04-Oct-11 14:53

Client Sample ID: **HFAD1SW1**SVL Sample ID: **W110553-03 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 08-Sep-11 14:55
Received: 21-Sep-11
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000072		W140067	JAA	09/29/11 12:51	
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Metals (Total Recoverable)

EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.005		W139320	AS	10/02/11 13:46	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.007		W139320	AS	10/02/11 13:46	
EPA 6010B	Barium	0.0313	mg/L	0.0020	0.0004		W139320	AS	10/02/11 13:46	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W139320	AS	10/02/11 13:46	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0006		W139320	AS	10/02/11 13:46	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.003		W139320	AS	10/02/11 13:45	
EPA 6010B	Iron	0.118	mg/L	0.060	0.017		W139320	AS	10/02/11 13:44	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0034		W139320	AS	10/02/11 13:46	
EPA 6010B	Manganese	0.0189	mg/L	0.0040	0.0011		W139320	AS	10/02/11 13:44	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.009		W139320	AS	10/02/11 13:46	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0005		W139320	AS	10/02/11 13:45	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0021		W139320	AS	10/02/11 13:46	

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

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W110553**
Reported: 04-Oct-11 14:53

Client Sample ID: **QCBGSW1**SVL Sample ID: **W110553-04 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 08-Sep-11 13:00
Received: 21-Sep-11
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000072		W140067	JAA	09/29/11 12:53	
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Metals (Total Recoverable)

EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.005		W139320	AS	10/02/11 14:02	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.007		W139320	AS	10/02/11 14:02	
EPA 6010B	Barium	0.0168	mg/L	0.0020	0.0004		W139320	AS	10/02/11 14:02	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W139320	AS	10/02/11 14:02	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0006		W139320	AS	10/02/11 14:02	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.003		W139320	AS	10/02/11 14:01	
EPA 6010B	Iron	0.416	mg/L	0.060	0.017		W139320	AS	10/02/11 14:00	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0034		W139320	AS	10/02/11 14:02	
EPA 6010B	Manganese	0.0301	mg/L	0.0040	0.0011		W139320	AS	10/02/11 14:00	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.009		W139320	AS	10/02/11 14:02	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0005		W139320	AS	10/02/11 14:01	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0021		W139320	AS	10/02/11 14:02	

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

John Kern
Laboratory Director



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Kellogg ID 83837-0929

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IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W110553**
Reported: 04-Oct-11 14:53

Client Sample ID: **QCPPEWS1**SVL Sample ID: **W110553-05 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 08-Sep-11 13:15
Received: 21-Sep-11
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	< 0.00020	mg/L	0.00020	0.000072		W140067	JAA	09/29/11 12:55	
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Metals (Total Recoverable)

EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.005		W139320	AS	10/02/11 14:07	
EPA 6010B	Arsenic	< 0.025	mg/L	0.025	0.007		W139320	AS	10/02/11 14:07	
EPA 6010B	Barium	0.0144	mg/L	0.0020	0.0004		W139320	AS	10/02/11 14:07	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0005		W139320	AS	10/02/11 14:07	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0006		W139320	AS	10/02/11 14:07	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.003		W139320	AS	10/02/11 14:07	
EPA 6010B	Iron	0.302	mg/L	0.060	0.017		W139320	AS	10/02/11 14:06	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0034		W139320	AS	10/02/11 14:07	
EPA 6010B	Manganese	0.0191	mg/L	0.0040	0.0011		W139320	AS	10/02/11 14:06	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.009		W139320	AS	10/02/11 14:07	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0005		W139320	AS	10/02/11 14:07	
EPA 6010B	Zinc	< 0.0100	mg/L	0.0100	0.0021		W139320	AS	10/02/11 14:07	

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

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706**Project Name: Boise**
Work Order: **W110553**
Reported: 04-Oct-11 14:53Client Sample ID: **QCBGSD1**SVL Sample ID: **W110553-06 (Soil)**

Sample Report Page 1 of 1

Sampled: 08-Sep-11 12:40
Received: 21-Sep-11
Sampled By: TE

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	< 2.0	mg/kg	2.0	0.4		W139357	AS	10/04/11 11:52	
EPA 6010B	Arsenic	< 2.5	mg/kg	2.5	0.4		W139357	AS	10/04/11 11:52	
EPA 6010B	Barium	43.8	mg/kg	0.200	0.024		W139357	AS	10/04/11 11:51	
EPA 6010B	Cadmium	< 0.20	mg/kg	0.20	0.02		W139357	AS	10/04/11 11:52	
EPA 6010B	Chromium	6.95	mg/kg	0.60	0.05		W139357	AS	10/04/11 11:51	
EPA 6010B	Copper	3.33	mg/kg	1.00	0.21		W139357	AS	10/04/11 11:51	
EPA 6010B	Iron	6580	mg/kg	6.0	1.1		W139357	AS	10/04/11 11:50	
EPA 6010B	Lead	1.88	mg/kg	0.75	0.21		W139357	AS	10/04/11 11:52	
EPA 6010B	Manganese	151	mg/kg	0.40	0.04		W139357	AS	10/04/11 11:50	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.2		W139357	AS	10/04/11 11:52	
EPA 6010B	Silver	< 0.50	mg/kg	0.50	0.04		W139357	AS	10/04/11 11:51	
EPA 6010B	Zinc	11.8	mg/kg	1.00	0.09		W139357	AS	10/04/11 11:52	
EPA 7471A	Mercury	0.180	mg/kg	0.033	0.007		W140117	JAA	09/29/11 10:31	

