

Abbreviated Preliminary Assessment for Revenue Prospect (aka California, Scott Mine)

Idaho County



**State of Idaho
Department of Environmental Quality**

December 2012



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

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C.L. "Butch" Otter, Governor
Curl Franssen, Director

December 24, 2012

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

Subject: Abbreviated Preliminary Assessment Report for the Revenue Prospect (aka California, Scott Mine), Idaho County, Idaho

Dear Mr. Marcy:

The Revenue Prospect is on patented, private property. In addition to the Revenue Prospect, the Cal-Idaho pit and numerous other mining related sites exist in the area. The Idaho Department of Environmental Quality (DEQ) requested access to the private property from Mr. Allen Scott and permission was granted. Sediment and surface water samples were collected at the mine during the site visit. Mr. Allen Scott will receive a copy of this report.

Attached are two copies DEQ's Abbreviated Preliminary Assessment Report for the Revenue Prospect.

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

The air, soil, and water pathways are not complete. All historic mine related disturbances are well vegetated and stable. Although the mine site is accessible by road and some clearing has been done at the mouth of the adit, no evidence existed of any recent disturbances or activity.

The laboratory results for the water samples were not remarkable for a mineralized area. The sediment sample had elevated mercury and arsenic. Provided the area remains stabilized, no pathways exist for soil movement off site.

The BLM soil risk benchmarks indicated the soil sample RVAD1SD1 exceeded the arsenic, cadmium, copper and mercury concentration for a number of the BLM wildlife and livestock criteria. No evidence of livestock or grazing was observed.

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The Revenue Prospect is located within the source water delineation zone, with a 3-year time of travel (TOT). No drinking water sources, wells, or ground water sources exist on the Revenue Prospect.

Based on existing conditions and uses, historic information, sampling data, observations made during the site visit, and analysis of soil and surface water samples, potential pathway of contaminants to receptors and potential exposures to ecological and human receptors do not exist. **DEQ recommends the determination of the Revenue Prospect as No Remedial Action Planned (NRAP).**

A link to the Abbreviated Preliminary Assessment Report for the Revenue Prospect 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 reports, or DEQ's recommendations, please do not hesitate to call me at (208) 373-0563.

Respectfully,



Tina Elayer
Mine Waste Specialist

attachments

cc: Mr. Allen Scott
Revenue Prospect PA File

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Introduction

This is an abbreviated preliminary assessment (APA) for the Revenue Prospect near Elk City, Idaho. This document provides the rationale for the No Remedial Action Planned (NRAP) determination and that no additional analysis or site investigation is necessary for the Revenue Prospect. Section 1 provides the APA checklist filled out by the assessor to determine that an APA was warranted and that no further action is required from the Idaho Department of Environmental Quality (DEQ). The following sections contain additional relevant information and evidence to support the APA, including historical and geologic information (Section 2), photographs (Section 3), maps (Section 4), and references generated during the site visit or desktop research (Section 5).

Preparer: Daniel D. Stewart **Date:** 10/25/2012
Idaho Department of Environmental Quality
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Grangeville, ID 83530
208-983-0808
daniel.stewart@deq.idaho.gov

Site Name: Revenue Prospect

Previous Names (aka): California, Scott Mine

Site Owner: Allen Scott

Address: HCR 66, Box 322
Kooskia, ID 83539

Site Location: The mine is on private property. On Red River Road (Road 222) go 0.10 mile past its intersection with State Highway 14 and turn onto the Cal-Idaho Pit Road and travel 1.1 miles to the mine site. This is private property and permission to access it must be obtained prior to visiting the site.

Township 29 North, Range 8 East, Section 27

Latitude: 45.81684°N **Longitude:** -115.45834°W

Description of release (or potential release) and its probable nature:

The Revenue Prospect was investigated by DEQ on May 29, 2012, for potential releases of heavy metals by airborne, surface water, or ground water pathways. Additionally, DEQ investigated potential discharges of other deleterious materials, such as petroleum products and ore processing chemicals. No deleterious materials, petroleum products, or ore processing chemicals were evident at the site. The Revenue Prospect adit was discharging water at approximately 1 to 2 gallons per minute (gpm).

Section 1. APA Checklist

Task 1—Superfund Eligibility Evaluation

Assessor, if all answers are “no,” continue to task 2; otherwise, explain any “yes” answers below and then skip to task 3.	YES	NO
1. Is the site currently in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or an “alias” of another site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is the site being addressed by some other remediation program (i.e., federal, state, or tribal)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Are the hazardous substances that may be released from the site regulated under a statutory exclusion (e.g., petroleum, natural gas, natural gas liquids, synthetic gas usable for fuel, normal application of fertilizer, release located in a workplace, naturally occurring, or regulated by the Nuclear Regulatory Commission, Uranium Mill Tailings Radiation Control Act, or Occupational Safety and Health Administration)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Are the hazardous substances that may be released from the site excluded by policy considerations (i.e., deferred to Resource Conservation and Recovery Act corrective action)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Is there sufficient documentation to demonstrate that there is no potential for a release that constitutes risk to human or ecological receptors (e.g., comprehensive remedial investigation equivalent data showing no release above applicable or relevant and appropriate requirements (ARARs), completed removal action, documentation showing that no hazardous substance releases have occurred, or an EPA-approved risk assessment)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Assessor, please explain all “yes” answer(s):

Regarding question 5: A site inspection involving direct observations confirmed that contaminants of concern, including hazardous materials and petroleum products, do not exist in concentrations that present a threat to human health or the environment. No contaminants or hazardous substances remain on the site. Two samples were collected from the Revenue Prospect site. Surface water sample RVAD1SW1 was taken from the adit discharge and sediment sample RVAD1SD1 from the mouth area of the adit.

The Revenue Prospect was discharging water at approximately 1 to 2 gpm. Surface water sample RVAD1SW1 was submitted in accordance with EPA Chain-of-Custody procedures to Silver Valley Laboratories, Inc. (SVL) in Kellogg, Idaho for analysis of RCRA 8 Suite + copper and zinc. A copy of the laboratory report is included as Appendix A. Surface water sample RVAD1SW1 was analyzed for total recoverable metals. Table 1 summarizes the laboratory analysis of the surface water taken from the adit. No airborne pathways exist to any residences. The closest residence to the Revenue Prospect is downstream approximately 0.10 miles.

Table 1. Total recoverable metals analysis in Revenue Mine adit surface water sample RVAD1SW1.**(Concentrations expressed in milligrams per liter [mg/L] unless otherwise noted.)**

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 RVAD1SW1
Antimony	0.006	0.006	—	—	<0.02
Arsenic	0.05	0.01	0.34	0.15	0.417
Barium	2	2	—	—	0.097
Cadmium	0.005	0.005	0.00013 (H)	0.0006 (H)	<0.002
Chromium (Total)	0.1	0.1	—	—	<0.006
Copper	1.3 ^a	1.3 ^b	0.017 (H)	0.0011 (H)	<0.01
Iron	0.3^a	0.3^a	—	—	11.6
Lead	0.015	0.15	0.065 (H)	0.00025 (H)	<0.0075
Manganese	0.05	0.05^a	—	—	0.416
Selenium	0.05	0.05	0.02 (T)	0.005 (T)	<0.04
Silver	0.1 ^a	0.1 ^a	0.0034 (H)	—	<0.005
Zinc	5 ^a	5 ^a	0.12 (H)	0.12 (H)	<0.0266
Mercury	0.002	0.002	—	—	—
pH	6.5 – 8.5 ^c	6.5 – 8.5 ^a	—	6.5 – 9.0 su	—

Note: (T)—Standard in Total, (H)—Hardness dependent Cd, Cu, Pb, Ag, Zn at 100 mg/L

Note: Shaded values indicate exceedances of DEQ's water quality standards. Criteria exceeded are indicated in bold.

