Supplemental Site Inspection Report for the Gilmore Division of the Texas Mining District

Lemhi County

State of Idaho
Department of Environmental Quality

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Acknowledgments

DEQ would like to thank Dorothy Canada and the Canada family for permitting access to their property near Gilmore, Idaho.

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amsl	above mean sea level
ATV	all-terrain vehicle
BLM	U.S. Bureau of Land Management
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
EPA	United States Environmental Protection Agency
FSP	Field Sampling Plan
GIS	geographic information system
IDHW	Idaho Department of Health and Welfare
IDL	Idaho Department of Lands
IDWR	Idaho Department of Water Resources
IGS	Idaho Geological Survey
mg/kg	milligrams per kilogram
MRDS	Mineral Resource Data System
NRAP	No Remedial Action Planned
PA	preliminary assessment
PPE	probable point of entry
PWS	public water system
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RPD	relative percent difference
RSLs	regional screening levels
SI	site inspection
SVL	SVL Analytical, Inc.
SWA	source water assessment
TDL	target distance limit
TMDL	total maximum daily load
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WRCC	Western Regional Climate Center

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1 Introduction

This report presents supplemental site inspection (SI) results for mine sites visited during 2015 within the Gilmore Division of the Texas Mining District in Lemhi County, Idaho. A Preliminary Assessment (PA)/SI was initially conducted in 2010 for mine sites where access was granted to DEQ. Results are summarized in the *Gilmore Division of the Texas Mining District Preliminary Assessment and Site Inspection Report* (DEQ 2011). During 2014, access was granted to additional mine sites in this area; therefore, this supplemental SI includes results for these additional sites.

Under a cooperative agreement with the United States Environmental Protection Agency (EPA) Region 10, the Idaho Department of Environmental Quality (DEQ) provides technical support for performing the PA/SI process at various mine and industrial sites located on private, state, or mixed ownership (public and private) lands. Additional information about DEQ's PA program can be found at: *http://www.deq.idaho.gov/preliminary-assessments*.

DEQ initiated the PA program in February 2002 to prioritize and assess 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 can be cost-effectively assessed on a watershed basis.

Mine sites assessed in 2010 within the Gilmore Division of the Texas Mining District were given designations of "No Remedial Action Planned" (NRAP) with recommendations to close or manage openings that pose significant physical dangers and to restrict public access (DEQ 2011). The purpose of this Supplemental SI is to assess the threat posed to human health and the environment and to determine the need for additional investigation for sites that were not previously visited.

This Supplemental SI is presented in the following sections:

- Section 2, **Site Description**, compiles desktop research information to present the location, ownership, general geology, and climatology for the site. Desktop research also includes compiling the operational history of past mining activities, and current and potential future land uses.
- Section 3, **Sample Collection and Analysis**, describes and provides photos for the sites visited and sampling locations and also presents the analytical results.
- Section 4, **Migration/Exposure Pathways and Targets**, presents observations and potential targets for the surface water pathway, soil exposures, ground water pathway, and air pathway.
- Section 5, **Conclusions and Recommendations**, presents a summary of the SI results and recommendations based on the current conditions of the mine sites.

2 Site Description

The site description includes the following information: location and ownership (Section 2.1), general geology (Section 2.2), climatology (Section 2.3), operational history of past mining activities (Section 2.4), and current and potential future land uses (Section 2.5). As part of the desktop research, DEQ uses references from historic reports which often have different spellings for claim names, townsites, and/or geographic features. DEQ retains the spelling and usage from the original source documents.

2.1 Location and Ownership

The Gilmore Division of the Texas Mining District is located in Lemhi County, Idaho (Figure 1). The claims within this district are located at an approximate altitude of 7,500 feet above mean sea level (amsl; USGS 2015) and about one half mile west of Gilmore, Idaho in Section 18 of Township 13 North, Range 27 East of the Boise Meridian. A summary of ownership and status based on the previous PA/SI and results of this Supplemental SI is included in Table 1 with locations shown in Figure 2.

Within Table 1, "**Status**" identifies DEQ's assessment recommendation relative to current human health and environmental risks. "**No Remedial Action Planned (NRAP)**" is designated for sites where DEQ did not find any significant evidence indicating the potential of adverse toxicological effects to human or ecological receptors. "**Additional Actions Recommended**" is designated for sites where DEQ recommends additional site investigations and/or remedial actions are necessary to prevent adverse effects to human or ecological receptors. Information included in this report or the previous PA/SI report (DEQ 2011) supports the status identified in Table 1 for each site.

To access the various claims, take Highway 28 south from Leadore, Idaho for approximately 18 miles. Turn right on Gilmore Road (aka Nfd-002 and Meadow Lake Road) and go past the old Gilmore Mercantile to continue on the road toward Meadow Lake Campground. The various claims are located along the road. Sampling for this assessment was conducted on private property owned by the Canada family. DEQ does not warrant the ownership research or location of property boundaries contained in this report. Information regarding ownership and property boundaries was obtained from the parcel maps for Lemhi County (Idaho State Tax Commission, 2015).

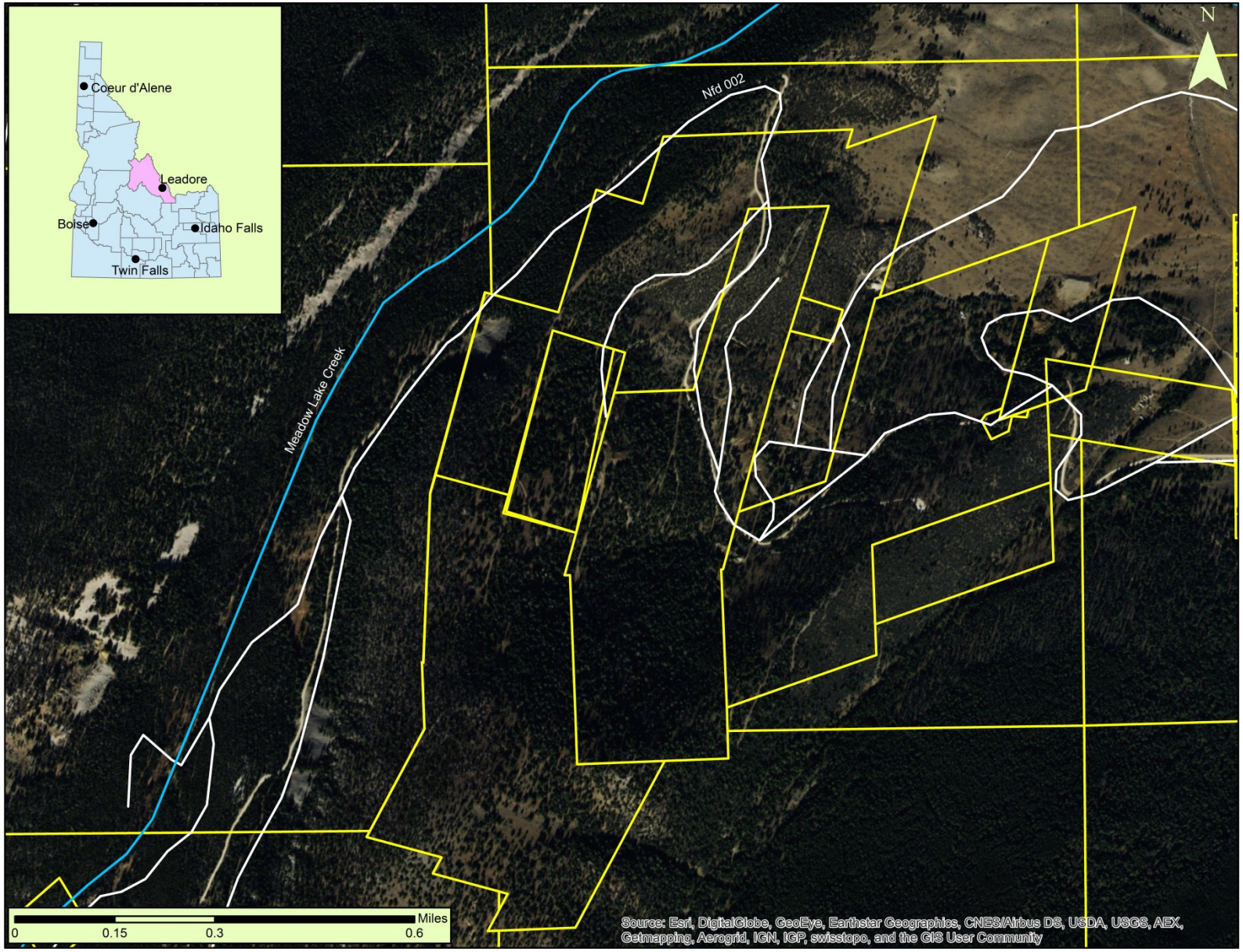

Figure 1. Aerial overview map of the Gilmore Division of the Texas Mining District site with parcel boundaries outlined in yellow. See Figure 2 for ownership information.

Table 1. Gilmore Division of the Texas Mining District Ownership.

Parcel No.	Owner	Mines/Claims	AKAs	Status[a]
RP99000020015F	Harold L. Canada Family Trust			No mines/claims on this parcel. According to Lemhi County, this parcel is now part of RP99000020015H.
RP990000200090	Harold L. Canada Family Trust			No mines/claims on this parcel.
RP990000200040	Harold L. Canada Family Trust	Hatton Patented Claim		NRAP in 2010
		Edie Patented Claim		NRAP in 2010
		W.H. Cannon Patented Claim		NRAP in 2010
		Gilmore Patented Claim (including Little Gilmore Tunnel)		NRAP in 2010
		Glen Tunnel		NRAP in 2010
		Andy Patented Claim	Allie Group; Falls Creek	NRAP in 2010
RP990000200140	Harold L. Canada Family Trust	Latest Out Mine		NRAP in 2010
		Never Sweat Mine	Pittsburg-Idaho Mine	NRAP in 2010
		Texas Patented Claim		NRAP in 2010
		Sixteen-to-One (16 to 1)	Pittsburg-Idaho Mine	NRAP in 2010
		Silver Dollar Mine		Additional Actions Recommended in 2015
		Silver Dollar Ext. Patented Claim		NRAP in 2010
RP99000020015H	Harold L. Canada Family Trust	Martha Mine	Allie Mining Co.; Gilmore Mining Co.	NRAP in 2015
		Dorothy Mine	Allie Mining Co.	NRAP in 2015
		Ruth Claim	Allie Mining Co.	NRAP in 2015
		G.A.P. Patented Claim		NRAP in 2010
RP99000020015E	Gerald J. Humphries	LaPorte Patented Claim		NRAP in 2010
RP99000020015G	The Olive Land Trust	Olive Patented Claim[b]		Access not granted. No assessment could be completed in 2010 or 2015.
RP99000020015I	Lemhi County Historical Society			No mines/claims on this parcel.
RP9900002000080	Gilmore Property Land Trust			No mines/claims on this parcel.