Percent Solids

Percent Solids	% Solids	96.5	%	0.1			W139358	DP	10/03/11 13:33	
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This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706**Project Name: Boise**
Work Order: **W110553**
Reported: 04-Oct-11 14:53**Quality Control - BLANK Data**

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	mg/L	<0.00020	0.000072	0.00020	W140067	29-Sep-11	
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	<2.0	0.4	2.0	W139357	04-Oct-11	
EPA 6010B	Arsenic	mg/kg	<2.5	0.4	2.5	W139357	04-Oct-11	
EPA 6010B	Barium	mg/kg	<0.200	0.024	0.200	W139357	04-Oct-11	
EPA 6010B	Cadmium	mg/kg	<0.20	0.02	0.20	W139357	04-Oct-11	
EPA 6010B	Chromium	mg/kg	<0.60	0.05	0.60	W139357	04-Oct-11	
EPA 6010B	Copper	mg/kg	<1.00	0.21	1.00	W139357	04-Oct-11	
EPA 6010B	Iron	mg/kg	<6.0	1.1	6.0	W139357	04-Oct-11	
EPA 6010B	Lead	mg/kg	<0.75	0.21	0.75	W139357	04-Oct-11	
EPA 6010B	Manganese	mg/kg	<0.40	0.04	0.40	W139357	04-Oct-11	
EPA 6010B	Selenium	mg/kg	<4.0	1.2	4.0	W139357	04-Oct-11	
EPA 6010B	Silver	mg/kg	<0.50	0.04	0.50	W139357	04-Oct-11	
EPA 6010B	Zinc	mg/kg	<1.00	0.09	1.00	W139357	04-Oct-11	
EPA 7471A	Mercury	mg/kg	<0.033	0.007	0.033	W140117	28-Sep-11	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	<0.020	0.005	0.020	W139320	02-Oct-11	
EPA 6010B	Arsenic	mg/L	<0.025	0.007	0.025	W139320	02-Oct-11	
EPA 6010B	Barium	mg/L	<0.0020	0.0004	0.0020	W139320	02-Oct-11	
EPA 6010B	Cadmium	mg/L	<0.0020	0.0005	0.0020	W139320	02-Oct-11	
EPA 6010B	Chromium	mg/L	<0.0060	0.0006	0.0060	W139320	02-Oct-11	
EPA 6010B	Copper	mg/L	<0.010	0.003	0.010	W139320	02-Oct-11	
EPA 6010B	Iron	mg/L	<0.060	0.017	0.060	W139320	02-Oct-11	
EPA 6010B	Lead	mg/L	<0.0075	0.0034	0.0075	W139320	02-Oct-11	
EPA 6010B	Manganese	mg/L	<0.0040	0.0011	0.0040	W139320	02-Oct-11	
EPA 6010B	Selenium	mg/L	<0.040	0.009	0.040	W139320	02-Oct-11	
EPA 6010B	Silver	mg/L	<0.0050	0.0005	0.0050	W139320	02-Oct-11	
EPA 6010B	Zinc	mg/L	<0.0100	0.0021	0.0100	W139320	02-Oct-11	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	mg/L	0.00511	0.00500	102	80 - 120	W140067	29-Sep-11	
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	105	100	105	80 - 120	W139357	04-Oct-11	
EPA 6010B	Arsenic	mg/kg	103	100	103	80 - 120	W139357	04-Oct-11	
EPA 6010B	Barium	mg/kg	106	100	106	80 - 120	W139357	04-Oct-11	
EPA 6010B	Cadmium	mg/kg	103	100	103	80 - 120	W139357	04-Oct-11	
EPA 6010B	Chromium	mg/kg	106	100	106	80 - 120	W139357	04-Oct-11	
EPA 6010B	Copper	mg/kg	106	100	106	80 - 120	W139357	04-Oct-11	
EPA 6010B	Iron	mg/kg	1030	1000	103	80 - 120	W139357	04-Oct-11	
EPA 6010B	Lead	mg/kg	103	100	103	80 - 120	W139357	04-Oct-11	
EPA 6010B	Manganese	mg/kg	104	100	104	80 - 120	W139357	04-Oct-11	
EPA 6010B	Selenium	mg/kg	99.7	100	99.7	80 - 120	W139357	04-Oct-11	
EPA 6010B	Silver	mg/kg	5.30	5.00	106	80 - 120	W139357	04-Oct-11	
EPA 6010B	Zinc	mg/kg	103	100	103	80 - 120	W139357	04-Oct-11	
EPA 7471A	Mercury	mg/kg	0.857	0.833	103	80 - 120	W140117	28-Sep-11	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	1.05	1.00	105	80 - 120	W139320	02-Oct-11	
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SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 8 of 11