^a Secondary Standard MCL – non-enforceable guideline.

^b Action level.

^c No units apply.

^d §141.13(a) One turbidity unit (TU), as determined by a monthly average pursuant to §141.22, except that five or fewer turbidity units may be allowed if the supplier of water can demonstrate to the State that the higher turbidity does not do any of the following:

- (1) Interfere with disinfection;
- (2) Prevent maintenance of an effective disinfectant agent throughout the distribution system; or
- (3) Interfere with microbiological determinations.

§141.13(b) Five turbidity units based on an average for two consecutive days pursuant to §141.22.

The DEQ ground water standard for arsenic was exceeded by 8.3 times, iron by 38.6 times, and manganese by 8.3 times.

The DEQ drinking water standard for arsenic was exceeded by 41.7 times, iron by 38.6 times, and manganese by 8.2 times.

The DEQ cold water biota acute standard for arsenic was exceeded by 1.22 times.

The DEQ cold water chronic biota standard for arsenic was exceeded by 2.78 times.

There are approximately 72 domestic wells and four public water system wells located within the 4-mile radius of the Revenue Prospect. Approximately six of the domestic wells are located within the structural geology. The Elk City Water & Sewer Association public water system (PWS) ID2250017 is separated by structural geology.

The following four paragraphs were taken from DEQ's 2002/2003 Source Water Assessment reports to provide historical information relative to the Bennett Lumber Products (aka Bennett Forest Industries) facility and the Junction Lodge near Elk City. The Bennett Lumber Products facility no longer exists, the mill closed, and all structures, equipment, etc. were removed approximately five years ago.

Two 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, a level 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 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 also located within 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.

The Revenue Prospect 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 and Junction Lodge wells. 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.

There is significant interaction between surface water and ground water systems, with the latter being more influent on the former. Field parameters and laboratory analyses indicated that

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.

Sediment sample RVAD1SD1 was 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 U.S. Department of Interior-Bureau of Land Management 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.

Sediment sample RVAD1SD1 was placed in a properly marked zip lock bag and then placed in a similarly marked cloth bag, and entered into the Chain-of-Custody form prior to shipping to SVL. Table 2. Revenue Prospect sediment sample analysis (in milligrams per kilogram [mg/kg]). summarizes laboratory analytical results for the sediment sample collected.

Table 2. Revenue Prospect sediment sample analysis (in milligrams per kilogram [mg/kg]).

Metals	IDTLs (mg/kg)	HHSLs (mg/kg)	Adit Mouth Sediment Sample RVAD1SD1 (mg/kg)
Antimony	4.77	31	5.6
Arsenic	0.391	23	6,310
Barium	896	1,600	817
Cadmium	1.35	39	1.26
Chromium	7.9	210	8.1
Copper	921	2,900	44.2
Iron	—	55,000	70,300
Lead	49.6	—	74.1
Manganese	223	3,600	601
Selenium	2.03	23	<4.0
Silver	0.189	390	18.7
Zinc	886	390	62.8
Mercury	0.00509	23	8.22

Note: **Orange** shaded values exceeded Idaho initial default target levels (IDTLs); **yellow** shaded values exceeded human health screening levels (HHSLs); and **pink** shaded values exceeded both IDTLs and HHSLs. Limits exceeded are indicated in **bold**.

The IDTLs were exceeded for antimony by 1.1 times, arsenic by 16,138 times, chromium by 1.02 times, lead by 1.49 times, manganese by 2.69 times, silver by 98.9 times, and mercury by 1,614 times. The HHSLs were exceeded for arsenic by 274 times and iron by 1.27 times.

The sediment sample had elevated metals where the adit opening had been cleaned out. The area where the drainage was discharging appeared to be stable and well vegetated at the time of the assessment. At the time of the assessment no pathways were observed for soil transport from the site.

Table 3 identifies when the results of the metals analysis exceeded the BLM benchmarks. As an example, The Revenue Prospect sediment sample RVAD1SD1 exceeded arsenic for all of the risk management criteria for the listed animals.

Table 3. Wildlife and livestock risk management criteria for metals in soils (all in milligrams per kilogram [mg/kg]).

Metals	Elk	Mule Deer	Deer Mine	Cottontail Rabbits	Canada Goose	Mallard	Robin	Cattle	Sheep	Median Values	RVAD1SD1
Antimony											5.6
Arsenic	328	200	230	438	61	116	4	419	275	275	6,310
Barium											817
Cadmium	3	3	7	6	2	1	0.3	15	12	8	1.26
Chromium											8.1
Copper	131	102	640	358	161	141	7	413	136	136	44.2
Iron											70,300
Lead	127	106	142	172	34	59	6	244	125	125	74.1
Manganese											601
Selenium											<4.0
Silver											18.7
Zinc	275	222	419	373	271	196	43	1,082	545	307	62.8
Mercury	11	11	2	15	6	4	1	45	8	8	8.22

Source: BLM 2004

Note: Shaded values indicate metals concentrations exceeded a BLM risk management criteria. Criteria exceeded are indicated in bold.

The values in this table assist in identifying the number of times a particular metal exceeds the BLM benchmarks. Arsenic exceeded the BLM benchmark for all animals listed with the least being the cottontail rabbit by 14.4 times and the greatest being the robin by 1,577 times. Although the value for arsenic is high relative to the robin, it is unlikely a robin exposure would occur due to the vegetation and debris covering the adit soil. Nevertheless, the property owner needs to be aware of the elevated arsenic levels for future consideration.

The remaining values are not remarkable for such a highly mineralized area such as the Elk City Mining District. It is unlikely human health risks or ecological health risks are associated with this area.

Task 2—Initial Site Evaluation

If information is not available to make a “yes” or “no” response below, further investigation may be needed. In these cases, the assessor should determine whether an APA is appropriate.

If the answer is “no” to any of questions 1, 2, or 3, proceed directly to task 3.	YES	NO
1. Does the site have a release or a potential to release?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Does the site have uncontained sources containing CERCLA-eligible substances?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Does the site have documented on-site, adjacent, or nearby targets?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the answers to questions 1, 2, and 3 above were all “yes,” then answer questions 4–7 before proceeding to task 3.	YES	NO
4. Does documentation indicate that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site?	<input type="checkbox"/>	<input type="checkbox"/>
5. Is there an apparent release at the site with no documentation of exposed targets, but targets are on site or immediately adjacent to the site?	<input type="checkbox"/>	<input type="checkbox"/>
6. Is there an apparent release and no documented on-site targets or targets immediately adjacent to the site, but targets are nearby (e.g., within 1 mile)?	<input type="checkbox"/>	<input type="checkbox"/>
7. Are there uncontained sources containing CERCLA hazardous substances, a potential to release with targets present on site or in proximity to the site, but no indication of a hazardous substance release?	<input type="checkbox"/>	<input type="checkbox"/>

Notes:

The Revenue Prospect is located near one residence which is 0.10 of a mile downstream of the site. No hazardous materials were evident during the site visit. Surface water sample results exceeded several Idaho surface water quality standards. These standards are discussed above in Task 1. However, human health risks or ecological health risks associated with this mine site discharge are unlikely as the discharge water goes subsurface into a large area before making contact with the American River. This area is well vegetated and does not show signs of plant stress.

During the site assessment, DEQ used references from several different documents, including United States Geological Survey (USGS) maps, county tax rolls, and historical reports. These documents often have different spellings for claim names, town sites, and/or geographic features. DEQ has retained the spelling from the original source document.

Table 4 parallels the questions above and should be used by the assessor to make decisions during task 3. Table 4 identifies different types of site information and provides some possible recommendations for further site assessment activities based on that information. The assessor should use Table 4 in determining the need for further action at the site, based on the answers to the questions in task 2. Assessors should use professional judgment when evaluating a site. An assessor’s individual judgment may be different from the general recommendations for a site given below.

Table 4. Site assessment decision guidelines for a site.

Suspected/Documented Site Conditions	EPA-Recommended Site Assessment Activities
1. There are no releases or potential to release.	APA
2. No uncontained sources with CERCLA-eligible substances are present on site.	APA
3. There are no on-site, adjacent, or nearby targets.	APA
4. There is documentation indicating that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site.	APA → SI or PA/SI
5. There is an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site.	APA → SI or PA/SI
6. There is an apparent release and no documented on-site targets and no documented targets immediately adjacent to the site, but there are nearby targets. Nearby targets are those targets that are located within 1 mile of the site and have a relatively high likelihood of exposure to a hazardous substance migration from the site.	Full PA
7. There is no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present on site or in proximity to the site.	Full PA

Task 3—DEQ Site Assessment Decision

When completing task 3, the assessor should use task 2 and Table 4 to select the appropriate decision. For example, if the answer to question 1 in task 2 was “no,” then an APA is appropriate and the “NRAP” box below should be checked. Additionally, if the answer to question 4 in task 2 is “yes,” then two options are available (as indicated in Table 4): (1) proceed with an APA and check the “Lower Priority SI” or “Higher Priority SI” box below or (2) proceed with a combined PA/SI.

Check the box that applies based on the conclusions of the APA checklist:

- No Remedial Action Planned (NRAP) Defer to NRC
- Higher Priority SI Refer to Removal Program
- Lower Priority SI Site is being addressed as part of another CERCLIS site
- Defer to RCRA Subtitle C Other: _____

DEQ Reviewer:



for

Daniel D. Stewart

December 24, 2012

Please explain the rationale for your decision:

A site inspection involving direct observations confirmed that contaminants of concern, including hazardous materials and petroleum products, do not exist in concentrations that present

a threat to human health or the environment. Although the Revenue Prospect is located near two occupied dwellings, no direct pathways exist to these dwellings. No hazardous materials or deleterious materials were evident during the site visit.

Results for surface water sample RVAD1SW1 for total recoverable metals indicated the sample exceeded several surface and ground water metals standards. The DEQ ground water standard for arsenic was exceeded by 8.3 times, iron by 38.6 times, and manganese by 8.3 times. The DEQ drinking water standard for arsenic was exceeded by 41.7 times, iron by 38.6 times, and manganese by 8.2 times. The DEQ cold water biota acute standard for arsenic was exceeded by 1.22 times. These values are not unusual for a highly mineralized area such as the Elk City Mining District.

Lush plant growth is occurring where the adit discharge goes subsurface which indicates no plant stress from the discharge.

The closest residence of the Revenue Prospect is approximately 0.10 of a mile downstream. One other residence exists across American River but upstream of the mine. When the adit does discharge water it goes subsurface into the American River alluvium. This water only discharges during the wet spring and the adit is dry during the summer and early fall. A metals analysis of the downstream residence drinking water would be advisable if the residence uses well water.

As a result of DEQ's research and observations, the department recommends an NRAP designation for the Revenue Prospect. Sections 2 through 5 provide further support for this determination.

However, if the site has a desired future beneficial use of residential or recreation home development, or should the mine be reopened, human health risks may be present and DEQ recommends that Mr. Scott prepares a risk management plan (RMP).

Section 2. Historical and Geologic Information

Numerous sources were used during desktop research prior to visiting the site. DEQ could not improve or expand upon these reports by writing additional historical or geological text, so they are directly quoted below.

Mine History: Flagg (1913) described the Revenue Prospect as follows:

Though Elk City is primarily a gold district and all the prospecting has been done for gold, it is not improbable that some silver ores of commercial importance will be developed. The most promising indication is a wide vein on the Revenue property, formerly known as the California. The vein extends from a point south of Gold Hill placer on the east bank of Red River, eastward to the American River. Openings have been made at several places along the vein, the most important of which are tunnels driven in opposite direction from the two rivers named. This vein has the same dip and strike common to the district, though it varies somewhat in structure. The vein filling is firm white quartz carrying some argentite and galena with variable quantities of stibnite. At the western extremity of the vein the stibnite predominates: the silver values are low and gold is a negligible quantity. In the tunnel running from American River the silver values are higher, the gold values increase materially and there is less antimony. The vein, which varies greatly in width, seems to have been formed on the foot wall of a highly sheared, medium grained granite dike. In the most westerly tunnel the sheared condition of the granite dike is most plainly seen and here the granite also is more or less impregnated with stibnite in microscopic crystals. The

presence of antimony makes this ore undesirable, though there are some indications of high grade silver ores low in antimony on the eastern half the property which may prove to be of commercial importance.

One other occurrence of stibnite was noted in Deadwood Canyon. With the site is associated a small amount of galena, and the ore is said to be high in silver. While interesting from a scientific point of view, it is probable that the occurrence will never of commercial importance. Monzonite sands were almost always found in connection with the placer gold and other metals more or less rare are reported from the district, but at best they are small deposit of little or no importance.

Geologic Features: The following is the description of the Elk City Mining District which includes the Revenue Prospect from Flagg (1913):

The Elk City district, lying in the western foot hills of the rugged Bitter Root mountains, is a region of low hills of moderate elevation, perhaps in part the remnant of an old plateau of the original features are more or less obscured by the complicated system of ridges and canons. For the most part the surface is covered to considerable depth with drift, composed chiefly of interstratified clays and gravels with few large boulders. The soil covering is moderately deep, subject to wide variation. In some of the placer diggings, notable at Buffalo hill, pot holes are found along the axis of old river channels in the bed rock, and cobbles of conservable size are not infrequently found imbedded in the decomposing gneiss, a condition to be attributed to the weight of superimposed gravels rather than the direct evidence of glacial action, as has been suggested.

The formation of the district is almost entirely granite and schistose gneiss, together with more highly metamorphic schists which perhaps are of sedimentary origin. All transition phases of granitic rocks are often seen close together in small areas. The prevailing rock is light colored biotite gneiss which is evidently derived from granite. Excessive dynamo metamorphic stresses have developed fine grained, dark colored phases tending towards schists. The dip as a rule is low, but subject to wide variations. The gneiss is often highly contorted and crumpled perpendicularly to the strike. The essential constituents of the gneiss are orthoclase, oligoclase (plagioclase rarely), abundance quartz, and varying quantities of biotite and muscovite. Lenticular crystals of orthoclase surrounded by narrow, dark rims of biotite have been developed, giving the gneiss an ocellar structure.

Everywhere the gneiss is cut by dikes of various widths. While there is a wide difference in the structure among these dikes, they seem to be essentially of the same composition. Narrow aplite dikes cut the gneiss parallel to the schistosity, while others, identical in form and composition, cross the formation. Large dikes of pegmatite, often greatly sheared, are also found. In some areas where excessive compression has developed a fine grained, highly schistose structure characterized by sinuous bands of biotite and muscovite, an incipient gneissoid structure is noted in the dikes.

Section 3. Site Conditions and Photographs

On May 29, 2012 the Revenue Prospect was visited by Tina Elayer, Dennis Behler, and Daniel Stewart from the Idaho DEQ. Mr. Allen Scott, the property owner, was present as well.

The Revenue Prospect was last worked during the 1980's. During that time the front of the mine area was cleared and a holding pond was constructed. This pond no longer exists. During the site visit approximately 1-2 gallons of water was discharging from the adit mouth. This water only discharges during the wet spring and the adit is dry during the summer and early fall. The adit water goes subsurface prior to reaching the American River, which is approximately 30 meters east of the mine. The adit water is diverted to the southeast into an area that is well vegetated with healthy, vigorous vegetation such as 25-30 foot lodge pole pine.

The Revenue Prospect consists of a tunnel approximately 800 feet in length. The tunnel goes through granite for the initial 300 feet and then through clay like material (Allen Scott, 2012). The surrounding area has been logged several times in the past. At the time of the assessment there was evidence of clearing and logging in the area to assist in wildfire prevention to protect the city of Elk City.

All-terrain vehicle (ATV) tracks were observed at the mine and in the general vicinity. A fire ring was noted near the mine indicating recreational/hunting activity. The mine is separated from the Red River by geology, that being a ridge between the mine and Red River.

No equipment, mining related material, hazardous materials, or petroleum based products are at the mine site. During the visit the adit was open. This was discussed with Mr. Scott and he intends to restrict access to the mine tunnel.

All of the Revenue Prospect photographs in this section were taken by DEQ on May 29, 2012.

Photo 1 shows the open adit on the Revenue Prospect. During the site visit approximately 1 to 2 gallons of water was discharging from the adit mouth. The water is diverted southeast and goes subsurface into a heavily vegetated area.



Photo 1. Revenue Prospect open adit.

Photo 2 shows the well vegetated adit drainage area. The adit water only flows in the wet spring time and the drainage goes subsurface in this area. It is dry during the summer.



Photo 2. Revenue Prospect adit drainage area.

Photo 3 shows the disturbed area and woody debris placed to cover and stabilize the area. The mouth of the adit area was cleaned out for better access. Note the apparently healthy grass and vegetation growing amongst the woody debris.



Photo 3. Woody debris covering and stabilizing the disturbed area near the Revenue Prospect adit.

Photo 4 is looking across the American River from the Revenue Prospect side of the river. The river is 30 meters from the adit.



Photo 4. American River near the Revenue Prospect.

Photo 5 shows logging slash piles in the immediate vicinity of the Revenue Prospect. At the time of DEQ's assessment the vegetation in this area was being thinned and logged to provide wild-fire control for the City of Elk City. The city is approximately one mile northeast of the mine site.



Photo 5. Logging slash piles near the Revenue Prospect.

Section 4. Maps



Figure 1. Location of the Revenue Prospect in Idaho County, Idaho.

(Source: USGS 100K quads)



Figure 2. Map of major lithology in the vicinity of the Revenue Prospect.

(Source: SDE Feature Class, USGS 1995. Idaho GIS ArcSDE 9.2 Geodatabase)

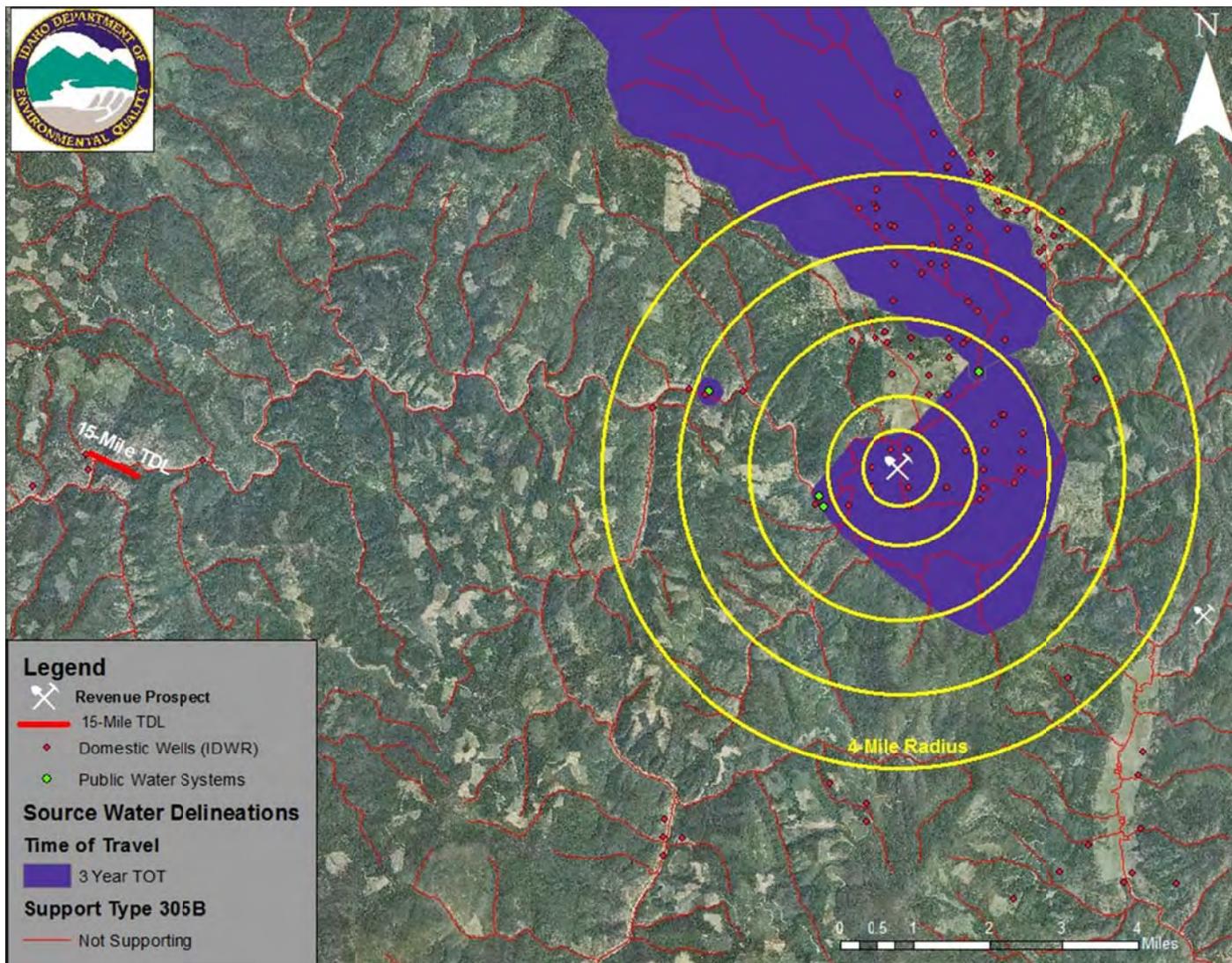


Figure 3. Domestic well and public water system locations.

There are approximately 72 domestic well locations and four public water systems within the 4-mile radius, 15-mile TDL. There are not significant wetlands within a 2-mile radius or in the general area. Sensitive streams located in the vicinity of the Revenue Prospect are also shown (indicated as “not supporting”).

(Source: Idaho GIS ArcSDE 9.3 Geodatabase, National Agricultural Imagery Program 2004)

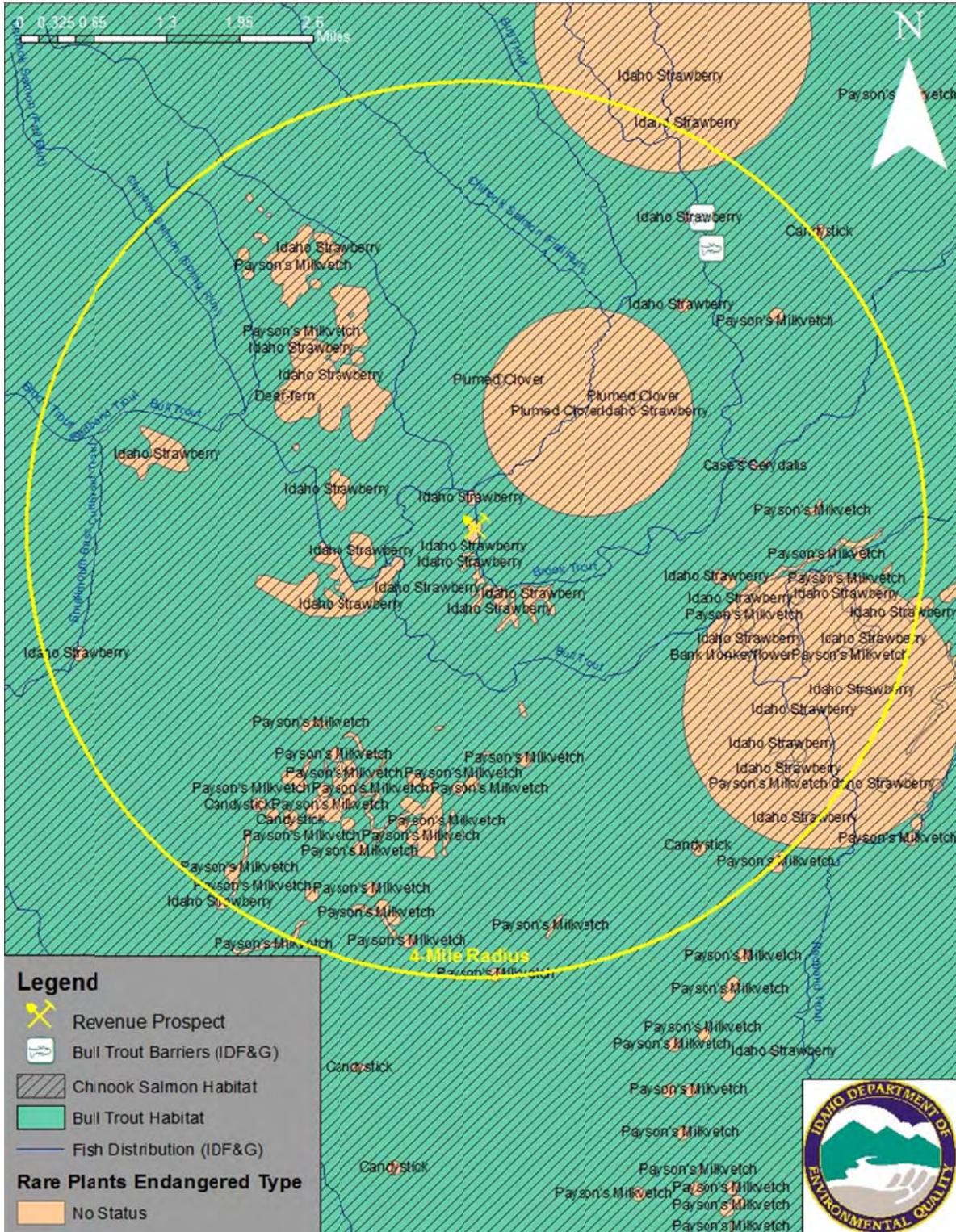


Figure 4. Plant and fishery sensitive species within 4-mile radius and surrounding area of the Revenue Prospect.

(Source: SDE Feature Dataset, Animal Conservation Database. Idaho GIS ArcSDE 9.2 Geodatabase)

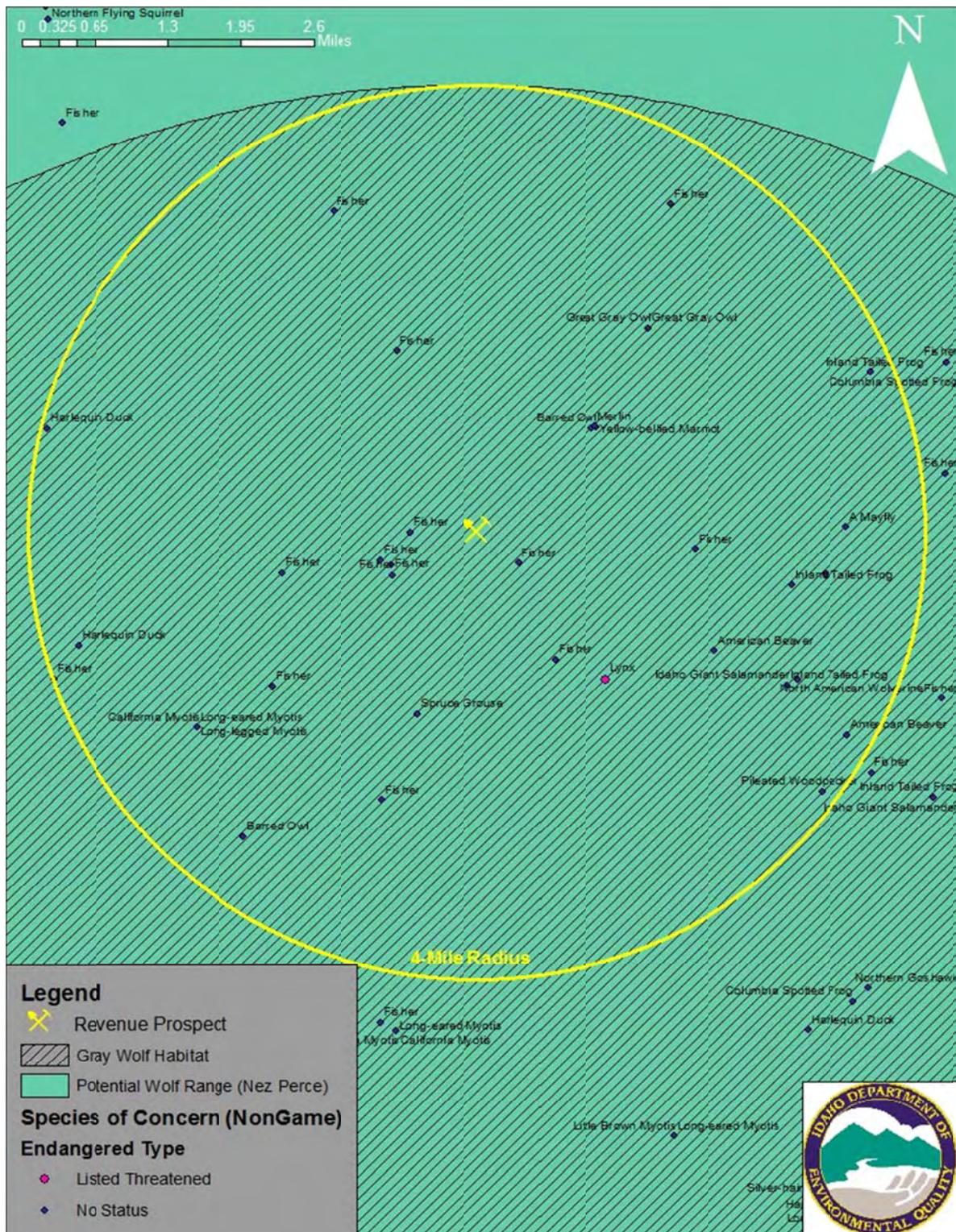


Figure 5. Nongame, sensitive species, and recently delisted wolf within 4-mile radius and surrounding area of the Revenue Prospect.

(Source: SDE Feature Dataset, Animal Conservation Database. Idaho GIS ArcSDE 9.2 Geodatabase)

Section 5. References

- BLM (US Bureau of Land Management). 2004. *Risk Management Criteria for Metals at BLM Mining Sites*. Denver, CO: BLM, National Science and Technology Center. Technical Note 390. BLM/RS/ST-97/001 + 1703.
- BLM (US Bureau of Land Management). 2011. *Land Patent Details—BLM GLO Records*. Available at:
- DEQ (Idaho Department of Environmental Quality). 2002. Junction Lodge (PWS No. 2250030) Source Water Assessment. Boise, ID: DEQ.
- DEQ (Idaho Department of Environmental Quality). 2011. *Idaho's 2010 Integrated Report*. Boise, ID: DEQ. Available at:
<http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report.aspx#2012-IR>.
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- Flagg, A.L. 1913. *The Elk City Mining District, Idaho County, Idaho*. Trans. Am. Institute Mining Engineers, v. 45, p. 113-122.
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GIS Coverages

- Animal Conservation Database. Using: ArcMap GIS. Version 10. Redlands, CA: Environmental Systems Research Institute, Inc., 1992–1999.
- IDFG (Idaho Department of Fish and Game). 2002. Fisheries information GIS layer.
- IDWR (Idaho Department of Water Resources). 1997. COVERAGE IDOWN—Idaho Surface Ownership.
- IDWR (Idaho Department of Water Resources). 2010. GIS shapefile of well database.
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- NAIP (National Agricultural Imagery Program). 2009. Using: ArcMap GIS. Version 10. Redlands, CA: Environmental Systems Research Institute, Inc., 1992–1999.
- USGS (US Geological Society). 100K Quad Map. Using: ArcMap GIS. Version 10. Redlands, CA: Environmental Systems Research Institute, Inc., 1992-1999.

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Appendix A. Laboratory Sample Reports



CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

Page 1 of 1

W2E0812
FOR SVL USE ONLY
SVL JOB #

TEMP on Receipt: 9.1°
Table 1 -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinseate, 5 = Oil
6 = Waste, 7 = Other

Report to Company: DEQ
 Contact: Tina Klayer
 Address: 1410 N. Hilton
BASE RD.
 Phone Number: 208-373-0563
 FAX Number: _____
 E-mail: Tina.klayer@deq.idaho.gov

Invoice Sent To: Same
 Contact: _____
 Address: _____
 Phone Number: _____
 FAX Number: _____
 PO#: _____

Project Name: Revenue Prospect
Sampler's Signature: [Signature]

Indicate State of sample origination: _____

USACE? Yes No

Sample ID	Collection		Matrix Type (From Table 1)	Misc.	Preservative(s)	Other (Specify)	Analyses Required	Rush Instructions (Days)	Comments
	Date	Time							
1 RV AD1 SD1	5/20/12	15:22	3				PCPA Cu Zn Mn SB Fe		Sea mussels to be stored + dried
2 RV AD1 SW1	5/20/12	15:22	1						Total s on water
3									
4									
5									
6									
7									
8									
9									
10									

Date: 5/31/12 Time: 8:45

Received by: [Signature]

Date: 5/31/12 Time: 4:50 AM

Retinquired by: [Signature]

* Sample Reject: Return Dispose Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

* SVL WILL PRESERVE FOR ANALYSIS OF 5/31/12

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: 5/31/12
 SVL Work No: W2E0812

By: UP Seery

Item	Description	V	VC	NV	NA	Comments
1	Client or project name	✓				+ DEQ
2	Date and time of receipt at lab	✓				5/31/12 8:45
3	Received by	✓				C. FLORES
4	Temperature blank or cooler temperature	Q6				Temp. 9.1 °C.
5	Were the sample(s) received on ice				✓	
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	✓				SVL WILL PRESERVE FOR ANALYSIS
13	Type of container for each sample / volume received	✓				
14	Analysis requested for each sample	✓				
15	Sample matrix description	✓				
16	COC properly completed & legible	✓				
17	Corrections properly made (initials & date)				✓	
18	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)				✓	
19	Shipper's air bill				✓	WALK-N

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

Additional Comments: _____



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

Project Name: Boise
Work Order: **W2E0812**
Reported: 14-Jun-12 14:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
RVAD1SD1	W2E0812-01	Soil	29-May-12 15:22	DB	31-May-2012
RVAD1SW1	W2E0812-02	Surface Water	29-May-12 15:22	DB	31-May-2012

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: 9.1°C)

<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>	<u>Labnumber</u>	<u>Container</u>	<u>Client ID</u>
W2E0812-01 A	Bag, Ziploc	RVAD1SD1	W2E0812-01 B	Manila 80-Sieve	RVAD1SD1



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: **W2E0812**
Reported: 14-Jun-12 14:40

Client Sample ID: **RVAD1SD1**
SVL Sample ID: **W2E0812-01 (Soil)**

Sampled: 29-May-12 15:22
Received: 31-May-12
Sampled By: DB

Sample Report Page 1 of 1

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	5.6	mg/kg	2.0	0.7		W223010	AS	06/12/12 18:43	
EPA 6010B	Arsenic	6310	mg/kg	25.0	7.5	10	W223010	AS	06/12/12 19:35	D2
EPA 6010B	Barium	817	mg/kg	0.200	0.019		W223010	AS	06/12/12 18:43	
EPA 6010B	Cadmium	1.26	mg/kg	0.20	0.04		W223010	AS	06/12/12 18:43	
EPA 6010B	Chromium	8.10	mg/kg	0.60	0.13		W223010	AS	06/12/12 18:43	
EPA 6010B	Copper	44.2	mg/kg	1.00	0.29		W223010	AS	06/12/12 18:43	
EPA 6010B	Iron	70300	mg/kg	6.0	1.9		W223010	AS	06/12/12 18:43	
EPA 6010B	Lead	74.1	mg/kg	0.75	0.35		W223010	AS	06/12/12 18:43	
EPA 6010B	Manganese	601	mg/kg	0.40	0.09		W223010	AS	06/12/12 18:43	
EPA 6010B	Selenium	< 4.0	mg/kg	4.0	1.5		W223010	AS	06/12/12 18:43	
EPA 6010B	Silver	18.7	mg/kg	0.50	0.05		W223010	AS	06/12/12 18:43	
EPA 6010B	Zinc	62.8	mg/kg	1.00	0.21		W223010	AS	06/12/12 18:43	
EPA 7471A	Mercury	8.22	mg/kg	0.330	0.080	10	W224108	DJA	06/13/12 10:56	D2

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

John Kern
Laboratory Director



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

Project Name: Boise
Work Order: **W2E0812**
Reported: 14-Jun-12 14:40

Client Sample ID: **RVAD1SW1**

SVL Sample ID: **W2E0812-02 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 29-May-12 15:22
Received: 31-May-12
Sampled By: DB

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total)										
EPA 7470A	Mercury	0.00138	mg/L	0.00020	0.000054		W224168	DJA	06/13/12 18:01	
Metals (Total Recoverable)										
EPA 6010B	Antimony	< 0.020	mg/L	0.020	0.009		W224201	DT	06/14/12 12:21	
EPA 6010B	Arsenic	0.417	mg/L	0.025	0.007		W224201	DT	06/14/12 12:21	
EPA 6010B	Barium	0.0970	mg/L	0.0020	0.0006		W224201	DT	06/14/12 12:21	
EPA 6010B	Cadmium	< 0.0020	mg/L	0.0020	0.0006		W224201	DT	06/14/12 12:21	
EPA 6010B	Chromium	< 0.0060	mg/L	0.0060	0.0015		W224201	DT	06/14/12 12:21	
EPA 6010B	Copper	< 0.010	mg/L	0.010	0.003		W224201	DT	06/14/12 12:21	
EPA 6010B	Iron	11.6	mg/L	0.060	0.022		W224201	DT	06/14/12 12:21	
EPA 6010B	Lead	< 0.0075	mg/L	0.0075	0.0027		W224201	DT	06/14/12 12:21	
EPA 6010B	Manganese	0.416	mg/L	0.0040	0.0014		W224201	DT	06/14/12 12:21	
EPA 6010B	Selenium	< 0.040	mg/L	0.040	0.013		W224201	DT	06/14/12 12:21	
EPA 6010B	Silver	< 0.0050	mg/L	0.0050	0.0014		W224201	DT	06/14/12 12:21	
EPA 6010B	Zinc	0.0266	mg/L	0.0100	0.0026		W224201	DT	06/14/12 12:21	

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

John Kern
Laboratory Director



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

Project Name: Boise
Work Order: **W2E0812**
Reported: 14-Jun-12 14:40

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	0.000054	0.00020	W224168	13-Jun-12	
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	<2.0	0.7	2.0	W223010	12-Jun-12	
EPA 6010B	Arsenic	mg/kg	<2.5	0.8	2.5	W223010	12-Jun-12	
EPA 6010B	Barium	mg/kg	<0.200	0.019	0.200	W223010	12-Jun-12	
EPA 6010B	Cadmium	mg/kg	<0.20	0.04	0.20	W223010	12-Jun-12	
EPA 6010B	Chromium	mg/kg	<0.60	0.13	0.60	W223010	12-Jun-12	
EPA 6010B	Copper	mg/kg	<1.00	0.29	1.00	W223010	12-Jun-12	
EPA 6010B	Iron	mg/kg	<6.0	1.9	6.0	W223010	12-Jun-12	
EPA 6010B	Lead	mg/kg	<0.75	0.35	0.75	W223010	12-Jun-12	
EPA 6010B	Manganese	mg/kg	<0.40	0.09	0.40	W223010	12-Jun-12	
EPA 6010B	Selenium	mg/kg	<4.0	1.5	4.0	W223010	12-Jun-12	
EPA 6010B	Silver	mg/kg	<0.50	0.05	0.50	W223010	12-Jun-12	
EPA 6010B	Zinc	mg/kg	<1.00	0.21	1.00	W223010	12-Jun-12	
EPA 7471A	Mercury	mg/kg	<0.033	0.008	0.033	W224108	13-Jun-12	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	<0.020	0.009	0.020	W224201	14-Jun-12	
EPA 6010B	Arsenic	mg/L	<0.025	0.007	0.025	W224201	14-Jun-12	
EPA 6010B	Barium	mg/L	<0.0020	0.0006	0.0020	W224201	14-Jun-12	
EPA 6010B	Cadmium	mg/L	<0.0020	0.0006	0.0020	W224201	14-Jun-12	
EPA 6010B	Chromium	mg/L	<0.0060	0.0015	0.0060	W224201	14-Jun-12	
EPA 6010B	Copper	mg/L	<0.010	0.003	0.010	W224201	14-Jun-12	
EPA 6010B	Iron	mg/L	<0.060	0.022	0.060	W224201	14-Jun-12	
EPA 6010B	Lead	mg/L	<0.0075	0.0027	0.0075	W224201	14-Jun-12	
EPA 6010B	Manganese	mg/L	<0.0040	0.0014	0.0040	W224201	14-Jun-12	
EPA 6010B	Selenium	mg/L	<0.040	0.013	0.040	W224201	14-Jun-12	
EPA 6010B	Silver	mg/L	<0.0050	0.0014	0.0050	W224201	14-Jun-12	
EPA 6010B	Zinc	mg/L	<0.0100	0.0026	0.0100	W224201	14-Jun-12	

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	0.00550	0.00500	110	80 - 120	W224168	13-Jun-12	
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	85.0	100	85.0	80 - 120	W223010	12-Jun-12	
EPA 6010B	Arsenic	mg/kg	86.8	100	86.8	80 - 120	W223010	12-Jun-12	
EPA 6010B	Barium	mg/kg	93.9	100	93.9	80 - 120	W223010	12-Jun-12	
EPA 6010B	Cadmium	mg/kg	86.9	100	86.9	80 - 120	W223010	12-Jun-12	
EPA 6010B	Chromium	mg/kg	91.0	100	91.0	80 - 120	W223010	12-Jun-12	
EPA 6010B	Copper	mg/kg	91.8	100	91.8	80 - 120	W223010	12-Jun-12	
EPA 6010B	Iron	mg/kg	927	1000	92.7	80 - 120	W223010	12-Jun-12	
EPA 6010B	Lead	mg/kg	87.7	100	87.7	80 - 120	W223010	12-Jun-12	
EPA 6010B	Manganese	mg/kg	89.4	100	89.4	80 - 120	W223010	12-Jun-12	
EPA 6010B	Selenium	mg/kg	81.1	100	81.1	80 - 120	W223010	12-Jun-12	
EPA 6010B	Silver	mg/kg	4.63	5.00	92.6	80 - 120	W223010	12-Jun-12	
EPA 6010B	Zinc	mg/kg	85.4	100	85.4	80 - 120	W223010	12-Jun-12	
EPA 7471A	Mercury	mg/kg	0.875	0.833	105	80 - 120	W224108	13-Jun-12	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	1.01	1.00	101	80 - 120	W224201	14-Jun-12	
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SVL holds the following certifications:

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



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

Project Name: Boise
Work Order: **W2E0812**
Reported: 14-Jun-12 14:40

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	W224201	14-Jun-12	
EPA 6010B	Barium	mg/L	0.982	1.00	98.2	80 - 120	W224201	14-Jun-12	
EPA 6010B	Cadmium	mg/L	1.01	1.00	101	80 - 120	W224201	14-Jun-12	
EPA 6010B	Chromium	mg/L	1.05	1.00	105	80 - 120	W224201	14-Jun-12	
EPA 6010B	Copper	mg/L	1.00	1.00	100	80 - 120	W224201	14-Jun-12	
EPA 6010B	Iron	mg/L	9.95	10.0	99.5	80 - 120	W224201	14-Jun-12	
EPA 6010B	Lead	mg/L	1.01	1.00	101	80 - 120	W224201	14-Jun-12	
EPA 6010B	Manganese	mg/L	1.02	1.00	102	80 - 120	W224201	14-Jun-12	
EPA 6010B	Selenium	mg/L	1.02	1.00	102	80 - 120	W224201	14-Jun-12	
EPA 6010B	Silver	mg/L	0.0518	0.0500	104	80 - 120	W224201	14-Jun-12	
EPA 6010B	Zinc	mg/L	0.974	1.00	97.4	80 - 120	W224201	14-Jun-12	

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
EPA 7470A	Mercury	mg/L	28.9	27.3	0.00100	R > 4S	75 - 125	W224168	13-Jun-12	D2,M3
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010B	Antimony	mg/kg	37.8	5.6	100	32.2	75 - 125	W223010	12-Jun-12	M2
EPA 6010B	Arsenic	mg/kg	6400	6310	100	86.7	75 - 125	W223010	12-Jun-12	D2,M3
EPA 6010B	Barium	mg/kg	883	817	100	R > 4S	75 - 125	W223010	12-Jun-12	M2
EPA 6010B	Cadmium	mg/kg	92.2	1.26	100	90.9	75 - 125	W223010	12-Jun-12	
EPA 6010B	Chromium	mg/kg	106	8.10	100	98.1	75 - 125	W223010	12-Jun-12	
EPA 6010B	Copper	mg/kg	155	44.2	100	110	75 - 125	W223010	12-Jun-12	
EPA 6010B	Iron	mg/kg	71700	70300	1000	R > 4S	75 - 125	W223010	12-Jun-12	M3
EPA 6010B	Lead	mg/kg	165	74.1	100	90.6	75 - 125	W223010	12-Jun-12	
EPA 6010B	Manganese	mg/kg	677	601	100	76.1	75 - 125	W223010	12-Jun-12	M3
EPA 6010B	Selenium	mg/kg	87.6	<4.0	100	84.0	75 - 125	W223010	12-Jun-12	
EPA 6010B	Silver	mg/kg	30.8	18.7	5.00	241	75 - 125	W223010	12-Jun-12	M1
EPA 6010B	Zinc	mg/kg	161	62.8	100	98.2	75 - 125	W223010	12-Jun-12	
EPA 7471A	Mercury	mg/kg	0.182	<0.033	0.167	96.0	75 - 125	W224108	13-Jun-12	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	1.03	<0.020	1.00	103	75 - 125	W224201	14-Jun-12	
EPA 6010B	Arsenic	mg/L	1.43	0.417	1.00	101	75 - 125	W224201	14-Jun-12	
EPA 6010B	Barium	mg/L	1.08	0.0970	1.00	98.6	75 - 125	W224201	14-Jun-12	
EPA 6010B	Cadmium	mg/L	1.02	<0.0020	1.00	102	75 - 125	W224201	14-Jun-12	
EPA 6010B	Chromium	mg/L	1.06	<0.0060	1.00	106	75 - 125	W224201	14-Jun-12	
EPA 6010B	Copper	mg/L	1.03	<0.010	1.00	102	75 - 125	W224201	14-Jun-12	
EPA 6010B	Iron	mg/L	21.3	11.6	10.0	97.2	75 - 125	W224201	14-Jun-12	
EPA 6010B	Lead	mg/L	1.01	<0.0075	1.00	101	75 - 125	W224201	14-Jun-12	
EPA 6010B	Manganese	mg/L	1.36	0.416	1.00	94.3	75 - 125	W224201	14-Jun-12	
EPA 6010B	Selenium	mg/L	1.03	<0.040	1.00	103	75 - 125	W224201	14-Jun-12	
EPA 6010B	Silver	mg/L	0.0531	<0.0050	0.0500	106	75 - 125	W224201	14-Jun-12	
EPA 6010B	Zinc	mg/L	1.00	0.0266	1.00	97.8	75 - 125	W224201	14-Jun-12	



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

Project Name: Boise
Work Order: **W2E0812**
Reported: 14-Jun-12 14:40

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	29.5	28.9	0.00100	2.1	20	W224168	13-Jun-12	D2,M3
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Metals (Total) by EPA 6000/7000 Methods

EPA 6010B	Antimony	mg/kg	37.6	37.8	100	0.6	20	W223010	12-Jun-12	
EPA 6010B	Arsenic	mg/kg	6670	6400	100	4.1	20	W223010	12-Jun-12	D2
EPA 6010B	Barium	mg/kg	906	883	100	2.6	20	W223010	12-Jun-12	
EPA 6010B	Cadmium	mg/kg	93.8	92.2	100	1.8	20	W223010	12-Jun-12	
EPA 6010B	Chromium	mg/kg	108	106	100	1.3	20	W223010	12-Jun-12	
EPA 6010B	Copper	mg/kg	158	155	100	2.0	20	W223010	12-Jun-12	
EPA 6010B	Iron	mg/kg	76300	71700	1000	6.3	20	W223010	12-Jun-12	
EPA 6010B	Lead	mg/kg	172	165	100	4.3	20	W223010	12-Jun-12	
EPA 6010B	Manganese	mg/kg	731	677	100	7.6	20	W223010	12-Jun-12	
EPA 6010B	Selenium	mg/kg	89.2	87.6	100	1.9	20	W223010	12-Jun-12	
EPA 6010B	Silver	mg/kg	30.0	30.8	5.00	2.4	20	W223010	12-Jun-12	
EPA 6010B	Zinc	mg/kg	160	161	100	0.6	20	W223010	12-Jun-12	
EPA 7471A	Mercury	mg/kg	0.197	0.182	0.167	7.9	20	W224108	13-Jun-12	

Metals (Total Recoverable)

EPA 6010B	Antimony	mg/L	1.02	1.03	1.00	1.1	20	W224201	14-Jun-12	
EPA 6010B	Arsenic	mg/L	1.42	1.43	1.00	0.7	20	W224201	14-Jun-12	
EPA 6010B	Barium	mg/L	1.07	1.08	1.00	1.1	20	W224201	14-Jun-12	
EPA 6010B	Cadmium	mg/L	1.01	1.02	1.00	1.4	20	W224201	14-Jun-12	
EPA 6010B	Chromium	mg/L	1.05	1.06	1.00	1.4	20	W224201	14-Jun-12	
EPA 6010B	Copper	mg/L	1.01	1.03	1.00	1.5	20	W224201	14-Jun-12	
EPA 6010B	Iron	mg/L	21.4	21.3	10.0	0.3	20	W224201	14-Jun-12	
EPA 6010B	Lead	mg/L	0.999	1.01	1.00	1.0	20	W224201	14-Jun-12	
EPA 6010B	Manganese	mg/L	1.34	1.36	1.00	1.2	20	W224201	14-Jun-12	
EPA 6010B	Selenium	mg/L	1.02	1.03	1.00	0.6	20	W224201	14-Jun-12	
EPA 6010B	Silver	mg/L	0.0528	0.0531	0.0500	0.6	20	W224201	14-Jun-12	
EPA 6010B	Zinc	mg/L	0.993	1.00	1.00	1.2	20	W224201	14-Jun-12	

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/kg	88.5	5.6	100	82.9	75 - 125	W223010	12-Jun-12	
EPA 6010B	Barium	mg/kg	871	817	100	54.5	75 - 125	W223010	12-Jun-12	M2
EPA 6010B	Silver	mg/kg	22.6	18.7	5.00	78.2	75 - 125	W223010	12-Jun-12	



IDEQ (Boise) 1410 N. Hilton Boise, ID 83706	Project Name: Boise Work Order: W2E0812 Reported: 14-Jun-12 14:40
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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