[a]**Status**" is meant to convey a summary of DEQ's current assessment relative to human health and environmental risks. "**No Remedial Action Planned (NRAP)**" is designated for sites where DEQ did not find any significant evidence indicating the potential of adverse toxicological effects to human or ecological receptors. "**Additional Actions Recommended**" is designated for sites where DEQ recommends additional site investigations and/or remedial actions are necessary to prevent adverse effects to human or ecological receptors. Information supporting NRAP in 2010 is included in the previous PA/SI report (DEQ 2011) and information supporting NRAP in 2015 is included in this report.

[b]Ownership of this parcel was listed as Canada Family in the previous PA/SI (DEQ 2011); however, current ownership is the Olive Land Trust. No response was received from DEQ's attempt to request access.

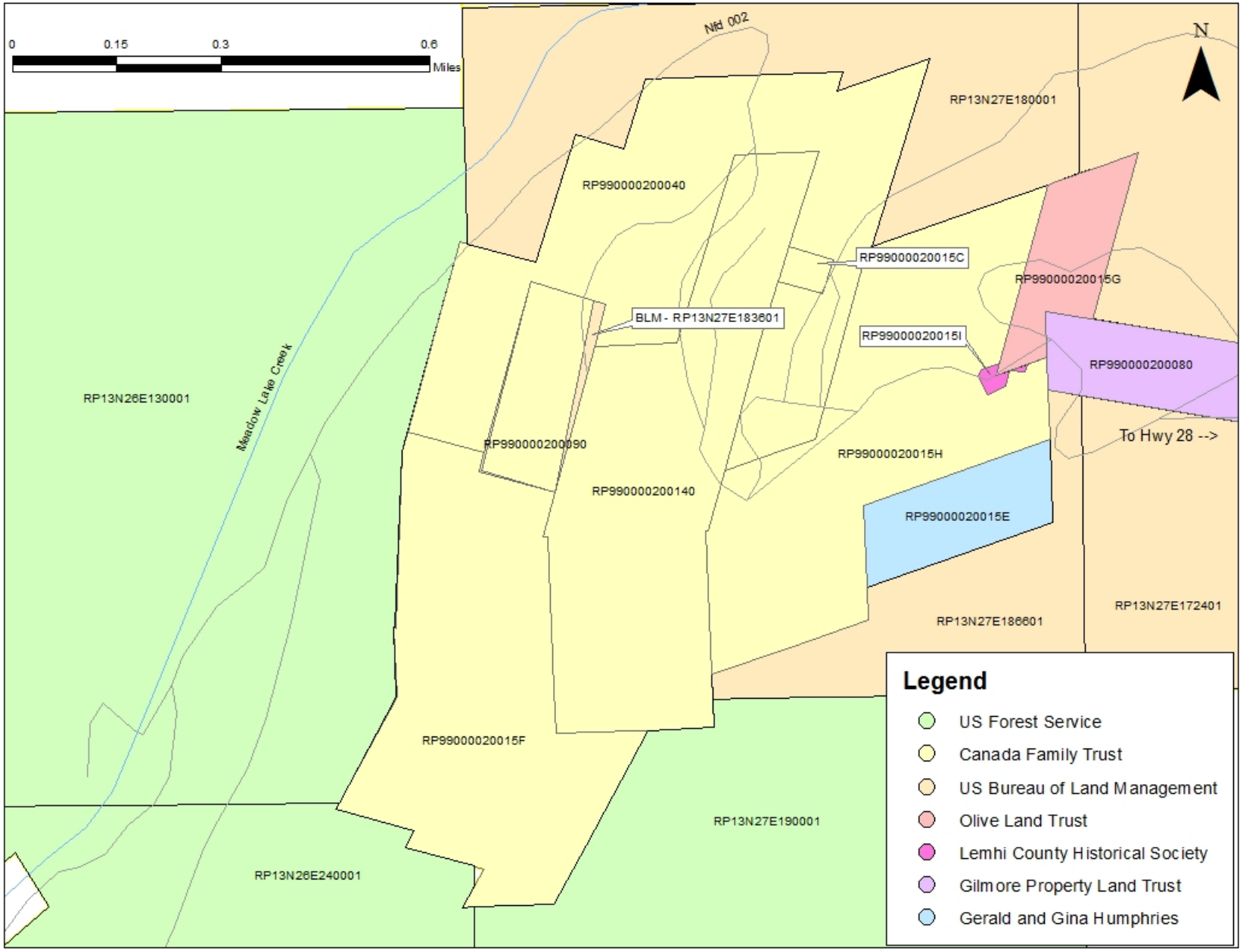

Figure 2. Ownership Map of the Gilmore Division of the Texas Mining District in Lemhi County, Idaho.

2.2 General Geology

A map of the major lithology for the Gilmore Division of the Texas Mining District site is shown in Figure 3. The following information from the U.S. Geological Survey (USGS) Bulletin 528 *Geology and Ore Deposits of Lemhi County, Idaho* (Umpleby 1913) was used to identify the composition of geology and lithology for the area. Since DEQ cannot improve or expand upon information included in historic reports, this information is quoted directly. The tables, plates, and figures referenced in this quote have not been duplicated in this report.

> GEOLOGY.
>
> Sedimentary Rocks.
>
> A great succession of sedimentary rocks, striking north and south and for the most part dipping about 45° E., occupies most of the district. Cambrian, Ordovician, Silurian (?), Devonian (?), and Mississippian formations are present. The basal series is made up of clear-white, fine-grained quartzite and is at least 2,000 feet thick. It is well exposed above Meadow Lake. Conformably above it is a series of massive blue dolomitic limestones about 500 feet thick, which is assigned to the Ordovician. Then follows 300 feet of massive white dolomitic limestone of Silurian (?) age. The strata next above comprise about 2,000 feet of thin-bedded blue and white dolomitic limestones, with here and there a siliceous band. This series is tentatively considered Devonian. Its upper contact was not seen, although it is presumable conformable with the Mississippian. The latter formation is exposed along the lower slopes of the range south of Long Canyon.
>
> Above the Paleozoic rocks along the east side of the district, and separated from them by a marked angular unconformity, is a series of Miocene lake beds, the thickness of which is not known, although more than 200 feet appears in some exposures. If the general history of these beds, as given on pages 35-40, is correct, it is altogether probable that along the eastern edge of the Texas district they are more than 2,000 feet thick. As seen in the railroad cuts they present chalk-white slopes cut by regularly bedded layers of light bluish-gray fine volcanic ash, in places almost pumiceous enough to float on water. The bedding is shown by slight variations in color, the individual bands ranging from half an inch to 4 inches in thickness. In some places thin layers of limestone, slate, and quartzite pebbles are interbedded with the tuff, and in others pebbles and sand are intermixed with it.
>
> The lake beds are traversed by minor faults, usually trending east and west. Dips above 25° were not noted, this maximum being recorded just north of the low divide which extends across the valley. South of the same divide the beds dip 15° S., thus presenting an east-west anticline, the axis of which lies about in line with the south branch of Long Canyon. Indeed, as seen from the valley, the limestones traversed by Long Canyon present a similar anticlinal structure. Here, however, the anticline crosses at right angles a series with an otherwise steep eastward dip, the resulting attitude being a dip to the northeast on the north side of the canyon and to the southeast on the south side.
>
> Not much is known of faulting within the area because the different formations were but imperfectly recognized outside the type locality. West of Gilmore the structural relations are simple, but east of it the rock exposures suggest duplication of formations. Over most of the district, however, the beds dip from 40° to 50° E., thus suggesting the absence of much faulting. On the other hand, displacements were recognized in some of the underground studies. On the Martha claim a fault extending N. 10° E. presents a downthrow of possibly 225 feet on the west. A displacement, possibly the northward extension of the one just mentioned, was noted in the Little Gilmore Tunnel. It strikes N. 10° E. and records a downthrow of 55 feet on the west. In both places the fault plane dips approximately 45° W.
>
> Crossing the north-south structure is a series of east-west vertical fissures, which, beneath the surface, commonly stand as open channels from 1 inch to 5 feet wide. In many places they are lined by beautiful

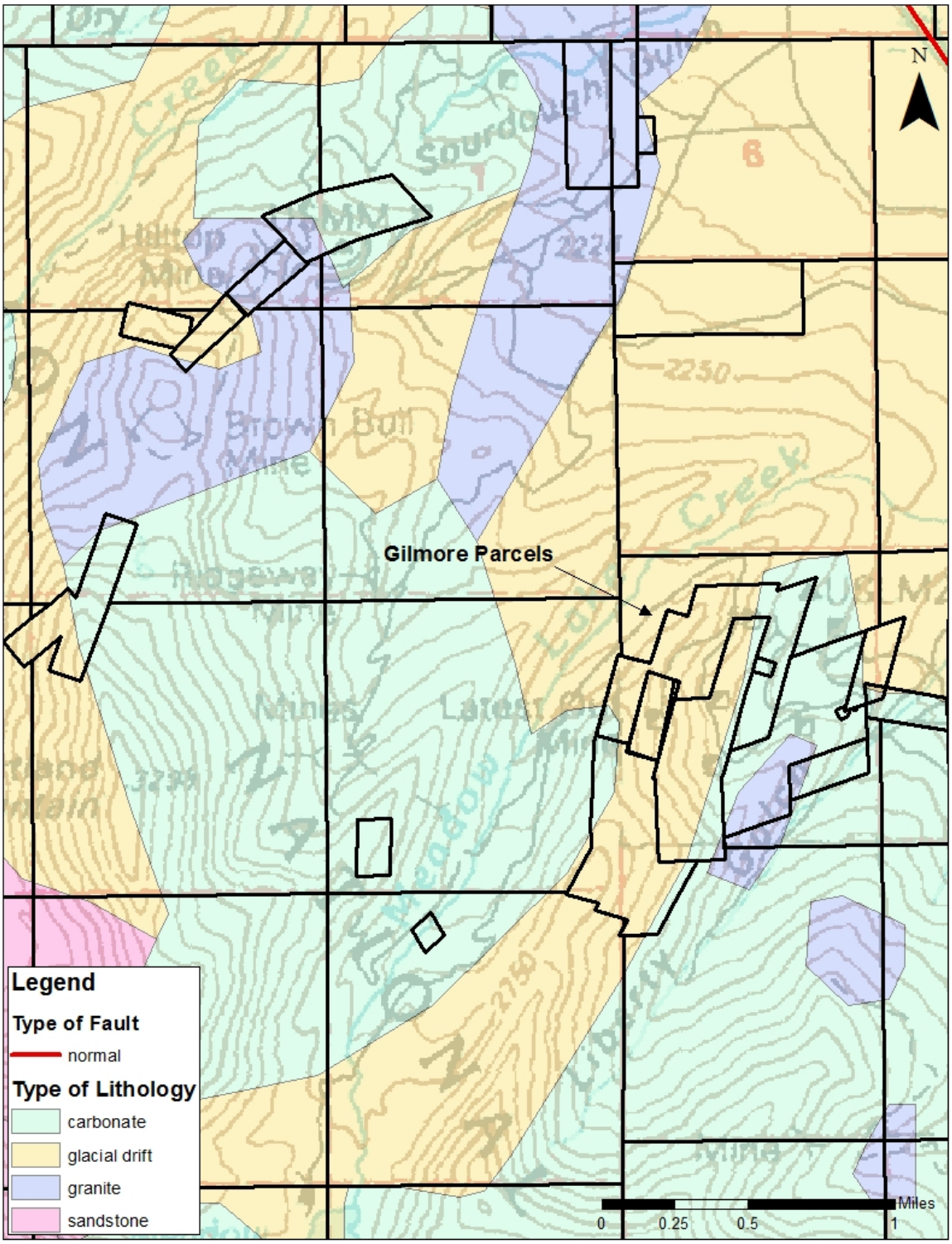

Figure 3. Map of major lithology in the vicinity of the Gilmore Division of the Texas Mining District.

aragonite crystals, and in others are loosely filled with debris from the sides. There seems to have been little displacement along them, and this, together with their obviously recent formation, suggests that they are incident to the low east-west anticline clearly recorded in the lake beds to the east. Parallel to these are older fissures, some of which are mineralized near their intersection with the north-south veins. Jointing is conspicuous throughout both the quartzite and limestone portions of the series.

Igneous Rocks.

Igneous rocks are not abundant in the Texas district, a few quartz diorite porphyry dikes being the only representatives. These are poorly exposed, so that rare outcrops and prospect openings are the only means of determining their distribution and extent. At least two dikes striking N. 10° to 15° E. are present, the east one extending through the Glen and Neversweat claims, above Gilmore. Running west of north are similar dikes, possibly spurs from the others.

In general appearance the dike material is a dark-gray dense porphyritic rock with many medium-sided dull feldspar phenocrysts. On microscopic examination both quartz and biotite are seen to be present in important amounts. The groundmass is microcrystalline and all parts have a higher index than Canada balsam. In many of the feldspars and in much of the groundmass calcite and sericite are conspicuous. The rock may best be designated quartz diorite porphyry.

The dikes were intruded in part at least after mineralization, as shown by an exposure in the upper workings of the Latest Out mine, where one of them cuts across the ore. That they are older than the present topographic features, on the other hand, is clear from an exposure at the head of Meadow Lake, where one of them is exposed in the cirque rim at an elevation of 10,500 feet. As the larger topographic features are post-Eocene, and the ore deposits are late Cretaceous or early Eocene, the dikes were intruded at about the beginning of the Tertiary.

2.3 Climatology

Climate information is based on a summary for Leadore, Idaho obtained from the Western Regional Climate Center (WRCC). The climatological data is collected at the Leadore #2 Model Station (105177; elevation 6,000 amsl) which is approximately 18.5 miles north of the Gilmore Division of the Texas Mining District sites.

The region is characterized by short, cool, dry summers and cold winters. Based on data collected from 1965 to 2015, total annual precipitation averages 8.05 inches with a total annual snowfall of 18.0 inches. The driest month of the year is February. The average annual high temperature is 54.9°F and the average annual low temperature is 23.5°F. July is the hottest month with an average maximum temperature of 84.2°F. January is the coldest month with an average minimum temperature of 3.7°F (WRCC 2016).

2.4 Operational History of Past Mining Activities

Information about the operational history of past mining activities helps DEQ understand the levels of production, commodities, and potential waste types at the site. This information documents the relative importance of historic mining districts and workings as they are reevaluated from the perspective of economics, multiple land use, human health risks, and ecological risks. DEQ uses historical research for several purposes: identify the potential contaminants of concern, estimate the magnitude of waste at the site, locate potentially

dangerous physical hazards such as open adits and shafts, and identify historical land uses that coincide with mining. This information is necessary to prepare for field work.

Numerous sources were used during desktop research prior to visiting the site. Since DEQ cannot improve or expand upon information included in historic reports, this information is quoted directly from USGS Bulletin 528 *Geology and Ore Deposits of Lemhi County, Idaho* (Umpleby 1913). The tables, plates, and figures referenced in this quote have not been duplicated in this report. In addition to this general information, site specific mining history for many of these sites is available in other historic reports (Mitchell 1997, Bennett and Mitchell 2006) but not duplicated here.

> History and Production.
>
> Inspired by the great bodies of lead-silver ore at the Viola mine, situated across the Lemhi Valley, prospectors located many claims in the surrounding country in the early eighties. The most promising among these claims occupied a belt about 12 miles in extent along the east face of the Lemhi Range, a little north of west from the Viola deposits. The Texas district comprises the northern portion of the mineral belt thus early discovered and largely staked out. In it prospecting continued, and mining was carried on in a desultory way for a number of years, some ore being hauled to the Nicholia (Viola) smelter; but with the abandonment of that property about 1890, whatever enthusiasm may have prompted work in the Texas district died out and for 10 or 12 years there was little progress.
>
> In 1902 a group of claims, the chief of which now constitute the Pittsburgh-Idaho property, were purchased by F.G. Laver, of Dubois, Pa., for himself and associates. Early development revealed, at a depth of about 200 feet, ore bodies which greatly exceeded the anticipation of the owners. In a short time considerable ore was blocked out and the method of treatment became a problem of prime importance. The old Nicholia smelter, which had afforded ready market in the early days of the district, had long since been dismantled, and shipping to the large reduction works in Utah or Montana necessitated a haul of 85 miles by wagon in addition to the railway charges. The alternatives were to erect a local plant or await railway transportation. The wagon haul to Dubois, Idaho, was adopted and continued, during the open season, for four years. The roads were so destructive of wagons, however, that it became almost impossible to keep them in repair, and in the fall of 1906 a traction engine with a train of four steel wagons, each of 15 tons capacity, was put on the road. The cars were not equal to the continued strain even though the route was almost ideal for such transportation, and after a dozen trips this method of haulage was abandoned.
>
> From the fall of 1907 until the spring of 1910 the Pittsburgh-Idaho mine was idle, awaiting the completion of the railroad which was being built from Armstead, a station on the Montana branch of the Oregon Short Line, 90 miles south of Butte. During this period the Latest Out mine became active, the ore being hauled to Dubois. In the spring of 1909 several of the smaller properties supplied small amounts of ore to a new smelter which was opened at Hahn, in the Spring Mountain district.
>
> With the extension of the railroad to a point within 9 miles of Gilmore by June, 1910, the camp took on new life and has been increasingly active ever since. In 1910 the railroad was within 1 1/2 miles of the producing mines of the district.
>
> The total production of the Texas district probably falls between $2,000,000 and $2,500,000. Somewhat more than 700 tons of lead bullion and over 100,000 ounces of silver are said to have been derived from ores treated by the old Nicholia smelter between 1885 and 1888. From 1902 until 1908 about 6,270 tons of lead bullion and 325,000 ounces of silver were extracted from ores hauled 85 miles to Dubois, and thence shipped to the smelters in Utah. Between June and October, 1910, about 1,600 tons of lead and 72,000

ounces of silver were produced from Texas district ores, and for the fiscal year from September 1, 1910 to August 3, 1911, 7,750 tons of lead and 351,500 ounces of silver were produced.[1]

Prior to 1910 the district produced almost no gold, but during the spring of that year a promising gold-bearing lode was discovered on the Martha claim of the Allie group.

2.5 Current and Potential Future Land Uses

Residential dwellings are present within the four mile radius of the mining claims in the Texas Division of the Gilmore Mining District; however, the duration of occupancy within these residences is unknown. Although the claims are located on private property, public access is unrestricted as minimal fences, gates, and private property signs are present. An increase in recreational visits to these claims is possible since multiple parcels within the Gilmore townsite (Photo 1), located approximately one half mile east of the mining area, are currently for sale or have been recently sold and signage in the townsite informs visitors about the mining history in this area. The area is surrounded by U.S. Forest Service (USFS), U.S. Bureau of Land Management (BLM), and private property.

Photo 1. Overview of the Gilmore townsite. Photo taken from hillside to the west of the townsite, looking to the east. Waste piles in the foreground are located on the Olive Land Trust.

Current land uses for these claims could include recreational activities such as hiking, backpacking, camping, hunting, horseback riding, biking, and all-terrain vehicle (ATV) touring. These current uses are likely to continue into the future. Potential future land use in this area

[1] The figures for the period prior to Sept. 1, 1910, are largely derived from the known tonnage, estimating lead at 35 per cent and silver at 16 ounces per ton of ore. The silver is not far from correct, although it is quite possible that the early shipments averaged higher than 35 per cent lead. The 8,000 tons of 60 per cent concentrates from the Pittsburgh-Idaho mill and the early production of rich silver ore from the Silver Moon property were considered individually.

could include additional residential developments with increased residential living, especially during the summertime.

3 Sample Collection and Analysis

DEQ staff visited the Texas Division of the Gilmore Mining District on August 4, 2015. The weather was approximately 70°F and partly cloudy. Photographs, sample collection information, and analytical results are presented in this section. The field crew did not purposely or knowingly trespass on any private holdings during field work.

Sampling and laboratory analysis was conducted in accordance with DEQ's Quality Assurance Project Plan (QAPP) for Mine Sites Addressed under the PA Program (DEQ 2015a) and the Field Sampling Plan (FSP) for the Gilmore Division of the Texas Mining District (DEQ 2015b). All samples were collected, handled, and stored in accordance with the QAPP/FSP and submitted to SVL Analytical, Inc. (SVL) in Kellogg, Idaho.

Soil samples were collected by DEQ at a background location and in the vicinity of the Silver Dollar Mine (Figure 4). A summary of the laboratory results and field parameters is presented in Table 2. A copy of the laboratory report is included as Appendix A. Field observations and laboratory results are discussed in the context of migration/exposure pathways and targets in Section 4. The following are descriptions of the sites visited and samples collected:

- *Background Soil Sample* (Photo 2): GM-BG-SS1 was collected from a road cut located along Meadow Lake Road (aka Nfd-002) to the northwest of the Silver Dollar Mine site.
- *Dorothy and Martha Mines* (Photos 3-8): Open shaft and portals, possible collapsed tunnels, waste rock pile, pipes, and buildings are present at the Dorothy Mine. Soil samples were not collected from the waste rock pile because there was no active erosion of the pile, no evidence of a nearby surface water source, and no evidence of extensive recreation or camping at this site. Although, the site is easily accessible to recreationalists.
- *Silver Dollar Mine* (Photos 9-16): Several open holes (adits and portal), two waste rock piles, and a structure are present at the Silver Dollar Mine. This site is easily accessible to recreationalists and there was evidence of a camp fire area. Samples were collected from the camp fire area (Photo 15; GM-SD-SS1) and from the two waste/tailings piles (Photo 16; GM-SD-SS2 and GM-SD-SS3).
- *Allie and Pittsburgh-Idaho Waste Piles* (Photo 17): No samples were collected at this site since it was sampled in 2010 (DEQ 2011).
- *Little Gilmore Waste Rock Pile* (Photo 18): The 2011 PA/SI designated this site as No Remedial Action Planned (DEQ 2011); therefore, no samples were collected.
- *Ruth Mine* (Photos 19-20): A collapsed adit, a building, and mining and residential living debris are present at the Ruth Mine. Soil samples were not collected from the waste rock pile because there was no active erosion of the pile, the pile is located in a well vegetated area surrounded by large trees, no evidence of a nearby surface water source, and no evidence of extensive recreation or camping at this site. Although, the site could be accessible to recreationalists.

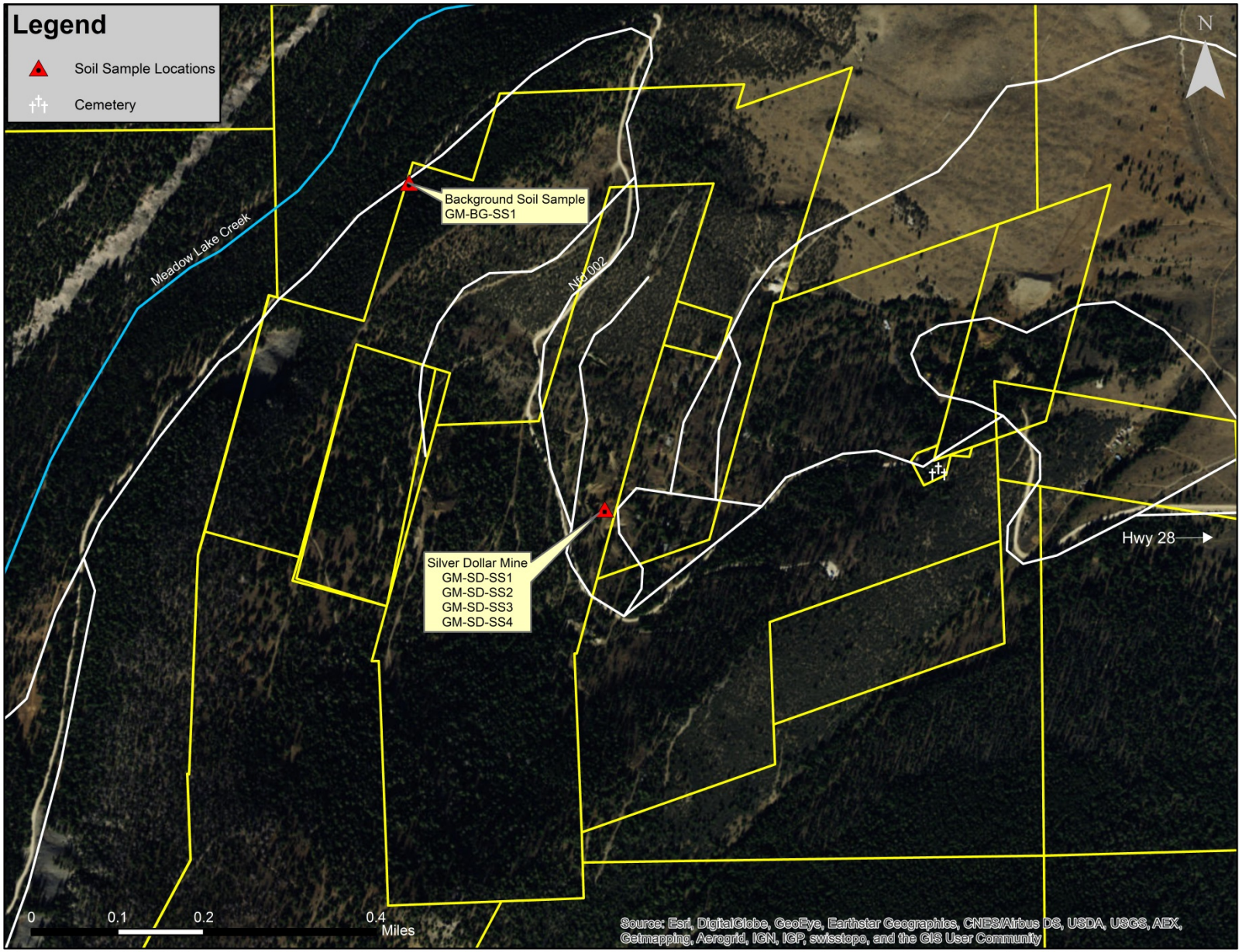

Figure 4. Sample locations.

Table 2. Soil analytical results for the Silver Dollar Mine, Gilmore Division of the Texas Mining District, Lemhi County. Samples collected on August 4, 2015.

Analyte	EPA RSL for Resident Soil[a] (mg/kg)	EPA RSL for Industrial Soil[a] (mg/kg)	Background GM-BG-SS1 (mg/kg)	Silver Dollar Camp Fire Site GM-SD-SS1 (mg/kg)	Silver Dollar Orange Waste Pile GM-SD-SS2 (mg/kg)	Silver Dollar Brown Waste Pile GM-SD-SS3 (mg/kg)	Silver Dollar Brown Waste Pile Duplicate GM-SD-SS4 (mg/kg)
Antimony (Sb)	31	470	<2.0	**114**	**239**	**2,890**	**2,970**
Arsenic (As)	0.68	3.0	28.8	**101**	**690**	**399**	**633**
Barium (Ba)	15,000	220,000	168	**508**	**2,130**	**520**	502
Cadmium (Cd)	71	980	1.12	**22.1**	**52.7**	**37.8**	**40.4**
Chromium (Cr)			5.77	17.0	**40.0**	**42.6**	**45.2**
Copper (Cu)	3,100	47,000	13.6	**442**	**470**	**4,970**	**4,660**
Iron (Fe)	50,000	820,000	9,020	**48,900**	**396,000**	**139,000**	**136,000**
Lead (Pb)	400	800	148	**10,500**	**16,200**	**76,400**	**78,400**
Manganese (Mn)	1,800	26,000	971	**14,800**	**28,800**	**44,300**	**43,800**
Selenium (Se)	390	5,800	<1.00	0.48	1.55	1.58	2.43
Silver (Ag)	390	5,800	0.69	**7.57**	**8.26**	**40.2**	**84.5**
Zinc (Zn)	23,000	350,000	200	**3,950**	**16,300**	**9,510**	**9,800**
Mercury (Hg)	9.4	40	<0.033	**0.688**	**4.35**	**2.82**	**0.377**

Shaded values exceed regional screening levels (RSLs).
Bold =Three times greater than background concentrations.
a = Based on a target hazard quotient of 1.0. *http://www2.epa.gov/risk/risk-based-screening-table-generic-tables*

Photo 2. Background soil sample (GM-BG-SS1) location along Meadow Lake Road.

Photo 3. Dorothy Mine shaft opening.

Photo 4. Looking down the shaft opening at the Dorothy Mine.

Photo 5. Dorothy Mine waste rock pile and pipes.

Photo 6. Former structure at Dorothy Mine.

Photo 7. Former structure at Dorothy Mine.

Photo 8. Possible extension of either the Dorothy or Martha mines.

Photo 9. Silver Dollar Mine portal.

Photo 10. Silver Dollar Mine open adits and portal.

Photo 11. Silver Dollar Mine structure.

Photo 12. Silver Dollar Mine structure and waste piles.

Photo 13. Silver Dollar Mine structure.

Photo 14. Silver Dollar Mine adit.

Photo 15. Silver Dollar Mine camp fire soil sample (GM-SD-SS1) location.

Photo 16. Silver Dollar Mine waste piles; sample GM-SD-SS2 from orange pile on left; samples GM-SD-SS3 and GM-SD-SS4 from brown pile on right.

Photo 17. Allie and Pittsburgh-Idaho Mine waste piles.

Photo 18. Little Gilmore Mine waste rock pile.

Photo 19. Ruth Mine collapsed adit.

Photo 20. Ruth Mine historical building.

4 Migration/Exposure Pathways and Targets

The purpose of this Supplemental SI is to evaluate the sites in the Gilmore Division of the Texas Mining District to identify if any releases or potentials for release are present to pathways and targets. Pathways and exposure routes that may lead to human or ecological receptors include: surface water pathways (Section 4.1), ground water pathways (Section 4.2), and soil exposure and air pathways (Section 4.3).

4.1 Surface Water Pathways

The surface water migration pathway target distance limit (TDL) begins at the probable point of entry (PPE) of surface water runoff from a site to a surface water body and extends downstream for 15 miles. During the site visit, no surface water was observed around the mine sites; therefore, no surface water was available for sample collection. The presence of a surface water pathway may be seasonal or only present during high precipitation events.

The surface water TDL is shown in Figure 5. The path for the 15-mile TDL follows Texas Creek. If water is present near the mine sites, likely due to high precipitation events, Meadow Lake Creek and Liberty Gulch Creek (not shown on Figure 5) are both potential tributaries to Texas Creek. Other surface water features, such as wetlands along Texas Creek and Meadow Lake (fresh water pond) located near Meadow Lake Campground, are also present within a 4-mile radius of the mine sites.

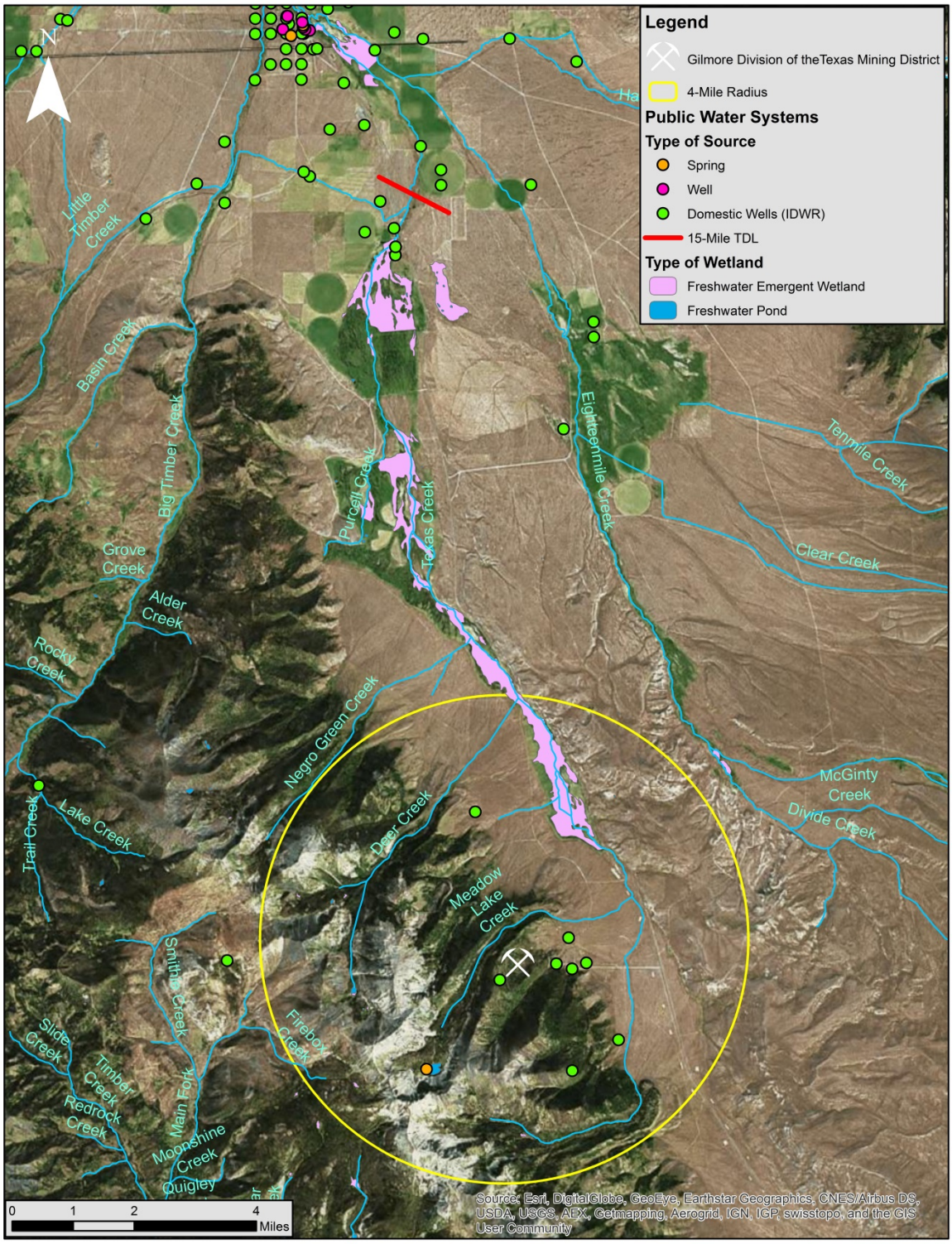

Figure 5. Map of the features supporting evaluation of the surface water and ground water pathways in the area of the Texas Division of the Gilmore Mining District.

Analysis of the surface water pathway and targets for this Supplemental SI also includes evaluation of sensitive waterways (Section 4.1.1) and identification of sensitive, rare, and threatened plant and animal species (Section 4.1.2).

The potential for migration and exposure via the surface water pathways was not assessed as part of this Supplemental SI because no surface water was available to sample during this site visit.

4.1.1 Sensitive Waterways

The Clean Water Act (CWA) requires that the State of Idaho prepare an Integrated Report listing: (1) current conditions of all state waters (§305(b) list) and (2) waters that are impaired and need a total maximum daily load (TMDL; §303(d) list). §305(b)-listed streams, are shown on Figure 6. Meadow Lake Creek (ID17060204SL039_02) and Texas Creek (ID17060204SL036_03, ID17060204SL038_02, ID170204SL038_03, and ID17060204SL040_02) were not sampled as part of this PA/SI. Texas Creek is a tributary to the Lemhi River (Lemhi River subbasin hydrologic unit code 17060204) and contained in the Lemhi River hydrologic unit code.

As listed in the final 2012 Integrated Report, Meadow Lake Creek has not been assessed; Texas Creek to the confluence with Deer Creek has not been assessed; Texas Creek from Deer Creek to the Lemhi River has been identified as not supporting for cold water aquatic life, salmonid spawning, and secondary contact recreation.

4.1.2 Sensitive, Rare, and Threatened Plant and Animal Species

Sensitive species can have large habitat ranges that overlap the vicinity of the Gilmore Division of the Texas Mining District. Based on the resource list obtained during a search of the Information for Planning and Conservation System (USFWS 2016), the following species are identified for Lemhi County:

- Birds: Yellow-Billed Cuckoo, *Coccyzus americanus*, threatened species.
- Mammals: Canada Lynx, *Lynx canadensis*, threatened species and North American Wolverine, *Gulo gulo luscus*, proposed threatened.
- Fish: Bull Trout, *Salvelinus confluentus*, threatened species-designated critical habitat and Steelhead, *Oncorhynchus mykiss*, designated critical habitat.
- Plants: Whitebark Pine, *Pinus albicaulis*, candidate species.

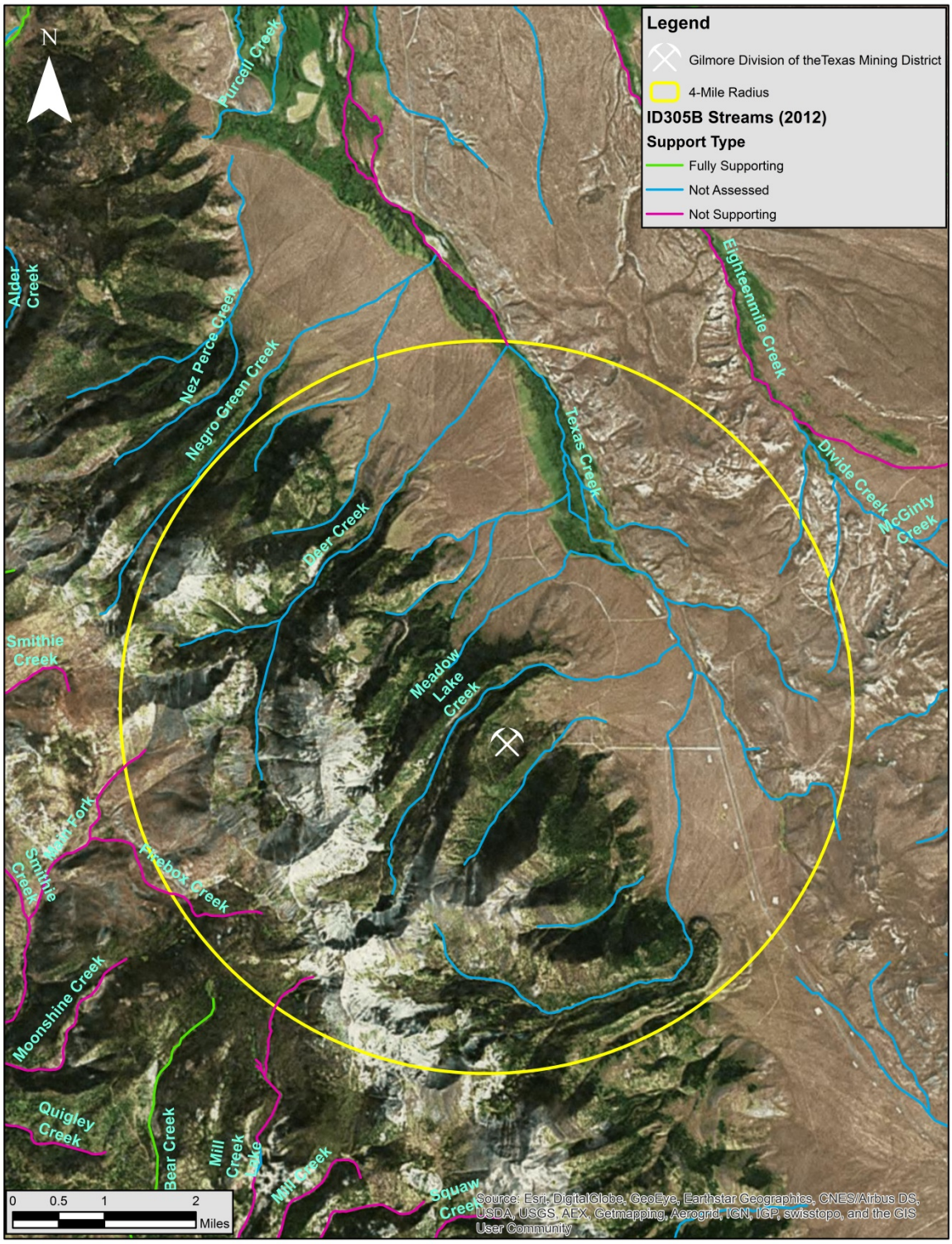

Figure 6. State of Idaho §305(b)-listed streams in the vicinity of the Texas Division of the Gilmore Mining District.

4.2 Ground Water Pathways

In areas where historic mines are close to residential areas, contamination of drinking water systems may come from two types of mine sources (ore bodies and waste dumps) and along three ground water pathways illustrated by the following three scenarios:

- Heavy metals can leach from tailing piles and waste rock dumps, enter ephemeral or perennial drains, and contaminate the area's shallow ground water system.
- Heavy metals can leach from the local ore bodies and be transported through the geologic structure to the shallow ground water.
- Heavy metals can leach out of the ore bodies and be discharged from the underground workings as adit water, which is then conveyed through ephemeral and perennial drains to the shallow ground water system.

Potential drinking water systems within the 4-mile radius of the Gilmore Division of the Texas Mining District include one public water system (PWS) and eight domestic wells (Figure 5). Idaho Department of Water Resources (IDWR) drillers' logs indicate that the approximate depth to water in the Gilmore townsite is 300 feet below land surface. A source water assessment (SWA) summary report has not been completed for the PWS within this 4-mile radius (USFS Meadow Lake Campground public water system, PWS#ID7300083); however, this PWS is from a spring and located upgradient and segregated from the mine sites by structural geology.

Given the lack of domestic wells and PWS in the immediate vicinity of the mine site and the depth to water within the Gilmore townsite, the potential for exposure from ground water pathways is minimal to non-existent. The ground water pathway was not assessed as part of this Supplemental SI.

4.3 Soil Exposure and Air Pathways

As observed during the 2010 PA/SI (DEQ 2011) and again during DEQ's site visit for this Supplemental SI, evidence of recreational use of the area is present. Meadow Lake Campground is at the end of Gilmore Road (aka Nfd 002 or Meadow Lake Road) and the area where the mines are located is not closed off to the public. Only a few properties have "No Trespassing" signs posted.

The closest cluster of residential dwellings are approximately one half mile east of the mine sites within the Gilmore townsite; occupancy and duration of occupancy within these residences is unknown. However, since several parcels within the townsite are currently for sale or have been recently sold, additional residential developments with increased residential living is expected, especially during the summertime. No schools or day care facilities are located within four miles of the mine sites.

Soil laboratory analytical results were compared to the following criteria: 1) EPA regional screening levels (RSLs) for residential and industrial soil and 2) background concentrations (Table 2). The following observations are based on the analytical laboratory results:

- *Background* (Photo 2, Figure 4): The background arsenic concentration of 28.8 mg/kg is above the EPA residential and industrial RSLs. Also the background lead concentration is 148 mg/kg, which is below RSLs.
- *Silver Dollar Mine Camp Fire Site* (Photo 15, Figure 4): Concentrations of antimony (114 mg/kg), arsenic (101 mg/kg), lead (10,500 mg/kg), and manganese (14,800 mg/kg) are above the residential RSLs. Arsenic and lead are also above the industrial RSLs.
- *Silver Dollar Mine Waste Piles* (Photo 16, Figure 4):
    - The orange waste pile had concentrations of antimony (239 mg/kg), arsenic (690 mg/kg), iron (396,000 mg/kg), lead (16,200 mg/kg), and manganese (28,800 mg/kg) above the residential RSLs; and arsenic, lead, and manganese above the industrial RSLs.
    - Duplicate samples were collected from the brown waste pile. Concentrations of antimony (2,890/2,970 mg/kg), arsenic (399/633 mg/kg), copper (4,970/4,660 mg/kg), iron (139,000/136,000 mg/kg), lead (76,400/78,400 mg/kg), and manganese (44,300/43,800 mg/kg) are above the residential RSLs; and antimony, arsenic, lead, and manganese are above the industrial RSLs.
- *Quality Assurance/Quality Control (QA/QC):* A duplicate soil sample (GM-SD-SS4) was collected from the brown waste pile (Table 2). The analytical results show that all of the analytes measured met the relative percent difference (RPD) goal of 20 percent except for arsenic, selenium, silver, and mercury. Arsenic and selenium met the maximum allowable RPD of 50 percent but silver and mercury exceeded the allowable RPD. Concentrations of selenium, silver, and mercury were below the RSLs, but silver and mercury were still three times greater than background concentrations. The variability in these results is likely attributed to the field sample collection method. The duplicate sample was collected using the replicate method where samples were taken one immediately following the other; rather than being collected as split subsamples drawn from the same initial volume.

The Silver Dollar Mine site is a location of concern for recreational users given the high levels of metals detected in the waste piles and within the soil at the camp fire site, easy access to this site from the main road, and evidence of camping. Additional actions to further characterize the extent of contamination at this location and to identify remedial actions for the piles and surrounding contaminated soil is recommended. For future planning purposes, here are the approximate dimensions of the piles:

- Orange Pile: Approximately 4 feet tall, 20 feet wide, and at least 50 feet long; however, the pile extends down the hill side.
- Brown Pile: Approximately 3.5 feet tall, 18 feet wide, and 23 feet long.

Given these observations and the concentrations of the piles, the soil exposure pathway is complete for recreational users at the Silver Dollar Mine. The air pathway was not evaluated as part of this Supplemental SI.

5 Conclusions and Recommendations

The purpose of this Supplemental SI is to assess the threat posed to human health and the environment and determine the need for additional investigation or remediation at the Gilmore Division of the Texas Mining District sites. The following conclusions and recommendations are based on the observations and soil samples collected for the mine sites during the 2010 PA/SI and during the site visit for this Supplemental SI.

5.1 Mining Sites

As summarized in Table 1 of this report and based on current conditions and uses, historic information, data observations made during the site visit, potential pathways of contaminants to receptors, and potential exposures to ecological and human receptors, DEQ recommends No Remedial Action Planned (NRAP) for many of the mine sites within the Gilmore Division of the Texas Mining District. However, further characterization of these sites should be performed if residential development is considered in the future, recreational use of these areas increases, and/or there is discovery of migration/erosion of waste piles to a surface water source.

Many of these sites have dangerous mine openings. DEQ recommends that the landowner works with Idaho Department of Lands (IDL) for safe closure of all mine openings. In addition, the landowner should consider installing a mechanism to discourage recreational use by visitors at and near these mine sites (for example: signs, fences, gates, or closing access roads or paths).

Additional actions are recommended for the **Silver Dollar Mine** because high levels of metals are detected at this site and recreational use is present creating a soil exposure pathway to humans. The landowner should contact DEQ and IDL to determine a path forward for the following:

- Further characterize the extent of metals in soil surrounding the piles, within the vicinity of the camp site area, and throughout the accessible areas of the mine site.
- Identify potential alternatives for the two piles and surrounding soils with high metal concentrations.
- Safe closure of all mine openings and installation of a mechanism to discourage recreational use (especially camping).

5.2 Health and Safety Information

Persons recreating in this area should be aware of the hazards of historic mining areas, especially health risks associated with prolonged exposures to metals. A summary of health and safety information includes:

- Do not camp or recreate near old mining structures or mining waste piles or dumps.
- Keep dirt away from your mouth to prevent ingestion of metals. Wash your hands with soap and water before eating, drinking, or smoking. Frequently clean toys used by babies, toddlers, and children. Eat on a clean surface, not on the ground.

- Stay out of old mine adits and structures. Rotting wood, unstable rock, oxygen-depleted air, falling debris, dust, and mining wastes are potential dangers.

Visitors are drawn to the historic mine sites in this area when traveling to Meadow Lake Campground or visiting the Gilmore townsite. Open holes and accessible roads and paths are present along the main road as visitors travel to the Meadow Lake Campground. Also, interpretive mining history signage is present in the townsite (Photo 21).

As an effort to make visitors aware of the physical hazards and metals in soil within this area, a panel with 'Play Safe' messaging has been added to the display in the Gilmore townsite (Photos 22 and 23). Funding and creation of this panel was possible through collaboration with the Idaho Department of Health and Welfare (IDHW), BLM (BLM 2014), and the Lemhi County Historical Society (Lemhi County Historical Society and Museum 2016).

Photo 21. Interpretative mining history signage at the Gilmore townsite in 2015.

Photo 22. Play Safe signage added at the Gilmore townsite in 2016.

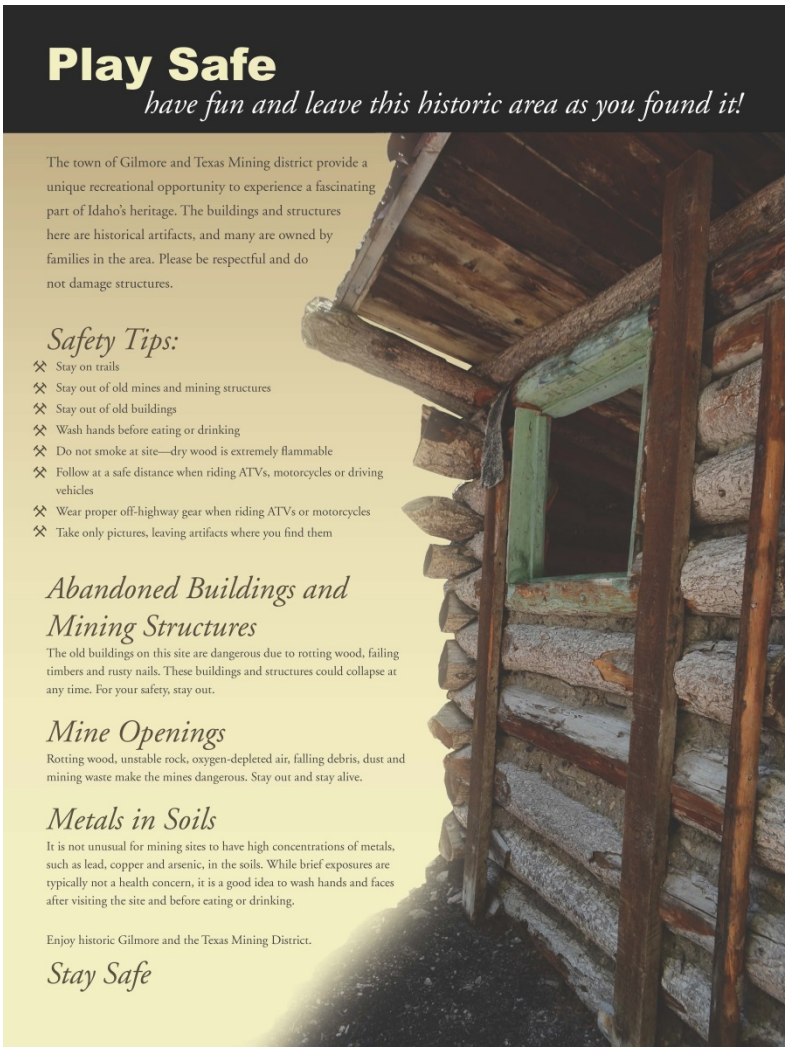

Photo 23. Play Safe messaging.

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Appendix A. Laboratory Sample Reports

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CHAIN OF CUSTODY RECORD

Page 1 of 1

W5H0409

FOR SVL USE ONLY
SVL JOB #

TEMP on Receipt:

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

Report to Company: IDEQ	**Invoice Sent To:** IDEQ
Contact: Dana Swift	Contact: Dana Swift
Address: 1410 N. Hilton Boise ID 83706	Address: same
Phone Number: 208-373-0296	Phone Number:
FAX Number: 208-373-0154	FAX Number:
E-mail: dana.swift@deq.idaho.gov	PO#:

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other_____

Project Name: Gilmore

Sampler's Signature: Dana Swift

Indicate State of sample origination: ID

USACE? ☐ Yes ☒ No

	Sample ID	Collection			Misc.		Preservative(s)							Analyses Required	Rush Instructions (Days)	Comments
	Please take care to distinguish between: 1 and I 2 and Z 5 and S ø and O Thanks!	Date	Time	Collected by: (Init.)	Matrix Type (From Table 1)	No. of Containers	Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify)	Total Metals		Soil samples: Air dry and sieve to 2mm. Total Metals: Ba, Cd, Cr, Ag, Cu, Fe, Mn, Zn, Sb, Se, Hg, As, Pb
1	GM-BG-SS1	8/4/15	12:45	RH	3	1	X							X		
2	GM-SD-SS2		2:28	RH	3	1	X							X		
3	GM-SD-SS3		2:33	RH	3	1	X							X		
4	GM-SD-SS1		2:25	RH	3	1	X							X		
5	GM-SD-SS4		2:33	RH	3	1	X							X		
6																
7																
8																
9																
10																

Dana Swift 8/18/15

Relinquished by: Dana Swift	Date: 8/18/15	Time: 9:00	Received by:		Date: 8/19/15	Time: 15:00
Relinquished by:	Date:	Time:	Received by:		Date:	Time:

* 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: 8/19/15 By: C. Flores

SVL Work No: 1505H0409

Item	Description	V	VC	NV	NA	Comments
1	Client or project name	✓				IDEQ
2	Date and time of receipt at lab	✓				8/19/15 15:00
3	Received by	✓				C. FLORES
4	Temperature blank or cooler temperature				✓	Temp. N/A °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				✓	Soil
12	Did an SVL employee preserve sample(s) upon receipt				✓	
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	✓				

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

Additional Comments: _____

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

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received	Notes
GM-BG-SS1	W5H0409-01	Soil	04-Aug-15 12:45	RH	19-Aug-2015	
GM-SD-SS2	W5H0409-02	Soil	04-Aug-15 14:28	RH	19-Aug-2015	
GM-SD-SS3	W5H0409-03	Soil	04-Aug-15 14:33	RH	19-Aug-2015	
GM-SD-SS1	W5H0409-04	Soil	04-Aug-15 14:25	RH	19-Aug-2015	
GM-SD-SS4	W5H0409-05	Soil	04-Aug-15 14:33	RH	19-Aug-2015	

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.

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

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

Client Sample ID: **GM-BG-SS1**
SVL Sample ID: **W5H0409-01 (Soil)**

Sampled: 04-Aug-15 12:45
Received: 19-Aug-15
Sampled By: RH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) (Sieved)										
EPA 6020A	**Arsenic**	28.8	mg/kg Dry	1.50	0.290	10	W534178	KWH	09/02/15 08:06	D8,R5
EPA 6020A	**Lead**	148	mg/kg Dry	0.200	0.040	10	W534178	KWH	09/02/15 09:22	M3
EPA 6020A	Selenium	< 1.00	mg/kg Dry	1.00	0.45	10	W534178	KWH	09/02/15 08:06	D8
Metals (Total) by EPA 6000/7000 Methods (Sieved)										
EPA 6010C	Antimony	< 2.0	mg/kg Dry	2.0	0.7		W535249	SMB	09/02/15 11:00	
EPA 6010C	**Barium**	168	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:17	M2
EPA 6010C	**Cadmium**	1.12	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:17	
EPA 6010C	**Chromium**	5.77	mg/kg Dry	0.60	0.16		W535275	SMB	09/01/15 11:17	
EPA 6010C	**Copper**	13.6	mg/kg Dry	1.00	0.28		W535275	SMB	09/01/15 11:17	
EPA 6010C	**Iron**	9020	mg/kg Dry	6.0	4.5		W535275	SMB	09/01/15 11:17	
EPA 6010C	**Manganese**	971	mg/kg Dry	0.40	0.27		W535275	SMB	09/01/15 11:17	M3
EPA 6010C	**Silver**	0.69	mg/kg Dry	0.50	0.22		W535275	SMB	09/01/15 11:17	
EPA 6010C	**Zinc**	200	mg/kg Dry	1.0	0.7		W535275	SMB	09/01/15 11:17	M2
EPA 7471B	Mercury	< 0.033	mg/kg Dry	0.033	0.005		W535196	DB	08/31/15 12:50	

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

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

Client Sample ID: **GM-SD-SS2**
SVL Sample ID: **W5H0409-02 (Soil)**

Sampled: 04-Aug-15 14:28
Received: 19-Aug-15
Sampled By: RH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) (Sieved)										
EPA 6020A	**Arsenic**	690	mg/kg Dry	0.300	0.058	2	W534178	KWH	09/02/15 07:59	D1
EPA 6020A	**Lead**	16200	mg/kg Dry	2.00	0.400	100	W534178	KWH	09/02/15 09:27	D2
EPA 6020A	**Selenium**	1.55	mg/kg Dry	0.30	0.09	2	W534178	KWH	09/02/15 07:59	D1
Metals (Total) by EPA 6000/7000 Methods (Sieved)										
EPA 6010C	**Antimony**	239	mg/kg Dry	2.0	0.7		W535249	SMB	09/02/15 11:14	
EPA 6010C	**Barium**	2130	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:35	
EPA 6010C	**Cadmium**	52.7	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:35	
EPA 6010C	**Chromium**	40.0	mg/kg Dry	0.60	0.16		W535275	SMB	09/01/15 11:35	
EPA 6010C	**Copper**	470	mg/kg Dry	1.00	0.28		W535275	SMB	09/01/15 11:35	
EPA 6010C	**Iron**	396000	mg/kg Dry	60.0	45.0	10	W535275	SMB	09/01/15 12:12	D2
EPA 6010C	**Manganese**	28800	mg/kg Dry	4.00	2.70	10	W535275	SMB	09/01/15 12:12	D2
EPA 6010C	**Silver**	8.26	mg/kg Dry	0.50	0.22		W535275	SMB	09/01/15 11:35	
EPA 6010C	**Zinc**	16300	mg/kg Dry	10.0	6.9	10	W535275	SMB	09/01/15 12:12	D2
EPA 7471B	**Mercury**	4.35	mg/kg Dry	0.330	0.053	10	W535196	DB	08/31/15 12:59	D2

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

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

Client Sample ID: **GM-SD-SS3**
SVL Sample ID: **W5H0409-03 (Soil)**

Sampled: 04-Aug-15 14:33
Received: 19-Aug-15
Sampled By: RH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) (Sieved)										
EPA 6020A	**Arsenic**	399	mg/kg Dry	0.300	0.058	2	W534178	KWH	09/02/15 08:00	D1
EPA 6020A	**Lead**	76400	mg/kg Dry	10.0	2.00	500	W534178	KWH	09/02/15 09:28	D2
EPA 6020A	**Selenium**	1.58	mg/kg Dry	0.30	0.09	2	W534178	KWH	09/02/15 08:00	D1
Metals (Total) by EPA 6000/7000 Methods (Sieved)										
EPA 6010C	**Antimony**	2890	mg/kg Dry	2.0	0.7		W535249	SMB	09/02/15 11:19	
EPA 6010C	**Barium**	520	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:40	
EPA 6010C	**Cadmium**	37.8	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:40	
EPA 6010C	**Chromium**	42.6	mg/kg Dry	0.60	0.16		W535275	SMB	09/01/15 11:40	
EPA 6010C	**Copper**	4970	mg/kg Dry	10.0	2.80	10	W535275	SMB	09/01/15 12:16	D2
EPA 6010C	**Iron**	139000	mg/kg Dry	60.0	45.0	10	W535275	SMB	09/01/15 12:16	D2
EPA 6010C	**Manganese**	44300	mg/kg Dry	4.00	2.70	10	W535275	SMB	09/01/15 12:16	D2
EPA 6010C	**Silver**	40.2	mg/kg Dry	0.50	0.22		W535275	SMB	09/01/15 11:40	
EPA 6010C	**Zinc**	9510	mg/kg Dry	10.0	6.9	10	W535275	SMB	09/01/15 12:16	D2
EPA 7471B	**Mercury**	2.82	mg/kg Dry	0.330	0.053	10	W535196	DB	08/31/15 13:01	D2

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

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

Client Sample ID: **GM-SD-SS1**
SVL Sample ID: **W5H0409-04 (Soil)**

Sampled: 04-Aug-15 14:25
Received: 19-Aug-15
Sampled By: RH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) (Sieved)										
EPA 6020A	**Arsenic**	101	mg/kg Dry	0.300	0.058	2	W534178	KWH	09/02/15 08:01	D1
EPA 6020A	**Lead**	10500	mg/kg Dry	2.00	0.400	100	W534178	KWH	09/02/15 09:30	D2
EPA 6020A	**Selenium**	0.48	mg/kg Dry	0.30	0.09	2	W534178	KWH	09/02/15 08:01	D1
Metals (Total) by EPA 6000/7000 Methods (Sieved)										
EPA 6010C	**Antimony**	114	mg/kg Dry	2.0	0.7		W535249	SMB	09/02/15 11:23	
EPA 6010C	**Barium**	508	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:44	
EPA 6010C	**Cadmium**	22.1	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:44	
EPA 6010C	**Chromium**	17.0	mg/kg Dry	0.60	0.16		W535275	SMB	09/01/15 11:44	
EPA 6010C	**Copper**	442	mg/kg Dry	1.00	0.28		W535275	SMB	09/01/15 11:44	
EPA 6010C	**Iron**	48900	mg/kg Dry	6.0	4.5		W535275	SMB	09/01/15 11:44	
EPA 6010C	**Manganese**	14800	mg/kg Dry	4.00	2.70	10	W535275	SMB	09/01/15 12:20	D2
EPA 6010C	**Silver**	7.57	mg/kg Dry	0.50	0.22		W535275	SMB	09/01/15 11:44	
EPA 6010C	**Zinc**	3950	mg/kg Dry	1.0	0.7		W535275	SMB	09/01/15 11:44	
EPA 7471B	**Mercury**	0.688	mg/kg Dry	0.033	0.005		W535196	DB	08/31/15 13:03	

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John Kern
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IDEQ (Boise)
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Boise, ID 83706

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

Client Sample ID: **GM-SD-SS4**
SVL Sample ID: **W5H0409-05 (Soil)**

Sampled: 04-Aug-15 14:33
Received: 19-Aug-15
Sampled By: RH

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total) (Sieved)										
EPA 6020A	**Arsenic**	633	mg/kg Dry	75.0	14.5	500	W534178	KWH	09/02/15 08:28	D8
EPA 6020A	**Lead**	78400	mg/kg Dry	10.0	2.00	500	W534178	KWH	09/02/15 09:31	D2
EPA 6020A	**Selenium**	2.43	mg/kg Dry	1.00	0.45	10	W534178	KWH	09/02/15 09:41	D8
Metals (Total) by EPA 6000/7000 Methods (Sieved)										
EPA 6010C	**Antimony**	2970	mg/kg Dry	2.0	0.7		W535249	SMB	09/02/15 11:27	
EPA 6010C	**Barium**	502	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:49	
EPA 6010C	**Cadmium**	40.4	mg/kg Dry	0.20	0.07		W535275	SMB	09/01/15 11:49	
EPA 6010C	**Chromium**	45.2	mg/kg Dry	0.60	0.16		W535275	SMB	09/01/15 11:49	
EPA 6010C	**Copper**	4660	mg/kg Dry	10.0	2.80	10	W535275	SMB	09/01/15 12:23	D2
EPA 6010C	**Iron**	136000	mg/kg Dry	60.0	45.0	10	W535275	SMB	09/01/15 12:23	D2
EPA 6010C	**Manganese**	43800	mg/kg Dry	4.00	2.70	10	W535275	SMB	09/01/15 12:23	D2
EPA 6010C	**Silver**	84.5	mg/kg Dry	0.50	0.22		W535275	SMB	09/01/15 11:49	
EPA 6010C	**Zinc**	9800	mg/kg Dry	10.0	6.9	10	W535275	SMB	09/01/15 12:23	D2
EPA 7471B	**Mercury**	0.377	mg/kg Dry	0.033	0.005		W535196	DB	08/31/15 13:05	D2

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

John Kern
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IDEQ (Boise)
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Boise, ID 83706

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total)								
EPA 6020A	Arsenic	mg/kg	<0.300	0.058	0.300	W534178	02-Sep-15	D1
EPA 6020A	Lead	mg/kg	<0.100	0.008	0.100	W534178	02-Sep-15	B7,D1
EPA 6020A	Selenium	mg/kg	<0.30	0.09	0.30	W534178	02-Sep-15	D1
Metals (Total) by EPA 6000/7000 Methods								
EPA 6010C	Antimony	mg/kg	<2.0	0.7	2.0	W535249	02-Sep-15	
EPA 6010C	Barium	mg/kg	<0.20	0.07	0.20	W535275	01-Sep-15	
EPA 6010C	Cadmium	mg/kg	<0.20	0.07	0.20	W535275	01-Sep-15	
EPA 6010C	Chromium	mg/kg	<0.60	0.16	0.60	W535275	01-Sep-15	
EPA 6010C	Copper	mg/kg	<1.00	0.28	1.00	W535275	01-Sep-15	
EPA 6010C	Iron	mg/kg	<6.0	4.5	6.0	W535275	01-Sep-15	
EPA 6010C	Manganese	mg/kg	<0.40	0.27	0.40	W535275	01-Sep-15	
EPA 6010C	Silver	mg/kg	<0.50	0.22	0.50	W535275	01-Sep-15	
EPA 6010C	Zinc	mg/kg	<1.0	0.7	1.0	W535275	01-Sep-15	
EPA 7471B	Mercury	mg/kg	<0.033	0.005	0.033	W535196	31-Aug-15	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)									
EPA 6020A	Arsenic	mg/kg	2.26	2.50	90.5	80 - 120	W534178	02-Sep-15	D1
EPA 6020A	Lead	mg/kg	2.48	2.50	99.3	80 - 120	W534178	02-Sep-15	D1
EPA 6020A	Selenium	mg/kg	2.12	2.50	84.7	80 - 120	W534178	02-Sep-15	D1
Metals (Total) by EPA 6000/7000 Methods									
EPA 6010C	Antimony	mg/kg	98.1	100	98.1	80 - 120	W535249	02-Sep-15	
EPA 6010C	Barium	mg/kg	92.5	100	92.5	80 - 120	W535275	01-Sep-15	
EPA 6010C	Cadmium	mg/kg	95.3	100	95.3	80 - 120	W535275	01-Sep-15	
EPA 6010C	Chromium	mg/kg	100	100	100	80 - 120	W535275	01-Sep-15	
EPA 6010C	Copper	mg/kg	101	100	101	80 - 120	W535275	01-Sep-15	
EPA 6010C	Iron	mg/kg	928	1000	92.8	80 - 120	W535275	01-Sep-15	
EPA 6010C	Manganese	mg/kg	90.7	100	90.7	80 - 120	W535275	01-Sep-15	
EPA 6010C	Silver	mg/kg	4.89	5.00	97.7	80 - 120	W535275	01-Sep-15	
EPA 6010C	Zinc	mg/kg	91.5	100	91.5	80 - 120	W535275	01-Sep-15	
EPA 7471B	Mercury	mg/kg	0.863	0.833	104	80 - 120	W535196	31-Aug-15	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total) by EPA 6000/7000 Methods									
EPA 7471B	Mercury	mg/kg	0.898	0.848	5.7	20	W535196	31-Aug-15	

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IDEQ (Boise)
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Boise, ID 83706

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

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 6020A	Arsenic	mg/kg	31.0	28.8	2.50	87.9	75 - 125	W534178	02-Sep-15	D8,R5
EPA 6020A	Lead	mg/kg	153	148	2.50	R > 4S	75 - 125	W534178	02-Sep-15	M3
EPA 6020A	Selenium	mg/kg	2.91	<1.00	2.50	116	75 - 125	W534178	02-Sep-15	D8
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010C	Antimony	mg/kg	103	<2.0	100	102	75 - 125	W535249	02-Sep-15	
EPA 6010C	Barium	mg/kg	172	168	100	3.81	75 - 125	W535275	01-Sep-15	M2
EPA 6010C	Cadmium	mg/kg	102	1.12	100	101	75 - 125	W535275	01-Sep-15	
EPA 6010C	Chromium	mg/kg	102	5.77	100	96.0	75 - 125	W535275	01-Sep-15	
EPA 6010C	Copper	mg/kg	120	13.6	100	106	75 - 125	W535275	01-Sep-15	
EPA 6010C	Iron	mg/kg	9840	9020	1000	82.3	75 - 125	W535275	01-Sep-15	
EPA 6010C	Manganese	mg/kg	702	971	100	R > 4S	75 - 125	W535275	01-Sep-15	M3
EPA 6010C	Silver	mg/kg	5.85	0.69	5.00	103	75 - 125	W535275	01-Sep-15	
EPA 6010C	Zinc	mg/kg	272	200	100	71.9	75 - 125	W535275	01-Sep-15	M2
EPA 7471B	Mercury	mg/kg	1.10	0.848	0.333	75.0	75 - 125	W535196	31-Aug-15	

Quality Control - MATRIX SPIKE DUPLICATE Data

Method	Analyte	Units	MSD Result	Spike Result	Spike Level	%R	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total)											
EPA 6020A	Arsenic	mg/kg	17.1	31.0	2.50	R > 4S	58.0	20	W534178	02-Sep-15	D8,R5
EPA 6020A	Lead	mg/kg	101	153	2.50	R > 4S	41.5	20	W534178	02-Sep-15	M3
EPA 6020A	Selenium	mg/kg	2.68	2.91	2.50	107	8.2	20	W534178	02-Sep-15	D8
Metals (Total) by EPA 6000/7000 Methods											
EPA 6010C	Antimony	mg/kg	108	103	100	106	4.2	20	W535249	02-Sep-15	
EPA 6010C	Barium	mg/kg	177	172	100	8.79	2.9	20	W535275	01-Sep-15	M2
EPA 6010C	Cadmium	mg/kg	103	102	100	101	0.5	20	W535275	01-Sep-15	
EPA 6010C	Chromium	mg/kg	102	102	100	96.6	0.6	20	W535275	01-Sep-15	
EPA 6010C	Copper	mg/kg	120	120	100	107	0.2	20	W535275	01-Sep-15	
EPA 6010C	Iron	mg/kg	9950	9840	1000	92.8	1.1	20	W535275	01-Sep-15	
EPA 6010C	Manganese	mg/kg	729	702	100	R > 4S	3.9	20	W535275	01-Sep-15	M3
EPA 6010C	Silver	mg/kg	5.96	5.85	5.00	105	2.0	20	W535275	01-Sep-15	
EPA 6010C	Zinc	mg/kg	272	272	100	72.3	0.2	20	W535275	01-Sep-15	M2
EPA 7471B	Mercury	mg/kg	1.21	1.10	0.333	108	9.4	20	W535196	31-Aug-15	

Quality Control - POST DIGESTION SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total)										
EPA 6020A	Arsenic	mg/kg	48.6	28.8	20.0	98.9	75 - 125	W534178	02-Sep-15	D8
EPA 6020A	Lead	mg/kg	163	148	20.0	78.2	75 - 125	W534178	02-Sep-15	D1
EPA 6020A	Selenium	mg/kg	21.2	<1.00	20.0	106	75 - 125	W534178	02-Sep-15	D8
Metals (Total) by EPA 6000/7000 Methods										
EPA 6010C	Barium	mg/kg	165	168	2.00	-126	75 - 125	W535275	01-Sep-15	M3
EPA 6010C	Zinc	mg/kg	208	200	10.0	82.8	75 - 125	W535275	01-Sep-15	M3

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

Project Name: Gilmore 2015
Work Order: **W5H0409**
Reported: 02-Sep-15 14:46

Notes and Definitions

B7	Target analyte detected in method blank exceeded method QC limits, but concentrations in the samples are at least 10x the blank concentration.
D1	Sample required dilution due to matrix.
D2	Sample required dilution due to high concentration of target analyte.
D8	Sample required dilution to meet internal standard recovery limits.
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.
R5	MS/MSD RPD exceeded the laboratory acceptance limit. Recovery met acceptance criteria.
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