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706**Project Name: Boise**
Work Order: **W110553**
Reported: 04-Oct-11 14:53**Quality Control - LABORATORY CONTROL SAMPLE Data (Continued)**

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total Recoverable) (Continued)									
EPA 6010B	Arsenic	mg/L	1.01	1.00	101	80 - 120	W139320	02-Oct-11	
EPA 6010B	Barium	mg/L	0.941	1.00	94.1	80 - 120	W139320	02-Oct-11	
EPA 6010B	Cadmium	mg/L	1.01	1.00	101	80 - 120	W139320	02-Oct-11	
EPA 6010B	Chromium	mg/L	1.01	1.00	101	80 - 120	W139320	02-Oct-11	
EPA 6010B	Copper	mg/L	0.974	1.00	97.4	80 - 120	W139320	02-Oct-11	
EPA 6010B	Iron	mg/L	10.5	10.0	105	80 - 120	W139320	02-Oct-11	
EPA 6010B	Lead	mg/L	1.03	1.00	103	80 - 120	W139320	02-Oct-11	
EPA 6010B	Manganese	mg/L	1.04	1.00	104	80 - 120	W139320	02-Oct-11	
EPA 6010B	Selenium	mg/L	1.06	1.00	106	80 - 120	W139320	02-Oct-11	
EPA 6010B	Silver	mg/L	0.0465	0.0500	93.1	80 - 120	W139320	02-Oct-11	
EPA 6010B	Zinc	mg/L	1.02	1.00	102	80 - 120	W139320	02-Oct-11	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	mg/L	0.00123	<0.00020	0.00100	110	75 - 125	W140067	29-Sep-11	
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	mg/kg	79.5	8.9	100	70.6	75 - 125	W139357	04-Oct-11	M2
EPA 6010B	Arsenic	mg/kg	446	345	100	102	75 - 125	W139357	04-Oct-11	
EPA 6010B	Barium	mg/kg	676	503	100	R > 4S	75 - 125	W139357	04-Oct-11	M1
EPA 6010B	Cadmium	mg/kg	99.0	0.49	100	98.5	75 - 125	W139357	04-Oct-11	
EPA 6010B	Chromium	mg/kg	165	50.9	100	114	75 - 125	W139357	04-Oct-11	
EPA 6010B	Copper	mg/kg	142	31.9	100	110	75 - 125	W139357	04-Oct-11	
EPA 6010B	Iron	mg/kg	25700	25000	1000	R > 4S	75 - 125	W139357	04-Oct-11	M3
EPA 6010B	Lead	mg/kg	109	11.1	100	97.9	75 - 125	W139357	04-Oct-11	
EPA 6010B	Manganese	mg/kg	318	221	100	97.0	75 - 125	W139357	04-Oct-11	
EPA 6010B	Selenium	mg/kg	108	7.7	100	99.8	75 - 125	W139357	04-Oct-11	
EPA 6010B	Silver	mg/kg	5.85	<0.50	5.00	112	75 - 125	W139357	04-Oct-11	
EPA 6010B	Zinc	mg/kg	241	146	100	95.6	75 - 125	W139357	04-Oct-11	
EPA 7471A	Mercury	mg/kg	3.93	2.98	0.167	R > 4S	75 - 125	W140117	29-Sep-11	D2,M3

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	1.05	<0.020	1.00	105	75 - 125	W139320	02-Oct-11	
EPA 6010B	Arsenic	mg/L	0.997	<0.025	1.00	99.7	75 - 125	W139320	02-Oct-11	
EPA 6010B	Barium	mg/L	1.07	0.0313	1.00	103	75 - 125	W139320	02-Oct-11	
EPA 6010B	Cadmium	mg/L	1.00	<0.0020	1.00	100	75 - 125	W139320	02-Oct-11	
EPA 6010B	Chromium	mg/L	1.01	<0.0060	1.00	101	75 - 125	W139320	02-Oct-11	
EPA 6010B	Copper	mg/L	0.993	<0.010	1.00	99.3	75 - 125	W139320	02-Oct-11	
EPA 6010B	Iron	mg/L	10.4	0.118	10.0	103	75 - 125	W139320	02-Oct-11	
EPA 6010B	Lead	mg/L	1.01	<0.0075	1.00	101	75 - 125	W139320	02-Oct-11	
EPA 6010B	Manganese	mg/L	1.03	0.0189	1.00	102	75 - 125	W139320	02-Oct-11	
EPA 6010B	Selenium	mg/L	1.03	<0.040	1.00	103	75 - 125	W139320	02-Oct-11	
EPA 6010B	Silver	mg/L	0.0510	<0.0050	0.0500	102	75 - 125	W139320	02-Oct-11	
EPA 6010B	Zinc	mg/L	1.00	<0.0100	1.00	100	75 - 125	W139320	02-Oct-11	

SVL holds the following certifications:

AZ:0538, CA:2080, FL(NELAC):E87993, ID:ID00019 & ID00965 (Microbiology), NV:ID000192007A, WA:1268

Work order Report Page 9 of 11



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706**Project Name: Boise**
Work Order: **W110553**
Reported: 04-Oct-11 14:53**Quality Control - MATRIX SPIKE DUPLICATE Data**

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	RPD	RPD Limit	Batch ID	Analyzed	Notes
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Metals (Total)

EPA 7470A	Mercury	mg/L	0.00111	0.00123	0.00100	10.3	20	W140067	29-Sep-11	
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	80.8	79.5	100	1.6	20	W139357	04-Oct-11	
EPA 6010B	Arsenic	mg/kg	451	446	100	1.2	20	W139357	04-Oct-11	
EPA 6010B	Barium	mg/kg	681	676	100	0.7	20	W139357	04-Oct-11	
EPA 6010B	Cadmium	mg/kg	99.1	99.0	100	0.1	20	W139357	04-Oct-11	
EPA 6010B	Chromium	mg/kg	162	165	100	1.9	20	W139357	04-Oct-11	
EPA 6010B	Copper	mg/kg	142	142	100	0.2	20	W139357	04-Oct-11	
EPA 6010B	Iron	mg/kg	25900	25700	1000	0.9	20	W139357	04-Oct-11	
EPA 6010B	Lead	mg/kg	110	109	100	0.8	20	W139357	04-Oct-11	
EPA 6010B	Manganese	mg/kg	324	318	100	1.8	20	W139357	04-Oct-11	
EPA 6010B	Selenium	mg/kg	108	108	100	0.7	20	W139357	04-Oct-11	
EPA 6010B	Silver	mg/kg	5.95	5.85	5.00	1.6	20	W139357	04-Oct-11	
EPA 6010B	Zinc	mg/kg	243	241	100	0.9	20	W139357	04-Oct-11	
EPA 7471A	Mercury	mg/kg	3.17	3.93	0.167	21.6	20	W140117	29-Sep-11	D2,M3

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	1.04	1.05	1.00	0.6	20	W139320	02-Oct-11	
EPA 6010B	Arsenic	mg/L	0.990	0.997	1.00	0.6	20	W139320	02-Oct-11	
EPA 6010B	Barium	mg/L	1.07	1.07	1.00	0.3	20	W139320	02-Oct-11	
EPA 6010B	Cadmium	mg/L	1.00	1.00	1.00	0.3	20	W139320	02-Oct-11	
EPA 6010B	Chromium	mg/L	1.01	1.01	1.00	0.2	20	W139320	02-Oct-11	
EPA 6010B	Copper	mg/L	0.985	0.993	1.00	0.8	20	W139320	02-Oct-11	
EPA 6010B	Iron	mg/L	10.6	10.4	10.0	1.5	20	W139320	02-Oct-11	
EPA 6010B	Lead	mg/L	1.01	1.01	1.00	0.0	20	W139320	02-Oct-11	
EPA 6010B	Manganese	mg/L	1.06	1.03	1.00	2.4	20	W139320	02-Oct-11	
EPA 6010B	Selenium	mg/L	1.03	1.03	1.00	0.2	20	W139320	02-Oct-11	
EPA 6010B	Silver	mg/L	0.0511	0.0510	0.0500	0.3	20	W139320	02-Oct-11	
EPA 6010B	Zinc	mg/L	1.00	1.00	1.00	0.3	20	W139320	02-Oct-11	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/L	1.1	<2.0	1.00	98.5	75 - 125	W139357	04-Oct-11	
EPA 6010B	Barium	mg/L	5.73	5.03	1.00	70.2	75 - 125	W139357	04-Oct-11	M2



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IDEQ (Boise)
1410 N. Hilton
Boise, ID 83706

Project Name: Boise
Work Order: **W110553**
Reported: 04-Oct-11 14:53

Notes and Definitions

D2	Sample required dilution due to high concentration of target analyte.
M1	Matrix spike recovery was high, but the LCS recovery was acceptable.
M2	Matrix spike recovery was low, but the LCS recovery was acceptable.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to spike level. The LCS was acceptable.
LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable