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January 10, 2006

Mr. Greg Weigel, On-Scene Coordinator
United States Environmental Protection Agency
1435 North Orchard Street
Boise, Idaho 83706

Re: Contract No. 68-S0-01-01, Technical Direction Document No. 05-10-0004;
Minnie Moore Mine Removal Action Report

Dear Mr. Weigel:

Enclosed please find the final removal action report for the Minnie Moore Mine site located in Bellevue, Idaho. Removal activities occurred at the site between September 26, 2005 and October 20, 2005. This version includes Appendix D (not provided in the draft report) and addresses your comments regarding the draft report. If you have any further questions or comments, please contact me at (206) 624-9537.

Sincerely,

Jeffrey Fowlow
START-2 Project Leader

Enclosure

cc: Dhroov Shivjiani, E & E START-2 Program Manager, Seattle, WA (letter only)
Mark Woodke, E & E, START-2 Project Manager, Seattle, WA

Minnie Moore Mine
Final Removal Action Report
Bellevue, Idaho
TDD: 05-10-0004

Contract: 68-S0-01-01
January 2006

Region 10
START-2

Superfund Technical Assessment and Response Team

Submitted To: Greg Weigel, On-Scene Coordinator
United States Environmental Protection Agency, Region 10
Idaho Operations Office
1435 North Orchard
Boise, Idaho 83706

**FINAL MINNIE MOORE MINE REMOVAL ACTION REPORT
BELLEVUE, IDAHO**

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LIST OF ACRONYMS

<u>Acronym</u>	<u>Abbreviation</u>
°F	degrees Fahrenheit
g/L	micrograms per liter
bgs	below ground surface
DQO	data quality objective
DUP	duplicate
EPA	United States Environmental Protection Agency
EQM	Environmental Quality Management, Inc.
ERRS	Emergency and Rapid Response Services
HEC	Herrera Environmental Consultants
IDEQ	Idaho Department of Environmental Quality
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
MMM	Minnie Moore Mine
MS	matrix spike
OSC	On-Scene Coordinator
PRG	Preliminary Remediation Goal
QA	quality assurance
QC	quality control
RPD	relative percent difference
SDWA	Safe Drinking Water Act
SI	Site Inspection
SOW	scope of work
SSSP	site-specific sampling plan
S & S	Stratton and Stratton - Minnie Moore Mine Development Company
START	Superfund Technical Assessment and Response Team
TAL	Target Analyte List
UAO	Unilateral Administrative Order
WRDC	White Rabbit Day Care
XRF	x-ray fluorescence

1. INTRODUCTION

In April 2005, the United States Environmental Protection Agency (EPA), Region 10, Office of Environmental Cleanup, tasked Ecology and Environment, Inc., under the Superfund Technical Assessment and Response Team (START)-2 contract No. 68-S0-01-01, to provide technical support at the Minnie Moore Mine (MMM) site in Bellevue, Idaho, under Technical Direction Document number 05-04-0007. This removal action report is written under Technical Direction Document number 05-10-0004 at the direction of the EPA On-Scene Coordinator (OSC).

The MMM site is the location of a former silver mine and mill. The mine was active between 1881 and 1887 and intermittent activity occurred until 1986. Currently, the site includes a shop, bunk house, mill remains, a domestic well, two dry tailings ponds, and a tailings pile. The tailings pile, situated on relatively flat land, was about 20 feet tall prior to the removal action and covers approximately 6 acres.

A site inspection report prepared in 2004 indicated that lead concentrations in the tailings pile were between 1,400 and 18,500 milligrams per kilogram (mg/kg). Arsenic and cadmium also were detected in the tailings. Lead concentrations in sediments of Broadford Slough, located a short distance east of the tailings pile's toe and which empties into the Big Wood River downstream from the site, were as high as 3,300 mg/kg. Cadmium was detected in an on-site well at a concentration of 6.0 micrograms per liter (g/L), which is significantly above background levels and exceeds the Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL) of 5.0 g/L. (HEC 2004)

During an EPA OSC site visit in May 2004, it was observed that a family with several small children was living in the bunk house located within 200 feet of the tailings pile. New residential construction was going up next to the site, and a residence used as a day care facility was located within one quarter mile of the site. The tailings pile was subject to wind and hydraulic erosion. Access to the site and the tailings pile was unrestricted, and there was evidence of recreational use by all-terrain vehicles and/or motorcycles on the tailings pile.

Based on the information obtained through the site inspection and through direct observations, the EPA OSC determined that the site posed an imminent and substantial threat to human health and the environment and initiated a fund-lead, time-critical removal action. The START-2 and Emergency and

Rapid Response Services (ERRS) contractors were tasked to assist in the removal activities. On-site activities began on September 26, 2005, and included the excavation and on-site disposal of approximately 2,500 tons of lead-contaminated surface soils from the mill area, consolidation of excavated soil on the existing tailings pile, reconfiguration of the tailings pile to minimize erosion and infiltration, and construction of a permanent cover on the tailings pile. The removal action was completed by October 20, 2005.

2. SITE DESCRIPTION AND HISTORY

This section describes the site location (subsection 2.1), the terrain, geology, and hydrogeology of the surrounding areas (subsection 2.2), operations at the site (subsection 2.3), and previous investigations at the site (subsection 2.4).

2.1 LOCATION

The MMM site is located about 1.5 miles west of Bellevue, Idaho, on Broadford Road (Figure 2-1). The properties encompass over 265 acres in Section 35, Township 2 North, Range 18 East, Boise Meridian, in Blaine County, Idaho. The surrounding area is comprised of residential and publicly administered lands (Figure 2-2). The MMM site includes portions of three separate properties. The majority of the site features such as the bunk house, shop and mill remains, mine shafts, domestic well, tailings pile, and upper tailings overflow pond are located on property owned by Minnie Moore Mine, Inc., a partnership between Carl Johnston and James Bilbray, and Minnie Moore Resources, Inc., owned by Carl Johnston. The northeast corner of the tailings pile is situated on property owned by Shannon and Arek Pace, and the lower tailings overflow pond is on property owned by William Evans. Mr. Evans has built a rock berm around the north end of the lower tailings overflow pond to demarcate his property boundary. Mick Halverson's property, adjacent to but not part of the MMM site, is located south of the Pace's property and north of Mr. Evans' property. Broadford Slough flows through Mr. Halverson's property. (HEC 2004)

2.2 SURROUNDING AREAS

This subsection discusses the surrounding area's terrain (subsection 2.2.1), geology and hydrogeology (subsection 2.2.2), and climate (subsection 2.2.3).

2.2.1 Terrain

The MMM site is situated at the mouth of Minnie Moore Gulch at an elevation of 5,300 feet above sea level (HEC 2004). Steep hills associated with the Minnie Moore Gulch drainage area border the MMM site on the west, but the remainder of the site is relatively flat in grade. Features at the site

include the remains of a shop, a former bunk house, a domestic well, remains of the former mill, a tailings pile, and two dry tailings overflow ponds (Figure 2-2; HEC 2004). The bunk house, domestic well, and shop and mill remains are situated on the west side of the site. The tailings pile encompasses much of the east side of the site. The upper and lower tailings overflow ponds are located south of the tailings pile.

For the purposes of this report, the south end of the MMM site is defined by the lower tailings overflow pond and the north end of the site is defined by the access road/driveway north of the shop remains. The west side of the site is defined by the steep hillside west of the bunk house and shop and mill remains. The east side of the site is defined by Broadford Slough, which flows along the east bank of the tailings pile to its confluence with the Big Wood River, 2.1 miles southeast of the site.

Vehicular access to the MMM site is through the gate located at the Broadford Road entrance to the site. This gate is usually open to vehicles.

Surface water runoff from the MMM site either percolates into the subsurface or flows overland towards Broadford Slough. The MMM site lies within the Federal Emergency Management Agency 100-year flood plain (FEMA 2000). Reportedly, a major flood in the 1950s had the site under water (EPA 2005). Additionally, the site lies at the base of Minnie Moore Gulch, and upland drainage onto the site is estimated at 140 acres.

2.2.2 Geology and Hydrogeology

The MMM site lies within the Paleozoic Milligen, Wood River, and Dollarhide Formations, which consist of sandstones, limestones, siltstones, and conglomerates. The Wood River Valley area is characterized by several episodes of faulting- and folding-related regional tectonic events and igneous intrusions, with more faulting found on the west side than the east. As there is more faulting on the west side of the Wood River Valley, most intrusive rocks, ore deposits, and hydrothermal systems are found on the west side as well. (IDWR 1990)

Groundwater resources within the Big Wood River Basin are typically found as shallow-depth (less than 100 feet below ground surface [bgs]), cold waters from alluvial aquifers or basalt flows (IDWR 1990). These aquifers consist of valley and lake sediments underlain by basalt and bedrock and were formed by sediment deposition when Big Wood River and Camas Creek were blocked by lava flows in the center of the basin and again in the southeast corner of the basin (HEC 2004). Generally, groundwater flows from the north to the south with seasonal depth fluctuations varying from a few feet to as much as 40 feet (HEC 2004).

At the site, groundwater is present in an aquifer consisting of sand, gravel, and some clay. One well, originally constructed for industrial uses, is present at the site and is currently used for domestic purposes. The well extends to a depth of 82 feet bgs, with water present from 25 to 47 feet bgs. An apparent confining layer consisting of fine sand and some clay is present below 47 feet bgs. Another domestic well is located on the Pace's property east of Broadford Slough. This well extends to a depth of 80 feet bgs, with groundwater encountered at 20 feet bgs. (HEC 2004)

2.2.3 Climate

The climate in Bellevue, Idaho, is mild and arid with annual precipitation in the area averaging 15.89 inches a year, mostly in the form of snow and winter precipitation. Winters in Bellevue are cold and wet, while summers are dry and warm. The average temperature in Bellevue ranges from an average low of 7.8 degrees Fahrenheit (°F) in January to an average high of 84.8 °F in July. (WRCC 2005)

2.3 OPERATIONS

2.3.1 Owner and Operator History

In 1880, four men (Moore, Scriber, Grayson, and Miller) began mining operations at the Minnie Moore Mine. Since the mine opened, the mine has had over 15 owners and operators. In 1974, Carl Johnston and James Bilbray formed a partnership called Minnie Moore Mine, Inc., and purchased the mine. Reportedly, most of the tailings pile is on a separate property consisting of seven acres and owned by Minnie Moore Resources, Inc. (Johnston 2005).

2.3.2 Operational History

Mining began in 1880, and the MMM produced over \$7 million of ore between 1881 and 1887. In 1889, the mine was closed and the shafts were allowed to flood. Mining operations resumed in 1900. By 1908, the Idaho Consolidated Mines Company constructed a new ball mill at the site. Equipment at the site at this time included water pumps to keep the main shafts dry, a 750-horsepower hydroelectric power plant, and ore concentration equipment for re-processing 140,000 tons of old mill tailings. The old tailings were believed to contain up to 2.2 percent lead, 11.5 percent zinc, 6 ounces per ton silver, and 0.03 ounces per ton gold. (HEC 2004)

The mill processed ore through two methods: wet processing and dry concentration. Wet processing involved crushing, close classification, and concentration. Other equipment associated with wet processing included a slime separation unit and triplex rolls which were utilized for more efficient,

uniform ore crushing. The dry concentration process equipment included a revolving dryer, dry concentrating tables, and classifiers. (HEC 2004)

Mining at the site continued until 1927, when the mine was abandoned and the mill was dismantled. Exploratory mining activities resumed in 1932 when Federal Mining and Smelting Company began sinking a new shaft about 500 feet west and uphill from the tailings pile. This shaft was not successful at locating the Minnie Moore vein, so the property was sold to the Stratton and Stratton - Minnie Moore Mine Development Company (S & S) who continued searching for the Minnie Moore vein. S & S did not find the Minnie Moore vein but did find the Bergman vein, which did not contain much ore. S & S abandoned operations at the mine in 1944 after shipping some of the old tailings off the property. (HEC 2004)

In 1949, Silver Star-Queens Mines Company began to rehabilitate one of the mine shafts (Rockwell Shaft) on the MMM property in order to access the lower levels of the Queen of the Hills Mine, located immediately north of the MMM. A blowout in the rehabilitated mine shaft forced mining operations to cease in 1959. Federal Resources Corporation purchased the MMM property in 1961 and constructed a flotation mill capable of processing 250 tons of ore per day. Tailings were reprocessed between 1964 and 1965. In 1974, Carl Johnston and James Bilbray purchased the property and began conducting limited quarry operations on the site. More tailings reprocessing and exploratory mining activities were conducted by various parties at the site between 1980 and 1986 without much success. (HEC 2004)

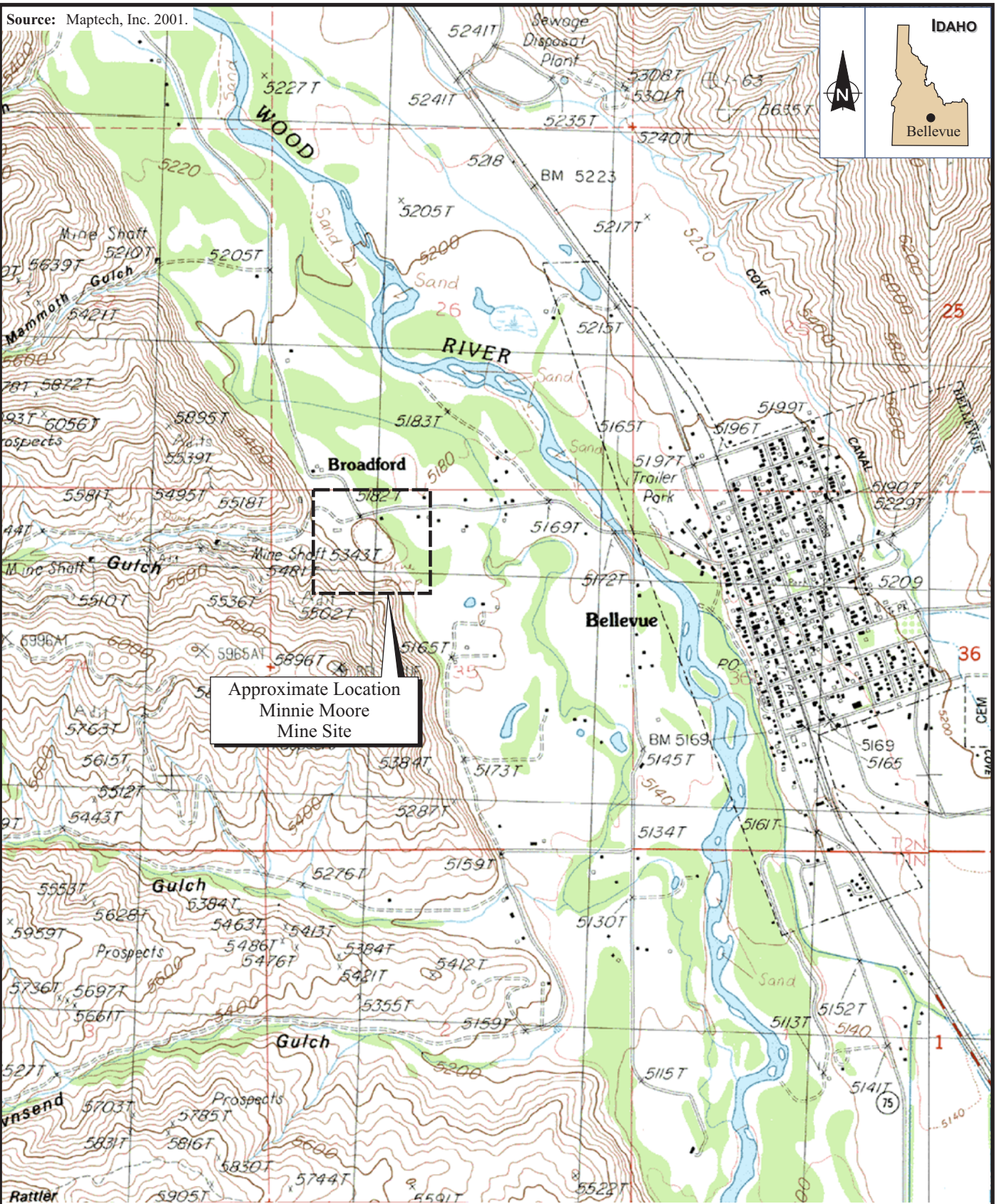
2.4 PREVIOUS INVESTIGATIONS AND CLEANUP ACTIONS

Prior to the EPA initiating a removal action at the MMM site, several investigations were conducted at the site funded by different parties with different interests in the property. Mr. Johnston of Minnie Moore Mine, Inc. covered the upper overflow tailings pond with several feet of fill sometime in 2003. No other previous cleanup actions have been conducted at the site. A summary of previous investigations conducted at the site is provided below.

- **Mine Waste Sampling:** 1995, Shannon and Arek Pace. The Paces collected samples of tailings located on their property. Tailings samples were collected from the top and toe of the tailings pile and were analyzed for total metals. The tailings were found to contain up to 4,600 mg/kg arsenic, up to 127 mg/kg lead, and up to 4.3 mg/kg cadmium. (HEC 2004)

- **Wetlands Delineation:** 1996, Galena Engineering, Inc. Galena Engineering, Inc. delineated wetlands on the Pace Property and found wetlands crossing the property along Broadford Slough. (HEC 2004)
- **Preliminary Assessment:** 2002, EPA. The EPA performed a preliminary assessment at the MMM site and recommended further action under the Comprehensive Environmental Response, Compensation, and Liability Act. (HEC 2004)
- **Site Inspection (SI):** 2004, Herrera Environmental Consultants (HEC) Site Inspection Report. HEC conducted a SI at the MMM site between June 29 and July 2, 2003. The SI involved collection of 13 surface soil samples (from both on- and off-site locations), eight sediment samples from Broadford Slough and the Broadford Slough diversion ditch, and groundwater samples from the on-site domestic well, the Pace's domestic well, and Mr. Halverson's domestic well, located approximately 700 feet east of the site. Lead concentrations in surface soils on the tailings pile ranged up to 18,500 mg/kg, while the concentrations of lead in surface soils surrounding the old mill structures ranged up to 4,260 mg/kg. Cadmium was detected at a concentration of 6 g/L in the sample collected from the on-site domestic well, exceeding the SDWA MCL by 1 g/L. No other groundwater samples contained metals at concentrations exceeding the SDWA MCL. Sediment samples collected downstream of the site were found to contain lead at concentrations up to 3,280 mg/kg. Arsenic was found in downstream sediment samples at concentrations up to 1,200 mg/kg. (HEC 2004)

Source: Maptech, Inc. 2001.



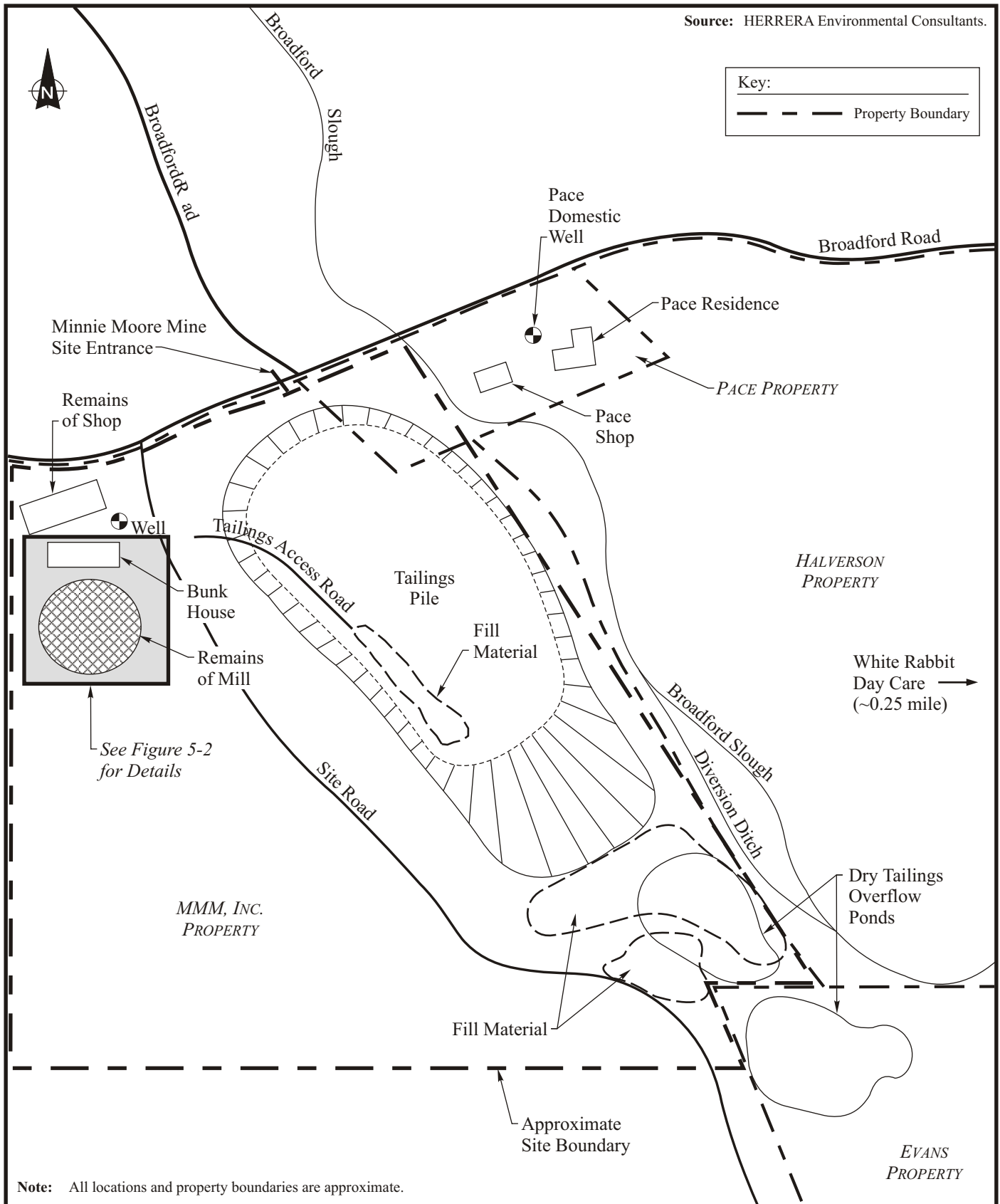
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Seattle, Washington

MINNIE MOORE MINE SITE
Blaine County, Idaho

0 1000 2000
Approximate Scale in Feet

Figure 2-1
SITE LOCATION MAP

Date: 11-21-05	Drawn by: AES	10:START-2\05040007\fig2-1
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Note: All locations and property boundaries are approximate.



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 Seattle, Washington

MINNIE MOORE MINE SITE
 Blaine County, Idaho

0 100 200
 Approximate Scale in Feet

Figure 2-2
 SITE LAYOUT MAP

Date:
 11-21-05

Drawn by:
 AES

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3. QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control (QA/QC) data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware and reagents. Specific QC requirements for laboratory analyses are incorporated in the Contract Laboratory Program Statement of Work for Inorganic Analyses (EPA 2004c). These QC requirements or equivalent requirements found in the analytical method were followed for analytical work on the project. This section describes the QA/QC measures taken and provides an evaluation of the usability of data presented in this report.

All samples were collected following the guidance of the Site-Specific Sampling Plan (SSSP; E & E 2005a). Selected target analyte list (TAL) metals (EPA SW-846 method 6200) analyses were performed on-site by a START-2 engineer and additional TAL metals (EPA SW-846 6000 and 7000 series methods) analyses were performed by Laucks Testing Laboratories, Inc., a commercial laboratory located in Seattle, Washington.

Field laboratory data were reviewed in accordance with the manufacturer's instructions and EPA SW-846 Method 6200. Data from the commercial laboratory was reviewed and validated by a START-2 chemist. Data validation memoranda are provided as Appendix A. Data qualifiers were applied as necessary according to the following guidance:

- EPA (1990) Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004); and
- EPA (2004b) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review.

In the absence of other QC guidance, method-specific QC limits were also utilized to apply qualifiers to the data. Correlation between the commercial and field analytical data was performed by a START-2 chemist and is discussed in subsection 3.5.

3.1 SATISFACTION OF DATA QUALITY OBJECTIVES

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

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

The EPA OSC determined that definitive data without error and bias determination would be used for the sampling and analyses conducted during the field activities. The data quality achieved during the field work produced sufficient data that met the DQOs stated in the SSSP (E & E 2005a). A discussion of accomplished objectives is presented in the following subsections.

3.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

QA samples (rinsate and trip blanks) were not collected for this project. Rinsate blanks were not required as all samples were collected using dedicated sampling equipment. Trip blank samples are not required for inorganic analyses. QC samples included matrix spike (MS)/duplicate (DUP) samples for inorganic analyses at a rate of one MS/DUP per 20 samples per matrix per analysis.

3.3 PROJECT-SPECIFIC DATA QUALITY OBJECTIVES

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

3.3.1 Precision

Precision measures the reproducibility of the sampling and analytical methodology. Laboratory and field precision is defined as the relative percent difference (RPD) between duplicate sample analyses. The laboratory duplicate samples or MS/MS duplicate samples measure the precision of the analytical method.

The RPD values were reviewed for all commercial laboratory samples. A total of five sample results (approximately 4.3% of the data) were qualified as estimated quantities (J) based on duplicate outliers, therefore the DQO for precision of 85% was met.

3.3.2 Accuracy

Accuracy measures the reproducibility of the sampling and analytical methodology. Laboratory accuracy is defined as the MS percent recoveries for all analyses. A total of 10 sample results

(approximately 8.7% of the data) were qualified as estimated quantities (J or UJ). The project DQO for accuracy of 85% was met.

3.3.3 Completeness

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

3.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental conditions. The number and selection of samples were determined in the field to account accurately for site variations and sample matrices. The DQO for representativeness of 85% was met.

3.3.5 Comparability

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

3.4 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL PARAMETERS

The laboratory data also were reviewed for holding times/temperature, laboratory blank samples, and serial dilution analyses. These QA/QC parameters are summarized below. In general, the laboratory and field QA/QC parameters were considered acceptable.

3.4.1 Holding Times/Temperature

All holding times and temperature limits were met.

3.4.2 Laboratory Blanks

All laboratory blanks met the frequency criteria. The following analytes were detected in laboratory blanks:

TAL Metals: Antimony, beryllium, mercury, sodium.

Associated sample results less than five times the blank concentrations were qualified as not detected (U). Associated sample results less than five times the absolute value of the negative blank concentrations were qualified as estimated quantities (J or UJ).

3.4.3 Serial Dilution

One serial dilution sample was analyzed per 20 samples per matrix, therefore meeting frequency criteria. A total of 15 sample results (approximately 13.0% of the data) were qualified as estimated quantities (J) based on serial dilution outliers.

3.5 FIELD ANALYSIS

A START-2 engineer analyzed 28 soil samples in duplicate for selected TAL metals using an Innov-X x-ray fluorescence (XRF) instrument. The XRF field results were used to determine the area of surface soil to be excavated from the former mill area. Five soil samples were also submitted to a commercial laboratory for confirmation analysis. The field and commercial laboratory analyses included slightly different metals; the following metals were reported by both the field and commercial laboratory techniques and were subjected to the correlation process: antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc.

Because soil samples were analyzed twice in the field laboratory, the field data was condensed into an adjusted value for comparison with the corresponding commercial laboratory result, and because some metals were not detected in the samples submitted to the commercial laboratory, non-detect values also needed to be converted to an adjusted value that could be compared with the field analytical data. The field laboratory adjusted value was obtained by averaging the two field analysis results when the concentration was greater than the detection limit. To calculate the field laboratory adjusted value for instances when one result was greater than the detection limit and one result was less than the detection limit, the positive result and one half of the detection limit were averaged. Adjusted values for instances when both the field and commercial laboratory result were less than the detection limit were calculated by taking one half of the average detection limit. Commercial laboratory qualifiers were ignored when generating the adjusted values.

The linear regression analysis of the TAL metals' correlation values performed by a START-2 chemist showed an overall correlation coefficient (R^2) of 0.761 (Table 3-1). According to EPA guidance, a minimum correlation coefficient of 0.700 is necessary to consider field analytical results acceptable

when compared with laboratory confirmation results. The field screening accomplished its objective of identifying areas of contamination and of determining the extent of contamination.

TABLE 3-1

**FIELD vs. COMMERCIAL LABORATORY CORRELATION
MINNIE MOORE MINE SITE
BELLEVUE, IDAHO**

LABORATORY	FIELD (wet weight)				COMMERCIAL (dry weight)	
Analyte	Result 1 (mg/kg)	Result 2 (mg/kg)	Average (mg/kg)	Correlation Value	Result (mg/kg)	Correlation Value
Antimony	72 U	73 U	73 U	37	264 J	264
	104.22	139.25	122	122	13.3 J	13.30
	67 U	65 U	66 U	33	0.97 UJ	0.48
	68 U	70 U	69 U	35	0.84 UJ	0.42
	63 U	64 U	64 U	32	1.9 UJ	0.95
Arsenic	55.06	56.81	56	56	1,500	1,500
	762.58	792.23	778	778	2,680	2,680
	15.77	22.11	19	19	18.7	18.7
	14.19	9.45	12	12	15.4	15.4
	58.37	48.69	53	53	55.5	55.5
Barium	948.81	911.26	930	930	96.4	96.4
	869.22	793.96	832	832	175	175
	513.81	347 U	344	344	94.2	94.2
	562.57	392 U	380	380	107	107
	456.6	348 U	316	316	126	126
Cadmium	38 U	39 U	39 U	20	205	205
	46.79	41 U	34	34	54.0	54
	35 U	34 U	35 U	18	0.71	0.71
	36 U	37 U	37 U	19	0.70	0.70
	34 U	34 U	34 U	17	2.1	2.1
Chromium	169 U	171 U	170 U	85	17.4 J	17.4
	191 U	194 U	193 U	97	25.9 J	25.9
	121 U	110 U	116 U	58	19.8 J	19.8
	118 U	129 U	124 U	62	30.1 J	30.1
	110 U	118 U	114 U	57	27.3 J	27.3
Copper	35.59	45.85	40.72	40.72	435	435
	124.22	95.16	110	110	99.0	99
	20 U	19 U	20 U	10	11.0	11
	21 U	22.75	17	17	13.1	13.1
	20 U	20 U	20 U	10	19.9	19.9
Iron	34111.47	35139.05	34,625	34,625	54,600	54,600
	36076.96	32446.32	34,260	34,260	29,900	29,900
	11466.12	10091.37	10,779	10,779	11,300	11,300
	12247.03	14546.77	13,397	13,397	13,200	13,200
	11790.16	11855.54	11,823	11,823	13,500	13,500
Lead	400.54	385.32	393	393	20,000	20,000
	3730.06	3473.07	3,602	3,602	3,560	3,560
	92.93	50.16	71.55	72	47.9	47.9
	28.34	34.88	31.61	31.61	26.4	26.4
	197.28	175.7	186	186	158	158
Manganese	753.93	751.68	753	753	5,810	5,810
	1293.01	1293.99	1,294	1,294	1,300	1,300
	233.5	187.85	211	211	158	158
	214.48	295.23	255	255	200	200
	276.96	271.61	274.5	274.5	246	246
Mercury	13 U	15 U	14 U	7	5.1	5.1
	28 U	26 U	27 U	14	1.8	1.8
	10 U	9 U	10 U	5	0.014 J	0.01
	11 U	11 U	11 U	6	0.009 UJ	0.01
	11 U	11 U	11 U	6	0.097	0.10
Nickel	57 U	58 U	58 U	29	27.5 J	27.5
	68 U	66 U	67 U	34	19.8 J	19.8
	49 U	65.4	45	45	15.9 J	15.9
	48 U	51 U	50 U	25	18.6 J	18.6
	45 U	46 U	46 U	23	21.9 J	21.9
Selenium	4 U	4 U	4 U	2	12.5	12.5
	9 U	9 U	9 U	5	4.4	4.4
	3 U	3 U	3 U	2	1.1	1.1
	3 U	3 U	3 U	2	0.93	0.93
	3 U	3 U	3 U	2	1.5	1.5
Silver	32 U	32 U	32 U	16	167	167
	35 U	35 U	35 U	18	22.1	22.1
	30 U	29 U	30 U	15	0.16	0.16
	30 U	31 U	31 U	16	0.04 U	0.02
	28 U	29 U	29 U	15	1.1	1.1
Zinc	528.58	651.45	590	590	22,500	22,500
	8137.59	8222.87	8,181	8,181	10,700	10,700
	120.73	120.93	121	121	95.3	95.3
	68.9	80.07	74.5	75	77.3	77.3
	319.36	276.32	161	161	280	280
OVERALL CORRELATION: 0.761						

4. REMOVAL ACTIVITIES

The removal action was initiated on May 23, 2005, in response to the threat of off-site migration and human exposure to lead and other heavy metal contamination in site soil and tailings material. This section discusses the removal action objectives and strategy (subsection 4.1), provides a chronology of the events that occurred during the removal (subsection 4.2), and discusses the actions taken during the removal (subsection 4.3).

4.1 REMOVAL OBJECTIVES AND STRATEGY

The primary purpose of this removal action was to mitigate the potential threat to human health and the environment posed by the metal-contaminated soils at the site as outlined in the Action Memorandum dated May 23, 2005. The removal action objectives at the MMM site were as follows:

- Mitigate the potential threat to human health by reducing the potential for direct contact with soils contaminated with lead and other heavy metals. Lead was the most prevalent contaminant detected in previous investigations and therefore was used as the indicator contaminant for this removal action.
- Minimize the potential for off-site migration of heavy metal-laden soils through minimizing the potential for wind and hydraulic erosion of tailings material and contaminated surface soils surrounding the former mill, bunk house, and shop areas.
- Minimize the infiltration of precipitation through the tailings pile and the subsequent leaching of contaminants from the tailings pile to surface water and groundwater.

To meet these objectives, the EPA OSC proposed removing the soil surrounding the former mill and bunk house that contained lead at concentrations greater than 700 mg/kg, reshaping the tailings pile to minimize erosion and infiltration of rain water, and constructing a clean, permanent cover on the tailings pile. To accomplish the proposed plans, the EPA OSC assigned the START-2 and ERRS contractors with specific tasks. The scope of work (SOW) for Environmental Quality Management, Inc. (EQM), the ERRS contractor, included the following:

- Secure command posts for the EPA OSC and the ERRS contractor;
- Shape existing tailings pile to meet design specifications: side slopes of 3 horizontal and 1 vertical and crown with 10 horizontal to 1 vertical slopes;
- Establish sediment control measures along the east slope of the tailings pile;
- Remove and dispose of vegetation from the north slope of the tailings pile;

- Remove visible tailings deposits along the toe of the east slope of the tailings pile and place on top of the pile;
- Excavate and remove lead-contaminated soil surrounding the former mill foundation and the bunk house. Place excavated soil on top of the tailings pile, then backfill excavated areas with clean fill;
- Cover the reshaped tailings pile with 2 feet of topsoil provided by the property owner; and,
- Vegetate the tailings pile cover in accordance with engineering specifications.

The START-2 SOW for the removal action included the following:

- Provide engineering design and specifications and design a permanent tailings pile cover that meets removal action objectives;
- Collect and provide field analysis of on-site samples in the former mill and bunkhouse areas to determine the extent of contamination for removal;
- Provide technical support throughout the removal action;
- Collect soil samples from off-site residential properties to determine if the properties have been impacted by mine contamination;
- Maintain site documentation and track START-2 costs;
- Assist the OSC in maintaining communications with the community and other interested parties; and,
- Prepare the final removal action report.

Photographs taken by the START-2 are included in Appendix B. Copies of the pollution reports are included in Appendix C.

4.2 CHRONOLOGY OF SIGNIFICANT REMOVAL EVENTS

May 5, 2004	The EPA conducted an initial site visit and met with one of the MMM property owners, Carl Johnston. Mr. Johnston informed the EPA that he planned to cover the 6-acre tailings pile but currently did not have the resources to construct the cover.
October 1, 2004	The EPA informed Mr. Johnston that a cleanup will likely be required at the MMM site.
November 4, 2004	The Idaho Department of Environmental Quality (IDEQ) concurred with the EPA that a removal action is necessary at the MMM site.

November 10, 2004	Representatives from the EPA and the IDEQ met with Mr. Johnston to discuss removal action requirements.
November 24, 2004	The EPA OSC provided the property owner with a draft SOW for conducting a removal action.
March 9, 2005	The EPA and Mr. Johnston discussed the prospects of a Consent Agreement for site cleanup. Mr. Johnston indicated that he was willing to cover the tailings pile but could not afford to hire a contractor to develop work plans or conduct necessary sampling activities. Mr. Johnston refused to sign a Consent Agreement at the time.
Late March 2005	Mr. Johnston informed the EPA that he found a source for 12,000 cubic yards of topsoil cover material and he was actively moving soil onto the site. Mr. Johnston allowed the EPA and the START-2 access to the site to evaluate the topsoil material.
April 7, 2005	The EPA OSC tasked the START-2 to provide technical support for a removal action at the MMM site.
April 15, 2005	The EPA OSC and two START-2 members visited the site to evaluate the topsoil source that was being transported to the site and assess conditions.
May 23, 2005	The EPA signed an Action Memorandum authorizing a time-critical removal action with project ceiling of \$490,000.
May 25, 2005	Mr. Johnston agreed to allow the EPA on site to conduct a topographic survey of the tailings pile.
June 21, 2005	The EPA issued a Unilateral Administrative Order (UAO) to Mr. Johnston representing Minnie Moore Resources, Inc., the property owner, and to the Federal Resources Corporation, who operated a mill at the site in the 1960s to reprocess tailings creating the current tailings pile.
June 2-4, 2005	A START-2 subcontractor, White Shield, Inc., performed a topographic survey of the tailings pile and other significant site features.
July 1, 2005	The START-2 submitted the final design and engineering specifications for the MMM site tailings pile cover to the EPA OSC.
July 5-6, 2005	The EPA received responses from Mr. Johnston and Federal Resources Corporation in regards to the UAO. Both parties informed the EPA that they did not have the financial resources to carry out the project specifications.
August 31, 2005	The EPA secured site access from Mr. Johnston for the removal action.
September 26, 2005	The EPA OSC and START-2 and ERRS personnel mobilized to the site. The ERRS contractor installed a silt fence and began reshaping the east bank of

	the tailings pile. The START-2 collected soil samples from a day care facility located approximately 0.25 miles east of the site and from the area surrounding the bunk house and former mill foundation.
September 27, 2005	The ERRS contractor continued reshaping the northeast bank of the tailings pile. The START-2 finished on-site soil sample collection, analyzed all soil samples on site, and demobilized from the site.
September 28-30, 2005	The ERRS contractor continued reshaping the northeast and northwest slope of tailings pile, removing trees as necessary, began excavating contaminated soils from the former mill area, and began transporting the tailings to the top of the tailings pile.
October 3-6, 2005	The ERRS contractor continued shaping the tailings pile. The EPA OSC, ERRS contractor, and Mr. Johnston investigated a new topsoil source located west of the site in Minnie Moore Gulch. The EPA OSC spoke with the Blaine County Roads and Bridges Supervisor about road requirements at the north end of the tailings pile. The EPA OSC wished to prevent traffic from driving onto the tailings pile at the sharp turn in Broadford Road at the north end of the pile. Blaine County agreed to install a warning sign at the corner while the EPA agreed to install a barbed wire fence along the north toe of the tailings pile. The ERRS contractor continued removing soil from the former mill area, employing a smaller excavator to remove soil from the foundation.
October 7, 2005	The ERRS contractor completed contaminated soil removal from the former mill area and completed the reshaping of the tailings pile.
October 10-15, 2005	The ERRS contractor placed cover material on top of the reshaped tailings pile, beginning with a 1-foot layer of clay material stockpiled at the site by Mr. Johnston. This material was compacted by driving on the material with loaded haul trucks. The final 1-foot layer of topsoil came from an on-site borrow area identified for use on October 5, 2005. Topsoil placement was completed on October 15, 2005.
October 17, 2005	The ERRS-subcontracted revegetation company began to broadcast fertilizer onto the cover, and applied the specified seed mix with a no-till drill seeder. Seed was spread by hand along the tailings pile toe. The ERRS contractor installed jute matting for erosion control over the seeded side slopes.
October 18, 2005	The ERRS contractor completed anchoring of jute matting and demobilized all but one person from the site. The EPA OSC demobilized from the site.
October 19, 2005	An ERRS subcontractor conducted a topographic survey of the tailings pile cover for record drawings. An ERRS fencing subcontractor installed 270 linear feet of three-strand barbed wire fence along Broadford Road at the north end of the tailings pile.
October 20, 2005	The ERRS contractor demobilized from the site.

4.3 REMOVAL ACTIONS

4.3.1 Site Reconnaissance

On April 15, 2005, two START-2 members visited the site with the EPA OSC to conduct a site reconnaissance. The objective of the reconnaissance was to:

- Obtain familiarity with the physical features and layout of the site;
- Assess site conditions (e.g., drainage) to determine site specific details necessary to prepare a removal design; and
- Evaluate the potential cover material source (i.e., topsoil) that the owner was importing and stockpiling on-site.

The START-2 visually inspected the tailings pile and surrounding areas to evaluate on-site drainage and slope stability. The inspection revealed that the top of the tailings pile lacked appropriate positive drainage, likely resulting in ponding atop the pile and infiltration of precipitation through the tailings. In addition, the pile side slopes were deemed to be excessively steep, unstable, and susceptible to erosion. The START-2 recommended that the side slopes be no steeper than 3 horizontal:1 vertical to minimize the erosion potential.

During the reconnaissance, the START-2 also collected a sample of the stockpiled topsoil that the owner proposed to use as cover material over the tailings pile. The material was imported from the construction site of Wood River Middle School. See subsection 5.1 for additional information regarding pre-design soil sampling.

4.3.2 Topographic Survey and Cap Design

In order to generate a basemap from which removal design plans could be developed, a topographic survey of the site was required. After a competitive procurement process, the START-2 subcontracted with White Shield, Inc., of Kennewick, Washington, to perform topographic surveying services at the site. The field survey was completed between June 2 and 4, 2005, and included topographic points of the following: tailings pile; watercourses; access roads; vegetation clusters; fence lines; existing stockpiled fill material; and structure (e.g., former mill, bunk house, and shop) footprints. Points from the field survey were then transferred into AutoCAD, and an electronic basemap of the site showing the specified site features and elevation contours was generated. This basemap then was used by the START-2 to develop design plans for construction of a tailings cover.

On July 1, 2005, the START-2 submitted a design package including engineering specifications and drawings for a tailings pile cover. The specifications followed the Construction Specifications

Institute (CSI) format and contained fourteen *Division 1 - Special Provisions* sections and six *Division 2 - Site Work* sections. The drawings contained four sheets including a *Title Sheet*, *Existing Site Layout*, *Subgrade Plan*; and *Final Grade Plan and Details*.

In general, the design consisted of grading the existing tailings pile (approximately 5.4 acres in plan), then covering the pile with two feet of clean soil and seeding with native herbaceous species (i.e., grasses and flowers). Grading contours were designed to achieve positive drainage over the entire pile to minimize infiltration of precipitation through the tailings, with side slopes no steeper than 3 horizontal:1 vertical to minimize erosion potential. The design subgrade contour elevations were developed using AutoCAD Land Desktop surface modeling to obtain a balance of cut and fill volumes over the tailings pile boundary. Final grade contours then were developed by adding two feet to the tailings pile subgrade surface, representing two feet of clean cover soil over the re-shaped tailings. The volume of soil needed to construct the cover was estimated to be approximately 17,500 cubic yards.

The design also included details and specifications for the installation of a demarcation layer (flexible orange safety/barrier warning fencing) between the reworked tailings and the two-foot cover; installation of erosion control netting atop slopes steeper than 10 horizontal:1 vertical; and applying seed (native grasses and flowers), fertilizer, and mulch to the soil cover.

4.3.3 Soil Excavation

In order to meet the removal action objectives for the MMM site, the EPA determined that removing soil containing greater than 700 mg/kg lead from around the on-site structures, disposing of these soils, providing a clean soil cover, and constructing a clean, permanent cover on the tailings pile were necessary. The 700 mg/kg cleanup level for lead-contaminated soils is consistent with residential cleanup levels used for other similar mine site cleanups in Region 10 (EPA 2005).

The top two feet of soil that exceeded 700 mg/kg of lead was excavated from the former mill area and driveways and was hauled to the tailings pile to be covered by the cap. Approximately 2,500 tons of soil were excavated and moved to the tailings pile. The excavation area was then backfilled with clean soil obtained from a clean on-site source provided by Minnie Moore Mine, Inc.

4.3.4 Tailings Pile Reconfiguration

Both prior to and after placement of the excavated soil on the tailings pile, the slopes of the pile were graded no steeper than 3H:1V (horizontal:vertical) and the regraded pile was compacted as required

in the design specifications for stability and to minimize erosion potential (E & E 2005b). Trees were removed from the tailings pile as necessary prior to placement of the excavated soils on the pile.

4.3.5 Cap Construction

Soils for capping the tailings pile were hauled from the existing stockpile of imported clay-like material obtained from the construction site at Wood River Middle School and placed as the initial one-foot cap on the tailings pile. An additional one foot of capping material obtained from an existing borrow source on the Minnie Moore property was then placed atop the imported clay-like material, resulting in a two-feet thick cap in total. After compacting the capping materials, drill-seeding took place over the side slopes and the top of the capped tailings pile. The side slopes were drill-seeded 0.125 inches below the surface, coir netting was placed over the slopes from the crest to the bottom of the pile for stability, then the top was drill seeded. The seed was purchased from Landmark Seed Company and had the following labels on the bags: "Noxious Weeds not found, Tested 10/05". After seeding, straw was applied on the slopes and top of the tailings pile. A three-strand wire fence then was installed along the north end of the pile along Broadford Road. After removal activities were completed, a Final Grade-Tailings Cap Record Drawing of the site (Appendix D) was created by Benchmark Associates, an ERRS subcontractor.

5. SAMPLE COLLECTION AND ANALYSIS

Prior to and at the beginning of the removal action, the START-2 was directed by the EPA OSC to collect on- and off-site soil samples. A total of 29 soil samples were collected by the START-2 to support removal action decisions. All samples were collected in accordance with the SSSP developed for the site and approved by the EPA OSC.

Prior to the removal action, the START-2 collected one sample of the material proposed for use as topsoil for the tailings pile cover (subsection 5.1).

At the beginning of the removal action, the START-2 collected three surface soil samples from a day care facility located about 0.25 miles east of the MMM site (subsection 5.2). The purpose of collecting these samples was to assess potential impacts to the property from the MMM site. The START-2 also collected 25 surface soil samples from the areas surrounding the former mill foundation and the bunk house to assess the extent of soil requiring removal from these areas (subsection 5.3).

5.1 PRE-DESIGN SOIL SAMPLING

On April 15, 2005, the START-2 collected one composite soil sample from the topsoil stockpiled on site by the property owner. The stockpiled topsoil was intended for use as cover material on the tailings pile. The EPA OSC tasked the START-2 with evaluating the stockpiled topsoil's usefulness as cover material.

The composite soil sample consisted of a total of two aliquots, collected from the stockpile located south of the tailings pile and from the stockpile northwest of the former mill remains. The sample aliquots were composited in a plastic bag and submitted to A & L Western Agricultural Laboratories for United States Department of Agriculture Texture Classification and soil fertility analysis.

Topsoil material analysis indicated that it was a clay loam consisting of 35 percent sand, 36 percent silt, and 29 percent clay (Appendix E). To optimize plant growth, A & L recommended that a fertilizer with the following components be used: 30 pounds per acre nitrogen (as nitrate nitrogen or ammonia nitrogen); 20 pounds per acre phosphate; 15 pounds per acre sulfur (as sulfate sulfur); and 1

pound per acre boron. Overall, the material stockpiled by the property owner was found to be well suited for use as topsoil for the tailings pile cover.

5.2 RESIDENTIAL SOIL SAMPLING

On September 26, 2005, START-2 collected three surface soil samples from the yard at the White Rabbit Day Care (WRDC) property located at 374 Broadford Road, roughly 0.25 mile east of the MMM site. The WRDC property is owned and operated by Laura Lucee, who also resides at the property. The EPA OSC tasked the START-2 to collect surface soil samples west of the house from the sand box (WRDC01SS01), from the gravel driveway (WRDC01SS02), and from a grassy area near the rabbit hutch (WRDC01SS03). Figure 5-1 shows the WRDC sample locations.

All three surface soil samples collected from the WRDC property were analyzed in the field using an Innov-X XRF instrument and also submitted to a commercial laboratory for TAL metals analysis by EPA SW-846 6000 and 7000 series methods. Both field and commercial laboratory analytical results indicated that lead concentrations in all three soil samples were less than the EPA Region 9 Preliminary Remediation Goal (PRG) for lead in residential soil (400 mg/kg; EPA 2004a). However, the concentration of arsenic found in all three soil samples (18.7 mg/kg, 15.4 mg/kg, and 55.5 mg/kg) exceeded the residential soil PRG of 0.39 mg/kg. The arsenic background concentrations in the area was determined to range between 12 and 27 mg/kg based on SI sampling results (Herrera 2004), therefore the WRDC soil results were not significantly above background concentrations. Table 5-1 presents the field laboratory and commercial laboratory analytical data for samples WRDC01SS01 through WRDC01SS03. The table includes all analytes that were able to be detected by the XRF but does not include commercial laboratory results for the following analytes that were not of concern at the MMM site: aluminum, beryllium, calcium, magnesium, nickel, potassium, sodium, thallium, and vanadium. The data validation memorandum for the commercial laboratory results is provided as Appendix A.

5.3 ON-SITE SOIL SAMPLING

On September 26 and 27, 2005, the START-2 collected surface soil samples from the area surrounding the former mill foundation to assess the extent of soil that would need to be removed from the area. All surface soil samples were collected using dedicated plastic scoops and were placed in clean, plastic bags for field analysis. All samples were collected in accordance with the SSSP (E & E 2005a).

Previous analytical data of soil samples collected from the former mill area indicated high concentrations of lead. A total of 25 surface soil samples (MMM01SS01 through MMM01SS25) were collected from the area surrounding the former mill foundation, including two surface soil samples collected on the east and west sides of the bunk house. Figure 5-2 shows the approximate on-site surface soil sample locations.

All on-site surface soil samples were analyzed in the field laboratory with the XRF instrument. Two on-site surface soil samples (MMM01SS03 and MMM01SS19) also were submitted to a commercial laboratory for confirmatory TAL metals analysis by EPA SW-846 6000 and 7000 series methods. The combination of field and commercial laboratory analytical results indicated that all but six on-site soil samples contained lead at concentrations exceeding the site-specific cleanup goal of 700 mg/kg. The six soil samples that were below the lead cleanup goal, MMM01SS02, MMM01SS04, MMM01SS06, MMM01SS07, MMM01SS21, and MMM01SS24, were collected from the west edge of the garden area and south of the former ore hopper foundation. The lead results for soil samples MMM01SS22 and MMM01SS23 exceeded the cleanup goal of 700 mg/kg, therefore the driveways on both sides of the bunk house also were excavated.

The following lists additional TAL metals that exceeded PRGs in addition to the number of exceedances for each metal:

- Antimony – 18 samples,
- Arsenic – 25 samples,
- Cadmium – 16 samples,
- Chromium – 1 sample,
- Copper – 1 sample,
- Iron – 25 samples,
- Lead – 20 samples,
- Manganese – 14 sample,
- Mercury – 1 sample, and
- Zinc – 9 samples.

Field and commercial laboratory analytical results are provided in Table 5-2. The table includes all analytes that were able to be detected by the XRF but does not include commercial laboratory results for the following analytes that were not of concern at the MMM site: aluminum, beryllium, calcium, magnesium, nickel, potassium, sodium, thallium, and vanadium. The data validation memorandum for

the two soil samples submitted to a commercial laboratory for confirmation analysis is provided in Appendix A.

TABLE 5-1

FIELD AND COMMERCIAL LABORATORY ANALYTICAL RESULTS
RESIDENTIAL SOIL SAMPLES
MINNIE MOORE MINE
BELLEVUE, IDAHO
(mg/kg)

Sample ID	EPA Region 9	050900001	050900001	050900001	050900001	050900002	050900002	050900002	050900002	050900003	050900003	050900003
Station ID	PRGs	WRDC01SS01	WRDC01SS01	WRDC01SS01	WRDC01SS01	WRDC01SS02	WRDC01SS02	WRDC01SS02	WRDC01SS02	WRDC01SS03	WRDC01SS03	WRDC01SS03
Run Number	Residential Soil	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 2
Antimony	31	67 U	22	65 U	97 UJ	68 U	70 U	0.84 UJ	63 U	64 U	1.9 UJ	55.5
Arsenic	0.39	16	514	347 U	94.2	563	392 U	107	457	348 U	126	2.1
Barium	5,400	35 U	121 U	110 U	0.71	36 U	129 U	0.7	34 U	34 U	118 U	27.3 J
Cadmium	37	121 U	109 U	19 U	19.8 J	118 U	139 U	30.1 J	110 U	117 U	5.6	19.9
Chromium	210	122 U	19 U	11.0	4.1	124 U	23	5.3	20 U	20 U	13.500	158
Copper	3,100	20 U	11,466	10,091	11.300	12,247	14,547	13.200	11,790	11,856	246	0.097
Iron	23,000	93	234	188	47.9	28	295	26.4	197	176	158	246
Lead	400	10 U	8 U	9 U	0.014 J	11 U	11 U	0.009 UJ	11 U	11 U	0.097	NA
Manganese	1,800	8 U	49 U	65	15.9 J	48 U	51 U	18.6 J	45 U	46 U	21.9 J	NA
Mercury	23	71	390	66	NA	73	81	NA	70	75	NA	NA
Molybdenum	390	3 U	3 U	3 U	1.1	3 U	3 U	0.93	3 U	3 U	1.5	1.1
Nickel	1,600	30 U	29 U	29 U	0.16	30 U	31 U	0.04 U	28 U	29 U	NA	NA
Rubidium	NA	197	180	180	NA	238	234	NA	164	181	NA	NA
Selenium	390	87	62 U	62 U	NA	64 U	67 U	NA	60 U	60 U	NA	NA
Silver	390	1,222	1,707	1,707	NA	1,272	2,333	NA	1,077	2,016	NA	NA
Strontium	47,000	121	121	121	95.3	69	80	77.3	319	276	280	NA
Tin	47,000	136	120	120	NA	122	139	NA	163	174	NA	NA
Titanium	100,000											
Zinc	23,000											
Zirconium	NA											

Note: Bolded values indicate results exceeding detection limits. Italicized values exceed EPA 2004 Region 9 PRGs for residential soil.

Key:

EPA = United States Environmental Protection Agency.

ID = identification.

J = The analyte was positively identified. The associated numerical result is an estimate.

mg/kg = milligrams per kilogram.

PRG = Preliminary Remediation Goal.

SS = surface soil.

U = The analyte was not detected. The associated numerical value is the sample quantitation limit.

UJ = The analyte was not detected. The reported detection limit is an estimate because quality control criteria were not met.

WRDC = White Rabbit Day Care

TABLE 5-2

FIELD AND COMMERCIAL LABORATORY ANALYTICAL RESULTS
ON-SITE SOIL SAMPLES
MINNIE MOORE MINE
BELLEVUE, IDAHO

Sample ID	EPA Region 9	Site-Specific	05090004	05090004	05090005	05090005	05090006	05090006	05090006
Station ID	PRGs	Cleanup Goal	MMM01SS01	MMM01SS01	MMM01SS02	MMM01SS02	MMM01SS03	MMM01SS03	MMM01SS03
Run Number	Residential Soil		Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Lab Run
Antimony	31	NA	72 U	74 U	71 U	71 U	72 U	73 U	264 J
Arsenic	0.39	NA	131	104	47	29	55	57	1,500
Barium	5,400	NA	699	823	486	577	949	911	96.4
Cadmium	37	NA	38 U	39 U	38 U	38 U	38 U	39 U	205
Chromium	210	NA	160 U	172 U	161 U	154 U	169 U	171 U	17.4 J
Cobalt	900	NA	223 U	225 U	214 U	204 U	222 U	228 U	5.0
Copper	3,100	NA	42	29	24 U	39	36	46	435
Iron	23,000	NA	33,624	33,793	31,828	29,206	34,111	35,139	54,600
Lead	400	700	677	732	189	192	401	385	20,000
Manganese	1,800	NA	774	847	721	629	754	752	5,810
Mercury	23	NA	15 U	16 U	13 U	12 U	13 U	15 U	5.1
Molybdenum	390	NA	9 U	9 U	9 U	9 U	9 U	9 U	NA
Nickel	1,600	NA	61 U	60 U	58 U	56 U	57 U	58 U	27.5 J
Rubidium	NA	NA	125	126	117	109	121	112	NA
Selenium	390	NA	5 U	5 U	4 U	3 U	4 U	4 U	12.5
Silver	390	NA	32 U	33 U	32 U	32 U	32 U	32 U	167
Strontium	47,000	NA	262	272	313	347	319	313	NA
Tin	47,000	NA	68 U	70 U	67 U	67 U	68 U	69 U	NA
Titanium	100,000	NA	3,864	4,978	4,623	3,846	3,705	4,023	NA
Zinc	23,000	NA	1,148	1,273	513	432	529	651	22,500
Zirconium	NA	NA	194	193	197	186	168	191	NA

Key is found on the last page.

TABLE 5-2

FIELD AND COMMERCIAL LABORATORY ANALYTICAL RESULTS
ON-SITE SOIL SAMPLES
MINNIE MOORE MINE
BELLEVUE, IDAHO
(mg/kg)

Sample ID	EPA Region 9	Site-Specific	05090007	05090007	05090008	05090008	05090009	05090009	05090010	05090010
Station ID	PRGs	Cleanup Goal	MMM01SS04	MMM01SS04	MMM01SS05	MMM01SS05	MMM01SS06	MMM01SS06	MMM01SS07	MMM01SS07
Run Number	Residential Soil		Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2
Antimony	31	NA	72 U	76 U	529	669 U	72 U	71 U	71 U	73 U
Arsenic	0.39	NA	58	64	10,174	9,132	15	17	33	28
Barium	5,400	NA	841	1,062	2,496	8,706 U	774	494 U	551	504 U
Cadmium	37	NA	38 U	41 U	325	422	38 U	38 U	38 U	39 U
Chromium	210	NA	167 U	176 U	629 U	2922 U	169	281	153 U	167 U
Cobalt	900	NA	226 U	243 U	833 U	3,693 U	214 U	215 U	208 U	225 U
Copper	3,100	NA	35	28	3,056	3,673	12	31	28	22
Iron	23,000	NA	34,646	37,880	104,874	116,388	33,068	33,326	29,481	34,036
Lead	400	700	294	638	60,367	62,975	73	69	99	94
Manganese	1,800	NA	706	830	5,401	3,642	685	633	686	734
Mercury	23	NA	12 U	15 U	170 U	627 U	14 U	12 U	13 U	13 U
Molybdenum	390	NA	9 U	15	30	72 U	9 U	9 U	9 U	9 U
Nickel	1,600	NA	61 U	63 U	219 U	786 U	58 U	58 U	57 U	60 U
Rubidium	NA	NA	87	99	30 U	128 U	100	81	130	127
Selenium	390	NA	4 U	5 U	62 U	268 U	4 U	4 U	3 U	4 U
Silver	390	NA	32 U	34 U	73 U	305 U	32 U	32 U	32 U	33 U
Strontium	47,000	NA	302	265	91	111	495	483	247	259
Tin	47,000	NA	69 U	72 U	143 U	621 U	68 U	68 U	68 U	70 U
Titanium	100,000	NA	4,896	4,371	4,794 U	19,540 U	5,750	6,210	4,420	5,462
Zinc	23,000	NA	470	663	74,073	75,853	201	237	307	285
Zirconium	NA	NA	246	191	24 U	96 U	175	156	208	164

Key is found on the last page.

TABLE 5-2

FIELD AND COMMERCIAL LABORATORY ANALYTICAL RESULTS
ON-SITE SOIL SAMPLES
MINNIE MOORE MINE
BELLEVUE, IDAHO
(mg/kg)

Sample ID	EPA Region 9	Site-Specific	050900011	050900011	050900012	050900012	050900013	050900013	050900014
Station ID	PRGs	Cleanup Goal	MMM01SS08	MMM01SS08	MMM01SS09	MMM01SS09	MMM01SS10	MMM01SS10	MMM01SS11
Run Number	Residential Soil		Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 2
Antimony	31	NA	880	728	240	238	535	432	1,272
Arsenic	0.39	NA	1,485	1,369	548	595	1,711	995	1,001
Barium	5,400	NA	1,922	1,187	1,099	938	2,189	1,705	1,400
Cadmium	37	NA	74	80	46	50	101	108	259
Chromium	210	NA	290 U	284 U	208 U	220 U	321 U	273 U	334 U
Cobalt	900	NA	417 U	387 U	280 U	284 U	416 U	362 U	432 U
Copper	3,100	NA	476	286	158	181	461	317	591
Iron	23,000	NA	78,085	73,672	49,425	47,803	70,093	60,353	68,876
Lead	400	700	11,059	9,147	4,328	4,597	13,287	10,447	11,577
Manganese	1,800	NA	6,530	6,894	2,338	2,978	4,073	3,760	5,748
Mercury	23	NA	48 U	44 U	26 U	28 U	56 U	43 U	63 U
Molybdenum	390	NA	18	13	9 U	10 U	23	12	22
Nickel	1,600	NA	97 U	90 U	70 U	72 U	103 U	90 U	109 U
Rubidium	NA	NA	59	57	67	59	98	93	40
Selenium	390	NA	17 U	15 U	9 U	10 U	19 U	15 U	18 U
Silver	390	NA	43 U	41 U	35 U	36 U	44 U	41 U	47 U
Strontium	47,000	NA	116	132	367	337	134	112	47
Tin	47,000	NA	105	80 U	84	75 U	94 U	84 U	96 U
Titanium	100,000	NA	2,411 U	2,666	3,757	4,588	2,528 U	2,260 U	2,500 U
Zinc	23,000	NA	17,119	15,979	6,056	6,634	21,556	14,471	55,299
Zirconium	NA	NA	127	76	137	185	102	102	110
									102

Key is found on the last page.

TABLE 5-2

FIELD AND COMMERCIAL LABORATORY ANALYTICAL RESULTS
ON-SITE SOIL SAMPLES
MINNIE MOORE MINE
BELLEVUE, IDAHO

Sample ID	EPA Region 9 PRGs	Site-Specific Cleanup Goal	05090015 Field Run 1	05090015 Field Run 2	05090016 Field Run 1	05090016 Field Run 2	05090017 Field Run 1	05090017 Field Run 2	05090018 Field Run 1	05090018 Field Run 2
Station ID			MMM01SS12	MMM01SS12	MMM01SS13	MMM01SS13	MMM01SS14	MMM01SS14	MMM01SS15	MMM01SS15
Run Number	Residential Soil									
Antimony	31	NA	1,576	1,214	1,560	1,728	1,775	1,798	1,540	1,759
Arsenic	0.39	NA	1,212	1,579	1,511	1,569	1,722	1,995	1,425	1,831
Barium	5,400	NA	1,656	1,539	2,410	1,957	2,696	1,889	1,430	1,458
Cadmium	37	NA	356	332	184	159	190	165	164	243
Chromium	210	NA	349 U	307 U	323 U	368 U	402 U	401 U	310 U	354 U
Cobalt	900	NA	456 U	408 U	443 U	473 U	509 U	508 U	449 U	455 U
Copper	3,100	NA	511	397	546	520	904	1,009	715	711
Iron	23,000	NA	77,526	65,471	71,899	82,319	79,328	77,613	71,983	70,080
Lead	400	700	16,394	12,453	19,131	18,195	31,076	36,203	23,385	25,497
Manganese	1,800	NA	8,789	5,976	6,239	6,827	7,992	7,908	6,336	6,865
Mercury	23	NA	64 U	58 U	65 U	64 U	85 U	90 U	70 U	74 U
Molybdenum	390	NA	12 U	21	23	19	23	25	22	24
Nickel	1,600	NA	108 U	101 U	106 U	112 U	125 U	128 U	112 U	118 U
Rubidium	NA	NA	42	53	54	40	33	18	32	40
Selenium	390	NA	22 U	19 U	24 U	23 U	31 U	34 U	26 U	27 U
Silver	390	NA	47 U	45 U	47 U	61	52 U	98	48 U	49 U
Strontium	47,000	NA	42	34	40	57	34	39	59	27
Tin	47,000	NA	96 U	92 U	90 U	99 U	107 U	109 U	99 U	99 U
Titanium	100,000	NA	2,609 U	2,357 U	2,594 U	2,802 U	2,988 U	3,002 U	2,518 U	2,588 U
Zinc	23,000	NA	38,378	34,617	28,830	25,223	31,924	28,970	27,381	29,285
Zirconium	NA	NA	91	72	52	53	51	37	58	60

Key is found on the last page.

TABLE 5-2

FIELD AND COMMERCIAL LABORATORY ANALYTICAL RESULTS
ON-SITE SOIL SAMPLES
MINNIE MOORE MINE
BELLEVUE, IDAHO

			(mg/kg)									
Sample ID	EPA Region 9	Site-Specific	05090019	05090019	05090020	05090020	05090021	05090021	05090022	05090022	05090022	
Run Number	PRGs	Cleanup Goal	MMM01SS16	MMM01SS16	MMM01SS17	MMN01SS17	MMM01SS18	MMN01SS18	MMM01SS19	MMM01SS19	MMM01SS19	
	Residential Soil		Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 2	
Antimony	31	NA	1,492	1,692	1,401	1,742	82	76 U	104	139	13.3 J	
Arsenic	0.39	NA	1,565	1,302	1,952	1,666	251	254	763	792	2,680	
Barium	5,400	NA	1,502	1,835	2,198	1,987	1,016	934	869	794	175	
Cadmium	37	NA	245	258	210	242	38 U	41 U	47	41 U	54.0	
Chromium	210	NA	333 U	333 U	323 U	374 U	173 U	182 U	191 U	194 U	25.9 J	
Cobalt	900	NA	437 U	442 U	427 U	509 U	239 U	260 U	245 U	230 U	9.0	
Copper	3,100	NA	635	688	600	894	83	90	124	95	99.0	
Iron	23,000	NA	69,398	68,641	69,441	81,799	41,488	41,733	36,077	32,446	29,900	
Lead	400	700	21,344	21,748	16,870	26,889	1,673	1,715	3,730	3,473	3,560	
Manganese	1,800	NA	6,590	6,814	6,761	7,664	1,357	1,450	1,293	1,294	1,300	
Mercury	23	NA	70 U	73 U	65 U	81 U	18 U	20 U	28 U	26 U	1.8	
Molybdenum	390	NA	23	14	23	23	16	13	13	10 U	NA	
Nickel	1,600	NA	111 U	113 U	110 U	121 U	62 U	67 U	66 U	66 U	19.8 J	
Rubidium	NA	NA	45	44	61	29	115	116	125	135	NA	
Selenium	390	NA	24 U	25 U	22 U	29 U	6 U	7 U	9 U	9 U	4.4	
Silver	390	NA	48 U	49 U	47 U	52 U	32 U	34 U	35 U	35 U	22.1	
Strontium	47,000	NA	47	35	39	25	200	192	252	171	NA	
Tin	47,000	NA	98 U	98 U	97 U	106 U	68 U	72 U	74 U	94	NA	
Titanium	100,000	NA	2,611 U	2,651 U	2,562 U	2,872 U	3,670	3,657	3,626	3,335	NA	
Zinc	23,000	NA	31,812	36,915	31,620	37,760	1,883	1,971	8,138	8,223	10,700	
Zirconium	NA	NA	46	71	73	47	129	121	162	168	NA	

Key is found on the last page.

TABLE 5-2

FIELD AND COMMERCIAL LABORATORY ANALYTICAL RESULTS
ON-SITE SOIL SAMPLES
MINNIE MOORE MINE
BELLEVUE, IDAHO
(mg/kg)

Sample ID	EPA Region 9	Site-Specific	05090023	05090023	05090024	05090024	05090025	05090025
Station ID	PRGs	Cleanup Goal	MMM01SS20	MMM01SS20	MMM01SS21	MMM01SS21	MMM01SS22	MMM01SS22
Run Number	Residential Soil		Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2
Antimony	31	NA	1,709	1,326	74 U	74 U	146	120
Arsenic	0.39	NA	1,406	1,151	14 U	38	176	165
Barium	5,400	NA	1,919	1,853	1,190	1,289	889	1,145
Cadmium	37	NA	574	434	39 U	39 U	40 U	39 U
Chromium	210	NA	418 U	371 U	187 U	185 U	170 U	184
Cobalt	900	NA	545 U	448 U	258 U	251 U	225 U	208 U
Copper	3,100	NA	689	492	29	24 U	65	61
Iron	23,000	NA	91,476	74,874	46,030	43,290	33,359	30,052
Lead	400	700	16,241	13,072	141	150	1,914	1,620
Manganese	1,800	NA	7,808	8,354	862	947	984	818
Mercury	23	NA	78 U	65 U	13 U	12 U	21 U	18 U
Molybdenum	390	NA	26	21	9 U	9 U	11	16
Nickel	1,600	NA	133 U	116 U	63 U	62 U	84	59 U
Rubidium	NA	NA	44	45	69	65	102	102
Selenium	390	NA	24 U	19 U	4 U	4 U	7 U	6 U
Silver	390	NA	52 U	48 U	33 U	33 U	34 U	33 U
Strontium	47,000	NA	39	33	519	507	164	193
Tin	47,000	NA	104 U	100 U	70 U	82	102	92
Titanium	100,000	NA	3,076 U	2,725 U	6,538	7,180	3,231	2,875
Zinc	23,000	NA	73,184	51,605	434	529	3,332	2,495
Zirconium	NA	NA	92	90	151	143	120	97

Key is found on the last page.

TABLE 5-2

FIELD AND COMMERCIAL LABORATORY ANALYTICAL RESULTS
ON-SITE SOIL SAMPLES
MINNIE MOORE MINE
BELLEVUE, IDAHO
(mg/kg)

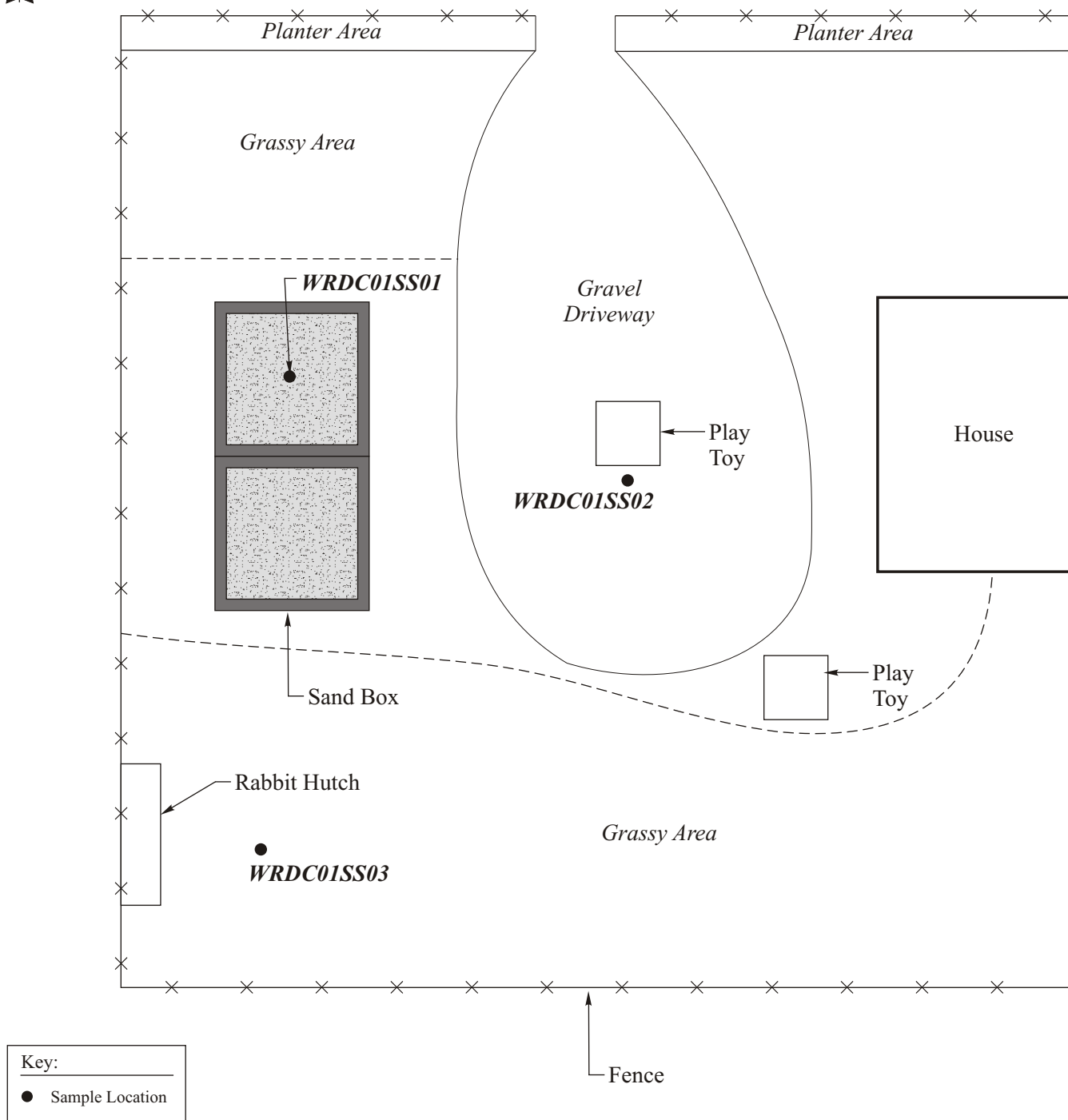
Sample ID	EPA Region 9	Site-Specific	05090026	05090026	05090027	05090027	05090028	05090028
Station ID	PRGs	Cleanup Goal	MMM01SS23	MMM01SS23	MMM01SS24	MMM01SS24	MMM01SS25	MMM01SS25
Run Number	Residential Soil		Field Run 1	Field Run 2	Field Run 1	Field Run 2	Field Run 1	Field Run 2
Antimony	31	NA	92	74 U	72 U	71 U	87 U	106
Arsenic	0.39	NA	132	103	57	54	7,559	8,111
Barium	5,400	NA	735	884	1,279	764	898	785 U
Cadmium	37	NA	39 U	39 U	38 U	38 U	60	85
Chromium	210	NA	155 U	176 U	167 U	155 U	295	280 U
Cobalt	900	NA	208 U	217 U	318	220 U	429 U	443 U
Copper	3,100	NA	69	54	48	39	181	193
Iron	23,000	NA	30,016	31,087	34,924	33,795	88,153	90,557
Lead	400	700	1,137	1,370	327	398	1,753	1,958
Manganese	1,800	NA	1,158	1,457	785	744	3,651	2,597
Mercury	23	NA	17 U	17 U	13 U	13 U	65	46 U
Molybdenum	390	NA	9 U	9 U	10	9 U	14	14
Nickel	1,600	NA	59 U	62 U	57 U	59 U	86 U	89 U
Rubidium	NA	NA	99	132	93	93	81	88
Selenium	390	NA	5 U	5 U	4 U	5 U	12 U	13 U
Silver	390	NA	32 U	33 U	32 U	32 U	40 U	41 U
Strontium	47,000	NA	297	243	273	240	129	123
Tin	47,000	NA	80	69 U	68 U	68 U	83 U	86 U
Titanium	100,000	NA	4,029	3,847	4,013	4,839	2,258	3,144
Zinc	23,000	NA	2,268	2,372	893	802	4,101	7,306
Zirconium	NA	NA	164	176	155	149	83	94

Key is found on the last page.

Note: Bolded values indicate results exceeding detection limits. Italicized values exceed EPA Region 9 PRGs for residential soil. Underlined values indicate results exceeding site-specific cleanup goals.

Key:

- EPA = United States Environmental Protection Agency.
- ID = identification.
- J = The analyte was positively identified. The associated numerical result is an estimate.
- mg/kg = milligrams per kilogram.
- MMM = Minnie Moore Mine
- PRG = Preliminary Remediation Goal.
- SS = surface soil.
- U = The analyte was not detected. The associated numerical value is the sample quantitation limit.
- UJ = The analyte was not detected. The reported detection limit is an estimate because quality control criteria were not met.



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MINNIE MOORE MINE SITE
REMOVAL ACTION
Blaine County, Idaho

Not to Scale

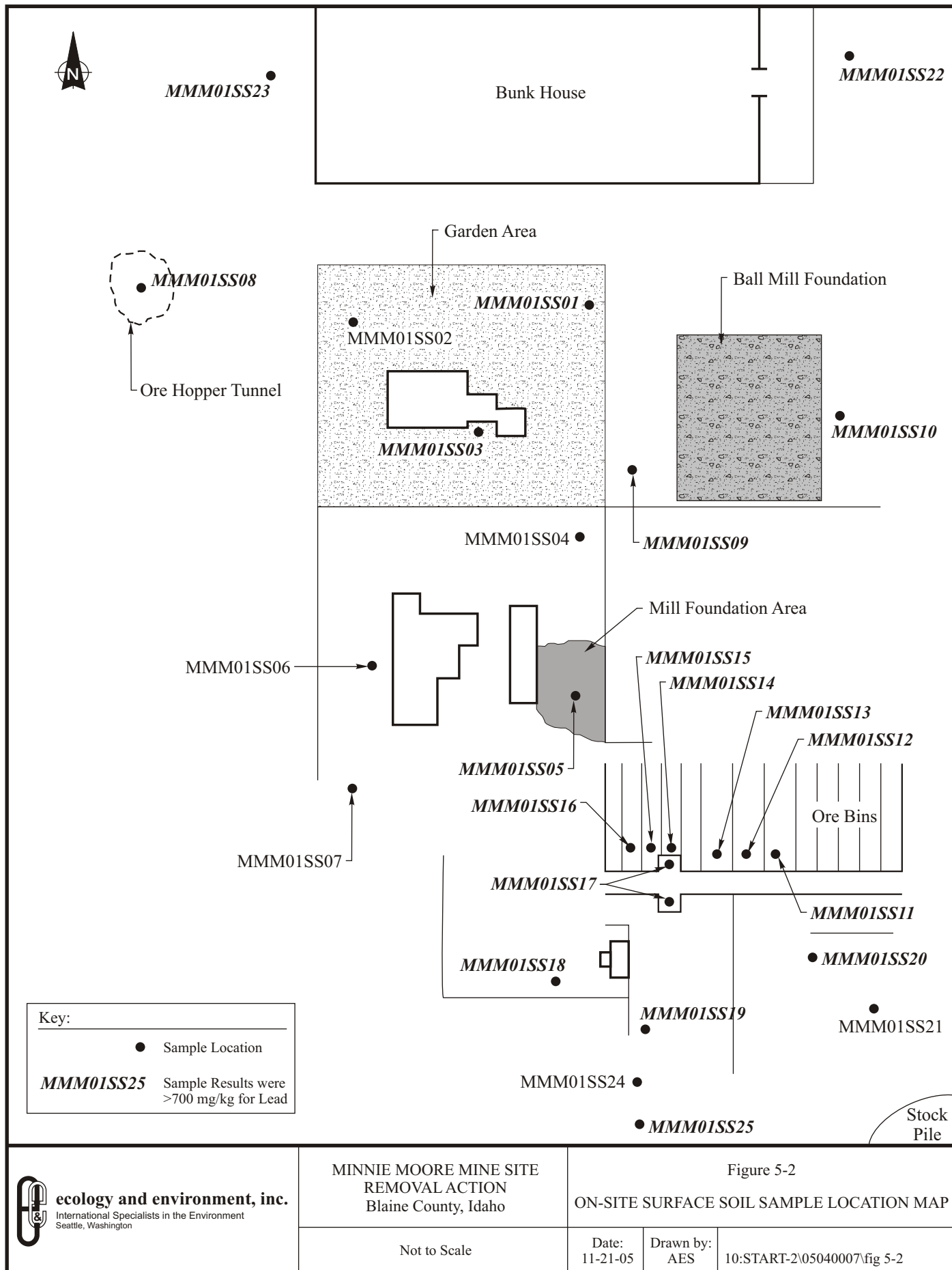
Figure 5-1

RESIDENTIAL SOIL SAMPLE LOCATION MAP

Date:
11-28-05

Drawn by:
AES

10:START-2\05040007\fig 5-1



6. COMMUNITY RELATIONS

Communications with the public, community officials, and state agency representatives occurred prior to and throughout the duration of removal activity. Media coverage of removal activities were limited. The OSC gave two on-site interviews to local newspapers, the Idaho Mountain Express and the Wood River Journal, during the removal action. A press release was issued by the EPA to local media prior to the initiation of removal activities. The OSC met with the property owner and nearby residential property owners, city council members, local government officials, the Bellevue City Administrator, and state agency representatives to listen to their concerns, answer questions, and update them regarding site activities. The EPA OSC also set up a website (<http://www.epaosc.org/MinnieMooreMine>) to share information about the site with the general public. A copy of the content available on the website for the Minnie Moore Mine site is provided as Appendix F.

7. HEALTH AND SAFETY

The EPA OSC maintained ultimate authority and responsibility for site safety during the removal action; however, the START-2 and the ERRS contractors developed and implemented site-specific safety plans tailored to their individual SOWs and followed these plans as directed.

Daily safety meetings discussing chemical and physical hazards associated with the day's activities were conducted each morning before work began. Subcontractors and visitors to the site were made aware of the potential hazards at the site and precautions to take to avoid injury.

Physical hazards at the site included heavy equipment operation, traffic, and excavation hazards. Protective clothing worn during work activities included steel toe/shank boots and hard hats. Chemical resistant gloves were worn while collecting samples from on-site areas.

The chemical hazards at the site consisted primarily of heavy-metal-laden particulate matter. Misting via a 4,000-gallon water truck was used to provide dust control. Wood chips were placed at the site entrance and on the ramp up to the tailings pile to prevent tailings from leaving the site on the tires of the haul trucks. No accidents or major injuries occurred during the removal action.

8. COST SUMMARY

The Minnie Moore Mine Removal Action has a ceiling of \$380,000. Estimated cost summaries and ceilings for the START-2 and the ERRS contractors as of December 18, 2005, are shown below. The costs reported below are not final as of the time of this report. The below accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

	Cost to Date	Ceiling Costs
ERRS \$	281,755	\$ 330,000
START \$	<u>45,181</u>	<u>\$ 50,000</u>
Total \$	326,936	\$ 380,000

9. EFFECTIVENESS OF REMOVAL ACTION

The objectives of the removal action that took place at the Minnie Moore Mine site in Bellevue, Idaho, between September 26, 2005 and October 20, 2005, were to mitigate the potential threats to human health and the environment posed by the heavy metals-contaminated soils at the site and to reduce the potential of metal-laden tailings material to migrate off-site through wind and surface water erosion. To meet these objectives, 2,500 tons of soil contaminated with lead at concentrations exceeding 700 mg/kg were removed from the areas surrounding the former mill foundation and bunk house. This soil was placed on top of the tailings pile which was then reshaped, covered with 2 feet of clean topsoil, and vegetated with native plants. The excavated areas were backfilled with clean fill. The removal action has successfully accomplished the tasks of isolating the exposed tailings from human contact and hydraulic erosion, minimizing the infiltration of precipitation and runoff water through the tailings pile, and minimizing the leaching of contaminants from the tailings pile to surface water and ground water.

10. REFERENCES

- Ecology and Environment, Inc. (E & E), September 7, 2005a, *Minnie Moore Mine Site Removal Action Site Specific Sampling Plan*, prepared for EPA Region 10 under Contract Number 68-S0-01-01, Technical Direction Document (TDD) Number 05-04-0007.
- _____, July 1, 2005b, *Minnie Moore Mine Site Tailings Pile Cover Engineering Specifications and Drawings*, prepared for EPA Region 10 under Contract Number 68-S0-01-01 TDD Number 05-04-0007.
- Herrera Environmental Consultants (HEC), February 14, 2004, Site Inspection Report, Minnie Moore Mine Site, Blaine County, Idaho, prepared for the United States Environmental Protection Agency, Contract Number 68-S0-01-03.
- Idaho Department of Water Resources (IDWR), October 1990, "Geothermal Resource Analysis in the Big Wood River Valley, Blaine County, Idaho", *Idaho Department of Water Resources Water Information Bulletin No. 30 Part 17*, Boise, Idaho.
- United States Environmental Protection Agency (EPA), May 23, 2005, *Request for Approval of Time-Critical Removal Action at Minnie Moore Mine Site, Bellevue, Idaho*, memorandum to Daniel D. Opalski, Director, Office of Environmental Cleanup, from Greg Weigel, On-Scene Coordinator.
- _____, October 2004a, *USEPA Region 9 Preliminary Remediation Goals*.
- _____, October 2004b, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-45, EPA 540-R-04-004.
- _____, March 2004c, *USEPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-Media, Multi-Concentration*, ILM05.3.
- _____, August 2000, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, Office of Research and Development, Washington, D.C., EPA/600/R-96/055.
- _____, April 1990, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures, Interim Final*, EPA/540/G-90/004, OSWER Directive 9360.4-01.
- United States Federal Emergency Management Agency (FEMA), April 20, 2000, Blaine County, Idaho, Flood Insurance Rate Map.
- Western Regional Climate Center (WRCC), October 2005, Period of Record Monthly Climate Summary for Hailey, Idaho, <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?idhail>.

APPENDIX A
DATA VALIDATION MEMORANDUM



ecology and environment, inc.

International Specialists in the Environment

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Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: October 14, 2005

TO: Suzanne Dolberg, Project Manager, E & E, Seattle, Washington *MD*

FROM: Mark Woodke, START-Chemist, E & E, Seattle, Washington

SUBJ: **Inorganic Data Quality Assurance Review,
Minnie Moore Mine Site, Blaine County, Idaho**

REF: TDD: 05-04-0007 PAN: 001281.0480.01SF

The data quality assurance review of five soil samples collected from the Minnie Moore Mine site in Blaine County, Idaho, has been completed. Target Analyte List (TAL) metals analyses (EPA 6000 and 7000 Series Methods) were performed by Laucks Testing Laboratories, Inc., Seattle, Washington.

The samples were numbered:

WRDC01SS01 WRDC01SS02 WRDC01SS03 MMM01SS03 MMM01SS19

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained at 4°C (\pm 2°C). The samples were collected on September 26 or 27, 2005, and were analyzed by October 6, 2005, therefore meeting QC criteria of less than 6 months between collection, extraction, and analysis (28 days for mercury).

2. Initial and Continuing Calibration: Acceptable.

A minimum of one calibration standard and a blank were analyzed at the beginning of the ICP analysis sequence and after every 10 samples. No results were greater than 110% of the highest calibration standard. All ICP recoveries were within the QC limits of 90% to 110%. All AA recoveries were within QC limits of 80% to 120%.

3. Blanks: Satisfactory.

A preparation blank was analyzed for each 20 samples or per matrix per concentration level. Blanks were analyzed after each Initial or Continuing Calibration Verification. The following elements

were detected in the applicable calibration and/or preparation blanks:

Blank	Element	Concentration
Preparation Blank	Mercury	-0.095 mg/kg
	Antimony	1.166 mg/kg
	Beryllium	0.167
Continuing Calibration Blank 2	Sodium	-130.9 ug/L

Associated sample results were qualified as not detected (U) if the sample result was less than five times the positive blank concentration. Associated sample results were qualified as estimated quantities (J or UJ) if the sample result was less than five times the absolute value of the negative blank concentration.

4. ICP Interference Check Sample: Acceptable.

An Interference Check Sample (ICS) was analyzed at the beginning and end of each sequence or at least twice every 8 hours, whichever was more frequent. All ICS (solution AB) results were within QC limits of 80% - 120% recovery.

5. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

6. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

7. ICP Serial Dilution: Satisfactory.

A serial dilution analysis was performed per matrix per concentration or per sample delivery group, whichever was more frequent. All serial dilution results were within QC limits except magnesium, nickel and potassium. Associated sample results were qualified as estimated quantities (J or UJ).

8. Matrix Spike Analysis: Satisfactory.

A matrix spike analysis was performed per SDG or per matrix per concentration level, whichever was more frequent. Spike and spike duplicate recoveries were within the QC limits except antimony (low recovery) and chromium (high recovery). Sample results associated with the low recovery outlier were qualified as estimated quantities (J or UJ). Positive sample results associated with the high recovery outlier were qualified as estimated quantities (J).

9. Duplicate Analysis: Satisfactory.

A laboratory duplicate analysis was performed per SDG or per matrix per concentration level,

whichever was more frequent. All duplicate results were within QC limits except chromium. Associated sample results were qualified as estimated quantities (J or UJ).

10. Laboratory Control Sample Analysis: Acceptable.

A Laboratory Control Sample (LCS) was analyzed per SDG per matrix. All LCS results were within the established control limits.

11. Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical methods, and, when applicable, the Office of Emergency and Remedial Response Publication "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

- J - The associated numerical value is an estimated quantity because the reported concentrations were less than the sample detection limits but greater than the instrument detection limits or because quality control criteria limits were not met.
- U - The material was analyzed for but was not detected. The associated numerical value is the sample quantitation limit.
- UJ - The material was analyzed for, but not detected. The reported detection limit is estimated because quality control criteria were not met.

SW 846

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

WRDC01SS01

Lab Name: LAUCKS Testing Laboratories Contract: Ecology and EnviLab Code: LAUCKS Case No.: 05-04-00 SAS No.: _____ SDG No.: EE006Matrix (soil/water): SOIL Lab Sample ID: 0509397-01Level (low/med): LOW Date Received: 9/28/05% Solids: 96.0Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6270			P
7440-36-0	Antimony	0.97	ENV	U	P
7440-38-2	Arsenic	18.7			P
7440-39-3	Barium	94.2			P
7440-41-7	Beryllium	0.43	U		P
7440-43-9	Cadmium	0.71	ENV	U	P
7440-70-2	Calcium	3010			P
7440-47-3	Chromium	19.8	J	ENV	P
7440-50-8	Copper	11.0			P
7440-48-4	Cobalt	4.1			P
7439-89-6	Iron	11300			P
7439-92-1	Lead	47.9			P
7439-95-4	Magnesium	3460	J	ENV	P
7439-96-5	Manganese	158			P
7440-02-0	Nickel	15.9	J	ENV	P
7440-09-7	Potassium	1160	J	ENV	P
7782-49-2	Selenium	1.1			P
7439-97-6	Mercury	0.014	ENV	J	CV
7440-22-4	Silver	0.16	ENV		P
7440-23-5	Sodium	7.9	U	J	P
7440-28-0	Thallium	1.4	U		P
7440-62-2	Vanadium	31.4			P
7440-66-6	Zinc	95.3			P

Color Before: Brown

Clarity Before: _____

Texture: MediumColor After: Yellow

Clarity After: _____

Artifacts: _____

Comments: _____

SW 846

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

WRDC01SS02

Lab Name: LAUCKS Testing Laboratories Contract: Ecology and EnviLab Code: LAUCKS Case No.: 05-04-00 SAS No.: _____ SDG No.: EE006Matrix (soil/water): SOIL Lab Sample ID: 0509397-02Level (low/med): LOW Date Received: 9/28/05% Solids: 99.4Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9120			P
7440-36-0	Antimony	0.84	U	U	P
7440-38-2	Arsenic	15.4			P
7440-39-3	Barium	107			P
7440-41-7	Beryllium	0.52	U		P
7440-43-9	Cadmium	0.70	U	U	P
7440-70-2	Calcium	9490			P
7440-47-3	Chromium	30.1	U	U	P
7440-50-8	Copper	13.1			P
7440-48-4	Cobalt	5.3			P
7439-89-6	Iron	13200			P
7439-92-1	Lead	26.4			P
7439-95-4	Magnesium	5040	U	U	P
7439-96-5	Manganese	200			P
7440-02-0	Nickel	18.6	U	U	P
7440-09-7	Potassium	1830	U	U	P
7782-49-2	Selenium	0.93			P
7439-97-6	Mercury	0.009	U	U	CV
7440-22-4	Silver	0.04	U		P
7440-23-5	Sodium	7.5	U		P
7440-28-0	Thallium	0.28	U		P
7440-62-2	Vanadium	38.2			P
7440-66-6	Zinc	77.3			P

Color Before: Brown

Clarity Before: _____

Texture: MediumColor After: Yellow

Clarity After: _____

Artifacts: _____

Comments: _____

SW 846

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

WRDC01SS03

Lab Name: LAUCKS Testing Laboratories Contract: Ecology and EnviLab Code: LAUCKS Case No.: 05-04-00 SAS No.: _____ SDG No.: EE006Matrix (soil/water): SOIL Lab Sample ID: 0509397-03Level (low/med): LOW Date Received: 9/28/05% Solids: 83.2Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9410			P
7440-36-0	Antimony	1.9	U	U	P
7440-38-2	Arsenic	55.5			P
7440-39-3	Barium	126			P
7440-41-7	Beryllium	0.57	U		P
7440-43-9	Cadmium	2.1			P
7440-70-2	Calcium	5540		U	P
7440-47-3	Chromium	27.3	U	U	P
7440-50-8	Copper	19.9			P
7440-48-4	Cobalt	5.6			P
7439-89-6	Iron	13500			P
7439-92-1	Lead	158			P
7439-95-4	Magnesium	5210	U	U	P
7439-96-5	Manganese	246			P
7440-02-0	Nickel	21.9	U	U	P
7440-09-7	Potassium	2160	U	U	P
7782-49-2	Selenium	1.5			P
7439-97-6	Mercury	0.097			CV
7440-22-4	Silver	1.1			P
7440-23-5	Sodium	9.9	U	U	P
7440-28-0	Thallium	1.8	U	U	P
7440-62-2	Vanadium	42.1			P
7440-66-6	Zinc	280			P

Color Before: BrownClarity Before: 10/14/05Texture: MediumColor After: Yellow

Clarity After: _____

Artifacts: _____

Comments: _____

SW 846

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MMM01SS03

Lab Name: LAUCKS Testing Laboratories Contract: Ecology and EnviLab Code: LAUCKS Case No.: 05-04-00 SAS No.: _____ SDG No.: EE006Matrix (soil/water): SOIL Lab Sample ID: 0509397-04Level (low/med): LOW Date Received: 9/28/05% Solids: 95.1Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8200			P
7440-36-0	Antimony	264	JLW		P
7440-38-2	Arsenic	1500			P
7440-39-3	Barium	96.4			P
7440-41-7	Beryllium	0.67	U		P
7440-43-9	Cadmium	205			P
7440-70-2	Calcium	29900	JLW		P
7440-47-3	Chromium	17.4	JLW		P
7440-50-8	Copper	435			P
7440-48-4	Cobalt	5.0			P
7439-89-6	Iron	54600			P
7439-92-1	Lead	20000			P
7439-95-4	Magnesium	7270	JLW		P
7439-96-5	Manganese	5810			P
7440-02-0	Nickel	27.5	JLW		P
7440-09-7	Potassium	2180	JLW		P
7782-49-2	Selenium	12.5			P
7439-97-6	Mercury	5.1			CV
7440-22-4	Silver	167			P
7440-23-5	Sodium	843	UJ		P
7440-28-0	Thallium	30.9	U		P
7440-62-2	Vanadium	86.9			P
7440-66-6	Zinc	22500			P

Color Before: BrownClarity Before: 10-14-05Texture: MediumColor After: Yellow

Clarity After: _____

Artifacts: _____

Comments: _____

SW 846

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MMM01SS19

Lab Name: LAUCKS Testing Laboratories Contract: Ecology and EnviLab Code: LAUCKS Case No.: 05-04-00 SAS No.: _____ SDG No.: EE006Matrix (soil/water): SOIL Lab Sample ID: 0509397-05Level (low/med): LOW Date Received: 9/28/05% Solids: 98.4Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11700			P
7440-36-0	Antimony	13.3	JTW		P
7440-38-2	Arsenic	2680			P
7440-39-3	Barium	275			P
7440-41-7	Beryllium	0.61	U		P
7440-43-9	Cadmium	54.0			P
7440-70-2	Calcium	9440	JTW		P
7440-47-3	Chromium	25.9	JTW		P
7440-50-8	Copper	99.0			P
7440-48-4	Cobalt	9.0			P
7439-89-6	Iron	29900			P
7439-92-1	Lead	3560			P
7439-95-4	Magnesium	5340	JTW		P
7439-96-5	Manganese	1300			P
7440-02-0	Nickel	19.8	JTW		P
7440-09-7	Potassium	3280	JTW		P
7782-49-2	Selenium	4.4			P
7439-97-6	Mercury	1.8			CV
7440-22-4	Silver	22.1			P
7440-23-5	Sodium	808	U		P
7440-28-0	Thallium	3.0	U		P
7440-62-2	Vanadium	48.7			P
7440-66-6	Zinc	10700			P

Color Before: Brown

Clarity Before: _____

Texture: MediumColor After: Yellow

Clarity After: _____

Artifacts: _____

Comments: _____

APPENDIX B
PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPH IDENTIFICATION SHEET

Camera Serial No. Disposable Camera

TDD No. 05-04-0007

Lens Type: 35 millimeter

Site Name: Minnie Moore Mine

Photo	Date	By	Direction	Description
1	7-31-05	SD	Southwest	Entrance to White Rabbit Day Care Center.
2	7-31-05	SD	Southeast	Entrance and home - White Rabbit Day Care.
3	7-31-05	SD	Southwest	Play area at White Rabbit Day Care
4	7-31-05	SD	Southeast	Another view of White Rabbit Day Care.
5	7-31-05	SD	South	Entrance driveway at White Rabbit Day Care.
6	7-31-05	SD	Southwest	Sample 05090001 with sand box at White Rabbit Day Care.
7	7-31-05	SD	Down	Closer view of sample 05090001.
8	7-31-05	SD	North	Sample 05090002 at White Rabbit Day Care.
9	7-31-05	SD	Down	Closer view of sample 05090002.
10	7-31-05	SD	South	Sample 05090003 at White Rabbit Day Care.
11	7-31-05	SD	Down	Closer view of sample 05090003.
12	7-31-05	SD	West	Sample 05090004 collected from old mill foundation.
13	7-31-05	SD	West	Closer view of sample 05090004.
14	7-31-05	SD	South	Sample 05090005 collected from old mill foundation.
15	7-31-05	SD	Down	Closer view of sample 05090005.
16	7-31-05	SD	East	Sample 05090006 collected from old mill foundation.
17	7-31-05	SD	West	Sample 05090007 collected from south mill foundation.
18	7-31-05	SD	South	Sample 05090008 collected from south mill foundation.
19	7-31-05	SD	Down	Closer view of sample 05090008.
20	7-31-05	SD	North	Sample 05090009 collected from south mill foundation.
21	7-31-05	SD	North	Sample 05090010 collected from south mill foundation.
22	7-31-05	SD	Southeast	Sample 05090011 collected from ore hopper tunnel.
23	7-31-05	SD	Southeast	Overview of old mill and south mill foundation.
24	7-31-05	SD	East	Sample 05090012 collected from west side of ball mill foundation.
25	7-31-05	SD	West	Sample 05090013 collected from east side of ball mill foundation.
26	7-31-05	SD	South	Samples 05090014-05090016 collected from ore bins 5, 6, and 7.
27	7-31-05	SD	South	Samples 05090017 &-05090018 collected from ore bins 9 and 10.

Key is on the next page.

PHOTOGRAPH IDENTIFICATION SHEET

Camera Serial No. Disposable Camera

TDD No. 05-04-0007

Lens Type: 35 millimeter

Site Name: Minnie Moore Mine

Photo	Date	By	Direction	Description
28	7-31-05	SD	South	Sample 05090019 collected from ore bin 1.
29	7-31-05	SD	East	Hallway between ore bins 14 and 15.
30	7-31-05	SD	North	Sample 05090020 collected from hallway between ore bins.
31	7-31-05	SD	East	Sample 05090021 collected west of the old ore bin structure.
32	7-31-05	SD	North	Sample 05090022 collected from south of the old ore bin structure.
33	7-31-05	SD	North	Closer view of sample 05090023.
34	7-31-05	SD	West	Sample 05090023 collected at south end of the old ore bin structure.
35	7-31-05	SD	West	Closer view of sample 05090023.
36	7-31-05	SD	Northwest	Sample 05090024 located north of the pit run stockpile next to the access road and south of the ore bin structure.
37	7-31-05	SD	West	Sample 05090025 located in front of the east entrance to bunk house.
38	7-31-05	SD	East	Sample 05090026 located in front of the west entrance to bunk house.
39	7-31-05	SD	West	Sample 05090027 located south of sample 05090022.
40	7-31-05	SD	North	Samples 05090028 (foreground) and 05090027.
41	7-31-05	SD	East	Sample 05090028 collected from the pit run stockpile.
42	7-31-05	SD	South	East side of tailings pile before regrading.
43	7-31-05	SD	North	ERRS regrading east slope of tailings pile.
44	7-31-05	SD	North	ERRS regrading east slope of tailings pile.
45	7-31-05	SD	South	East slope after regrading.
46	7-31-05	SD	East	Area where cap will tie in with natural slope.
47	7-31-05	SD	Northeast	ERRS preparing area for the
48	7-31-05	SD	East	Area where extra capping and vegetation is needed. Located at the center of the east bank.
49	7-31-05	SD	East	Area where extra capping and vegetation is needed. Located at the center of the east bank.
50	7-31-05	SD	Northwest	Top of the tailings pile as reshaping is occurring.

Key:

ERRS = Emergency and Rapid Response Services.

SD = Suzanne Dolberg.



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9

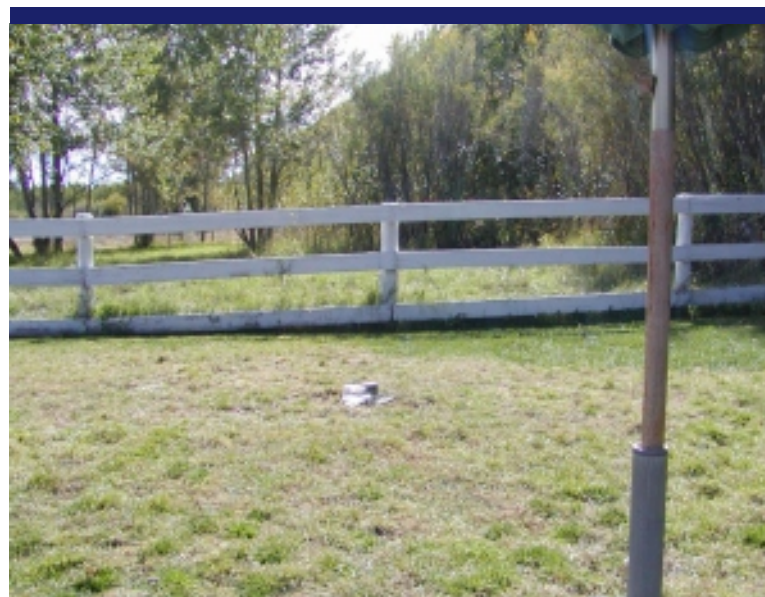


Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18



Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40



Photo 41



Photo 42



Photo 43



Photo 44



Photo 45



Photo 46



Photo 47



Photo 48



Photo 49



Photo 50

APPENDIX C
POLLUTION REPORTS

[All POLREPs for this site](#)

Minnie Moore Mine
Bellevue, ID - EPA Region X
POLREP #1 - Initiation of Action

[Printer Friendly](#)**On-Scene Coordinator - Greg Weigel**

9/

Time-Critical - Removal Action**Pollution Report (POLREP)****Start Date: 9/26/2005**

Site Description

The Minnie Moore Mine produced about \$7 million worth of silver ore 1881 and 1887. In 1927, the mine was abandoned, buildings were dismantled, and equipment removed. In 1964, Federal Resources Corporation constructed a 250 tons per day flotation mill to reprocess at the Site. Tailings reprocessing took place in 1964 and 1965. The Moore Mine Site presently consists of the 6-acre tailings pile, as well remains of the former mill and shop, and a still intact bunkhouse. The tailings pile is located just south of the site entrance from Broadford F lies on relatively level ground and rises about 20 feet above the origin ground surface. The tailings pile is bordered on the east by Broadford

Slough, which runs within five feet of the toe of the tailings pile in some places. Lead concentrations in an e 6-acre tailings pile at the Site range from 1,400 to 18,500 parts-per-million (ppm). Elevated concentrations c exist in nearby soils, including lead concentrations of 4,300 ppm at the former mill building area. The remov includes the construction of a permanent clean cover for the tailings pile at the Minnie Moore Mine. Other ne soils containing lead concentrations of 700 ppm or more will be removed and excavated areas will be backfil clean fill.

Current Activities

9/26/05: EPA OSC, ERRS and START contractors mobilized to site. Personnel on site: 1 EPA; 1 START contractor; 7 ERRS contractor. Equipment on site: 1 excavator 330; 1 front loader 938; 1 dozer D6; 1 haul t ton; 1 water truck. ERRS installed silt fence and began cutting side slope on east side of tailings pile (facing Broadford Slough) to 3:1. START contractor collected soils samples at nearby day care facility and on site a former mill and bunkhouse area.

9/27/05: Personnel and equipment on site same as 9/26/05. ERRS continued cutting and grading side slope east side to north end of pile. START finished collecting soil samples (28 total) and ran samples using XRF analyzer. Five samples were selected to be sent for confirmatory laboratory analysis. START demobilized f

9/28/05: Personnel on site: 1 EPA, 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 1 haul truck 40-ton; 1 water truck. Additional excavator and dozer delivered to site to speed work. began cutting side slope to 3:1 on northwest and northeast corners of tailings pile. Removed trees where ne to achieve proper slope. ERRS began removing contaminated soils around former mill area for consolidation tailings pile. EPA OSC interviewed with reporter and photographer from the Idaho Mountain Express local b newspaper.

Planned Removal Actions

Continue shaping tailings pile to 3:1 side slopes and 10:1 crown. Continue excavating contaminated soils in mill area and incorporate on tailings pile. Backfill excavated areas with clean soil. Place 2 foot clean soil co tailings pile. Revegetate tailings pile.

| [web sites](#) | [regional web sites](#) | [profile](#) | [bulletins](#) | [images](#) | [documents](#) | [POLREPs](#) | [contacts](#) | [links](#) |

**United States Environmental Protection Agency
Region X
POLLUTION REPORT**

Date: Thursday, October 06, 2005

From: Greg Weigel, OSC

To: Chris Field, EPA R10
Jim Wertz, EPA R10
Bill Allred, Idaho DEQ

Dan Opalski, EPA R10
Eugene Lee, EPA HQ

Subject: Minnie Moore Mine
Broadford Road, 1.5 miles west of Bellevue, Bellevue, ID
Latitude: 43.4682
Longitude: -114.2834

POLREP No.:	2	Site #:	10CP
Reporting Period:	9/29/05 - 10/5/05	D.O. #:	0038
Start Date:	9/26/2005	Response Authority:	CERCLA
Mob Date:	9/26/2005	Response Type:	Time-Critical
Completion Date:		NPL Status:	Non NPL
CERCLIS ID #:		Incident Category:	Removal Action
RCRIS ID #:		Contract #	

Site Description

The Minnie Moore Mine Site presently consists of the 6-acre tailings pile, as well as the remains of the former mill and shop, and a still intact bunkhouse. The main tailings pile is located just south of the site entrance from Broadford Road. It lies on relatively level ground and rises about 20 feet above the original ground surface. The tailings pile is bordered on the east by Broadford Slough, which runs within five feet of the toe of the tailings pile in some places. Lead concentrations in an exposed 6-acre tailings pile at the Site range from 1,400 to 18,500 parts-per-million (ppm). Elevated concentrations of metals exist in nearby soils, including lead concentrations of 4,300 ppm at the former mill building area. The removal action includes the construction of a permanent clean cover for the tailings pile at the Minnie Moore Mine. Other nearby soils containing lead concentrations of 700 ppm or more will be removed and excavated areas will be backfilled with clean fill. EPA and contractor personnel mobilized to the site for cleanup on 9/26/05.

Current Activities

9/29/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 2 dozer D6; 1 haul truck 40-ton; 1 water truck. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile.

9/30/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 2 dozer D6; 1 haul truck 40-ton; 1 water truck. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile. EPA OSC left site to spend weekend at home. ERRS to continue working 10-hour day on Saturday and take Sunday off.

10/3/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 2 dozer D6; 1 haul truck 40-ton; 1 water truck. EPA OSC re-mobilized to

site. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile.

10/4/05: Personnel on site: 2 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 2 dozer D6; 1 haul truck 40-ton; 1 water truck. EPA RPM Matt Wilkening arrived on site to review site work. Wilkening will be OSC representative week of 10/10/05, as Weigel has response duty that week. Three Idaho DEQ personnel from Twin Falls office visited site to review site conditions and cleanup progress. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile. EPA, ERRS contractor and site property owner examined alternate source of topsoil on site for use as final cover and growing medium for re-vegetation. Determined that we will use this better quality (less rocky) source of topsoil for final 1-foot cover. Using this source will require a longer haul and an additional haul truck than previously anticipated. Already stockpiled soil with high clay content will be used for first 1-foot lift of cap.

10/5/05: Personnel on site: 2 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 2 dozer D6; 1 haul truck 40-ton; 1 water truck. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile. EPA met with Blaine County roads and bridges supervisor to discuss requirements along Broadford Road, where toe of tailings pile comes down to road. With reduced side slopes of tailings pile there is concern that traffic, particularly motorcycles and 4-wheel drive vehicles, will ride up onto the tailings pile at the sharp corner of Broadford Road adjacent to the re-configured tailings pile. Agreed that the County will install a warning sign at the corner, and EPA will install barb-wire fence at toe of tailings pile adjacent to road. Wilkening de-mobilized from site.

Planned Removal Actions

Continue shaping tailings pile to 3:1 side slopes and 10:1 crown. Continue excavating contaminated soils in former mill area and incorporate on tailings pile. Backfill excavated areas with clean soil. Place 2 foot clean soil cover on tailings pile. Revegetate tailings pile. Projected completion date 10/21/05.

Estimated Costs *

	Budgeted	Total To Date	Remaining	% Remaining
Extramural Costs				
ERRS - Cleanup Contractor	\$330,000.00	\$186,000.00	\$144,000.00	43.64%
RST/START	\$50,000.00	\$20,000.00	\$30,000.00	60.00%
Intramural Costs				
USEPA - Direct (Region, HQ)	\$5,000.00	\$2,000.00	\$3,000.00	60.00%
USEPA - InDirect	\$5,000.00	\$2,000.00	\$3,000.00	60.00%
Total Site Costs	\$390,000.00	\$210,000.00	\$180,000.00	46.15%

* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not

be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

[epaosc.net/MinnieMooreMine](http://epaossc.net/MinnieMooreMine)

**United States Environmental Protection Agency
Region X
POLLUTION REPORT**

Date: Wednesday, October 19, 2005

From: Greg Weigel, OSC

To: Chris Field, EPA R10
Jim Wertz, EPA R10
Bill Allred, Idaho DEQ

Dan Opalski, EPA R10
Eugene Lee, EPA HQ

Subject: Minnie Moore Mine
Broadford Road, 1.5 miles west of Bellevue, Bellevue, ID
Latitude: 43.4682
Longitude: -114.2834

POLREP No.:	3	Site #:	10CP
Reporting Period:	Oct. 6-18, 2005	D.O. #:	0038
Start Date:	9/26/2005	Response Authority:	CERCLA
Mob Date:	9/26/2005	Response Type:	Time-Critical
Completion Date:		NPL Status:	Non NPL
CERCLIS ID #:	IDN001002295	Incident Category:	Removal Action
RCRIS ID #:		Contract #	

Site Description

The Minnie Moore Mine Site presently consists of the 6-acre tailings pile, as well as the remains of the former mill and shop, and a still intact bunkhouse. The main tailings pile is located just south of the site entrance from Broadford Road. It lies on relatively level ground and rises about 20 feet above the original ground surface. The tailings pile is bordered on the east by Broadford Slough, which runs within five feet of the toe of the tailings pile in some places. Lead concentrations in an exposed 6-acre tailings pile at the Site range from 1,400 to 18,500 parts-per-million (ppm). Elevated concentrations of metals exist in nearby soils, including lead concentrations of 4,300 ppm at the former mill building area. The removal action includes the construction of a permanent clean cover for the tailings pile at the Minnie Moore Mine. Other nearby soils containing lead concentrations of 700 ppm or more will be removed and excavated areas will be backfilled with clean fill. EPA and contractor personnel mobilized to the site for cleanup on 9/26/05.

Current Activities

10/6/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 2 dozer D6; 1 haul truck 40-ton; 1 water truck. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile. ERRS began excavation around former mill buildings. Brought in mini-excavator for the day to help w/ excavation around buildings. OSC Weigel returned to Boise.

10/7/05: Personnel on site: 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 2 dozer D6; 1 haul truck 40-ton; 1 water truck; 1 mini-excavator. ERRS completed pulling back side slopes of tailings pile to 3:1 and shaping top of pile. ERRS completed excavation around former mill buildings. Mini-excavator demob.

10/10/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 1 dozer D6; 2 haul truck 40-ton; 1 water truck. RPM Matt Wilkening mobilized to site as OSC representative for Weigel. ERRS began placing cover material on tailing pile. Working from staged piles of cover material around the pile. One dozer decon'ed and waiting to be picked up. The second haul truck arrived on Sunday.

10/11/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 1 dozer D6; 2 haul truck 40-ton; 1 water truck. ERRS continued placing cover material on tailing pile. First 1-foot lift is high clay content material previously stockpiled on site by property owner. First 1-foot lift compacted using loaded haul trucks. All stockpiled cover material has been used. Began hauling cover material from barrow site on the hillside for final 1-foot lift of topsoil.

10/12/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 1 dozer D6; 2 haul truck 40-ton; 1 water truck. ERRS continued placing cover material on tailing pile. Jute netting arrive in AM.

10/13/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 1 dozer D6; 2 haul truck 40-ton; 1 water truck. ERRS continued placing cover material on tailing pile. Dozer that had been deconned on 10/8 removed from site today. One ERRS employee demob'ed from site.

10/14/05: Personnel on site: 1 EPA; 7 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 1 dozer D6; 2 haul truck 40-ton; 1 water truck. ERRS continued placing and compacting cover material on tailing pile. OSC Rep. Wilkening demob'ed for Boise.

10/15/05: Personnel on site: 7 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 1 dozer D6; 2 haul truck 40-ton; 1 water truck. ERRS completed placement of cover on tailings pile. Reclaimed topsoil barrow area. Decon'ed equipment. 2 ERRS personnel demob'd from site.

10/17/05: Personnel on site: 1 EPA; 5 ERRS contractor. All equipment off rent except 1 excavator and 1 haul truck. OSC Weigel re-mob'ed to site. Revegetation subcontractor arrived and broadcast fertilizer over tailings pile cap and applied specified seed mix (native grasses and forbs) using a no-till drill seeder. Seed was spread by hand along toes of slopes. ERRS began laying out and anchoring jute erosion control matting over seeded side slopes. Re-vegetation subcontractor completed work.

10/18/05: Personnel on site: 1 EPA; 5 ERRS contractor. All equipment off rent except 1 excavator (used for loading jute netting). ERRS completed placement and anchoring of jute netting on seeded 3:1 side slopes. All ERRS personnel except 1 demob'ed from site. OSC demob'ed.

Next Steps

Revegetation subcontractor to return on 10/19 to apply straw mulch over seeded tailings pile. Survey subcontractor to conduct topographical site survey of tailings pile on 10/19, for as-built drawings of completed work. Fencing subcontractor to install approximately 270 feet of three-strand barbwire fence at toe of tailings pile along Broadford Road, to keep snowmobilers and 4-wheelers from riding up onto the tailings pile from Broadford Road.

Key Issues

Need to have discussion with Idaho DEQ and Blaine County regarding appropriate institutional controls to ensure the integrity of completed cleanup work into the future.

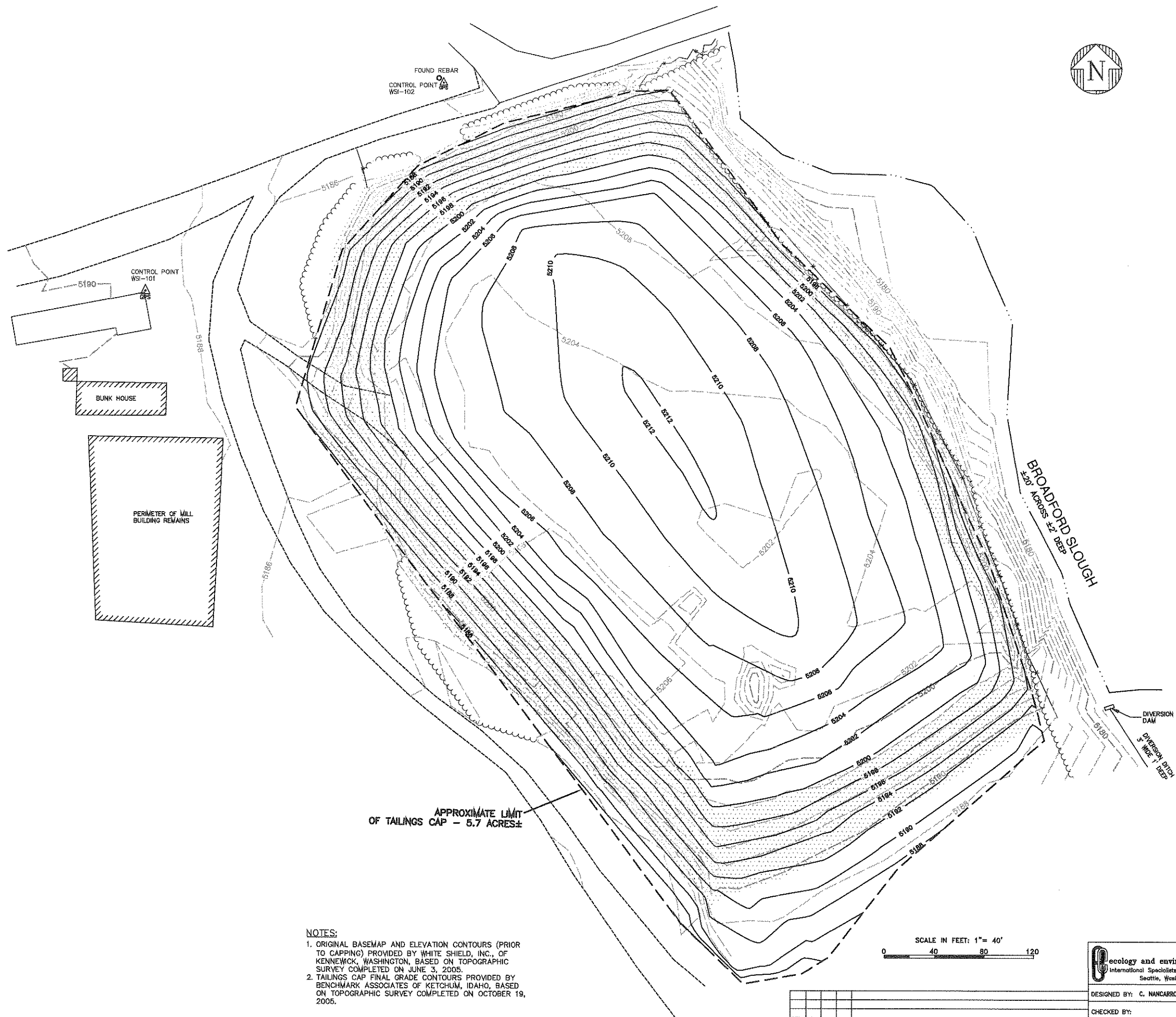
Estimated Costs *

	Budgeted	Total To Date	Remaining	% Remaining
Extramural Costs				
ERRS - Cleanup Contractor	\$330,000.00	\$287,800.00	\$42,200.00	12.79%
RST/START	\$50,000.00	\$37,000.00	\$13,000.00	26.00%
Intramural Costs				
USEPA - Direct (Region, HQ)	\$5,000.00	\$3,500.00	\$1,500.00	30.00%
USEPA - InDirect	\$5,000.00	\$3,500.00	\$1,500.00	30.00%
Total Site Costs	\$390,000.00	\$331,800.00	\$58,200.00	14.92%

* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

epaosc.net/MinnieMooreMine

APPENDIX D
RECORD DRAWING



NOTES:

1. ORIGINAL BASEMAP AND ELEVATION CONTOURS (PRIOR TO CAPPING) PROVIDED BY WHITE SHIELD, INC., OF KENNEWICK, WASHINGTON, BASED ON TOPOGRAPHIC SURVEY COMPLETED ON JUNE 3, 2005.
2. TAILINGS CAP FINAL GRADE CONTOURS PROVIDED BY BENCHMARK ASSOCIATES OF KETCHUM, IDAHO, BASED ON TOPOGRAPHIC SURVEY COMPLETED ON OCTOBER 19, 2005.

LEGEND

- FOUND MONUMENT AS NOTED
- △ SET CONTROL POINT 5/8"x24" REBAR WITH 1-1/4" PLASTIC CAP "WSI CONTROL", ESTABLISHED BY STATIC OR RTK GPS METHODS
- EDGE GRAVEL ROAD
- EDGE ASPHALT ROAD
- APPROXIMATE CENTERLINE OF CREEK
- VEGETATION LINE
- FENCE LINE
- APPROXIMATE LIMIT OF TAILINGS CAP
- 5200 --- ELEVATION CONTOURS PRIOR TO CAPPING (FT. NAVD)
- 5206 --- ELEVATION CONTOURS AFTER CAPPING (FT. NAVD)

SCALE IN FEET: 1" = 40'

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

DESIGNED BY: C. NANCARROW

CHECKED BY:

DRAWN BY: S. STEVENS

APPROVED BY: A. WHITMAN

FINAL GRADE - TAILINGS CAP
RECORD DRAWING

MINNIE MOORE MINE SITE
BELLEVUE, IDAHO

SCALE	DATE ISSUED	CLASH FILE NO.	PROJECT NO.
NOTED	12-01-05	MinnieMoore As-Built.dwg	

APPENDIX E
TOPSOIL TESTING RESULTS

A & L WESTERN AGRICULTURAL LABORATORIES

REPORT NUMBER
05-118-098

PORTLAND OFFICE • 503-968-9225
10220 S.W. Nimbus Ave., Bldg. K-9 • Portland, OR 97223
Client No: 99999

SEND TO: ECOLOGY AND ENVIRONMENT, INC.
2101 FOURTH AVE STE 1900
SEATTLE, WA 98121-

GROWER: 1281048001SF

SUBMITTED

BY: CHAD HINDRICKS

GRAPHICAL SOIL ANALYSIS REPORT

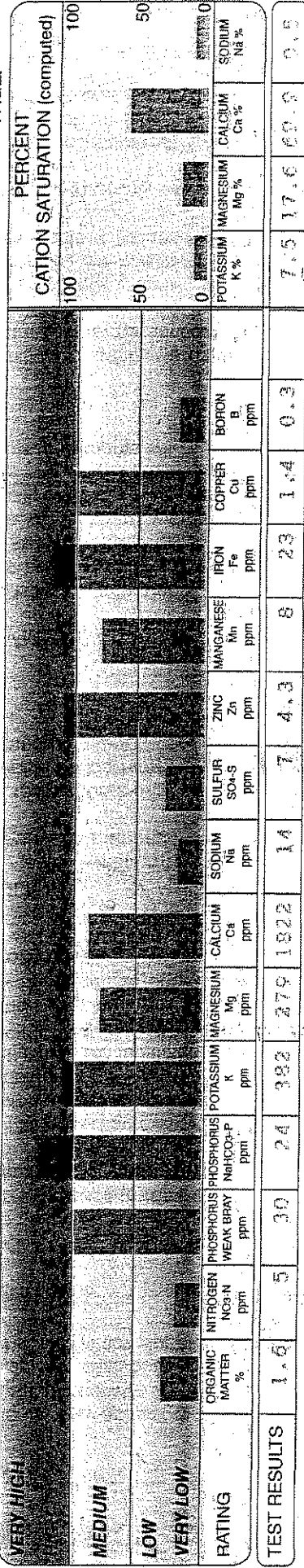
DATE OF REPORT: 05/03/2005

LAB NO: 58443

SAMPLE ID:

MMRCS

PAGE:



SOIL FERTILITY GUIDELINES

CROP: NATIVE DESERT

RATE: lb/acre

BUFFER pH: 7.0

INCREASING SALINITY

LOW AVERAGE HIGH



DOLOMITE (100 score)	LIME (100 score)	GYP SUM	ELEMENTAL SULFUR	NITROGEN N	PHOSPHATE P2O5	POTASH K2O	MAGNESIUM Mg	SULFUR SO4-S	ZINC Zn	MANGANESE Mn	IRON Fe	COPPER Cu	BORON B	REFER TO BACK
				70	20			15					1.0	ALL

REVEGETATION should preferably be conducted on soils with a pH above 6.5 but below 7.5 and more than 2% organic matter. A minimum of 30 lb N/acre (15 ppm NO3-N) should be available at planting. IDEALLY, fertilize just before the first germinating rain if irrigation is not available. For maximum economic return, one should probably not fertilize more than once every two years. BORON: Aim for soil levels above 0.5 ppm to avoid a deficiency. A tissue analysis at the appropriate time will determine more accurately, plant availability. ADD BORON WITH CAUTION.

12/17/05
DARCY PEREIRA, CCN

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A & L WESTERN AGRICULTURAL LABORATORIES

10220 S.W. Nimbus Ave., Bldg K-9 • Portland, OR 97223 • Ph: (503) 968-9225



05-118-000
REPORT NUMBER

Client No: 99999

ECOLOGICAL AND ENVIRONMENTAL, INC.
2101 FOURTH AVE STE 1900
SEATTLE, WA 98121

Grower: 12810432001SF

Submitted by: CHAD HANCAPIROW

Date: 05/03/2005

Page 1

Soil Physical Characteristics

Sample Lab Number	% Sand	% Silt	% Clay	Soil Texture	Moisture @ 1/3 Bar	Moisture @ 15 Bar	Available Water %
MMW05 59443	35	36	29	CLAY LOAM			

A & L WESTERN AGRICULTURAL LABORATORIES, INC.

Nancy J. Pender

DARCY PENDER, CCA

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APPENDIX F
MINNIE MOORE MINE REMOVAL ACTION WEBSITE CONTENT

[All POLREPs for this site](#)

Minnie Moore Mine
Bellevue, ID - EPA Region X
POLREP #1 - Initiation of Action

[Printer Friendly](#)

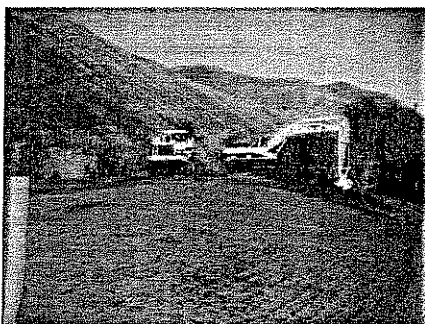
On-Scene Coordinator - Greg Weigel

9/

Time-Critical - Removal Action

Pollution Report (POLREP)

Start Date: 9/26/2005



Site Description

The Minnie Moore Mine produced about \$7 million worth of silver ore in 1881 and 1887. In 1927, the mine was abandoned, buildings were dismantled, and equipment removed. In 1964, Federal Resources Corporation constructed a 250 tons per day flotation mill to reprocess ore at the Site. Tailings reprocessing took place in 1964 and 1965. The Minnie Moore Mine Site presently consists of the 6-acre tailings pile, as well as remains of the former mill and shop, and a still intact bunkhouse. The tailings pile is located just south of the site entrance from Broadford Road. It lies on relatively level ground and rises about 20 feet above the original ground surface. The tailings pile is bordered on the east by Broadford

Slough, which runs within five feet of the toe of the tailings pile in some places. Lead concentrations in an area of the 6-acre tailings pile at the Site range from 1,400 to 18,500 parts-per-million (ppm). Elevated concentrations of lead exist in nearby soils, including lead concentrations of 4,300 ppm at the former mill building area. The removal action plan includes the construction of a permanent clean cover for the tailings pile at the Minnie Moore Mine. Other nearby soils containing lead concentrations of 700 ppm or more will be removed and excavated areas will be backfilled with clean fill.

Current Activities

9/26/05: EPA OSC, ERRS and START contractors mobilized to site. Personnel on site: 1 EPA; 1 START contractor; 7 ERRS contractor. Equipment on site: 1 excavator 330; 1 front loader 938; 1 dozer D6; 1 haul truck; 1 water truck. ERRS installed silt fence and began cutting side slope on east side of tailings pile (facing Broadford Slough) to 3:1. START contractor collected soils samples at nearby day care facility and on site at the former mill and bunkhouse area.

9/27/05: Personnel and equipment on site same as 9/26/05. ERRS continued cutting and grading side slope on east side to north end of pile. START finished collecting soil samples (28 total) and ran samples using XRF analyzer. Five samples were selected to be sent for confirmatory laboratory analysis. START demobilized.

9/28/05: Personnel on site: 1 EPA, 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 1 dozer D6; 1 haul truck 40-ton; 1 water truck. Additional excavator and dozer delivered to site to speed work. began cutting side slope to 3:1 on northwest and northeast corners of tailings pile. Removed trees where needed to achieve proper slope. ERRS began removing contaminated soils around former mill area for consolidation on tailings pile. EPA OSC interviewed with reporter and photographer from the Idaho Mountain Express local newspaper.

Planned Removal Actions

Continue shaping tailings pile to 3:1 side slopes and 10:1 crown. Continue excavating contaminated soils in mill area and incorporate on tailings pile. Backfill excavated areas with clean soil. Place 2 foot clean soil cover on tailings pile. Revegetate tailings pile.

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Minnie Moore Mine

Bellevue, ID - EPA Region X
POLREP #2

[Printer Friendly](#)

On-Scene Coordinator - Greg Weigel

Time-Critical - Removal Action

Start Date: 9/26/2005

Pollution Report (POLREP)

11



Site Description

The Minnie Moore Mine Site presently consists of the 6-acre tailings pile, well as the remains of the former mill and shop, and a still intact bunkhouse. The main tailings pile is located just south of the site entrance from Broadford Road. It lies on relatively level ground and rises about 10 feet above the original ground surface. The tailings pile is bordered on the east by Broadford Slough, which runs within five feet of the toe of the tailings pile in some places. Lead concentrations in an exposed 6-acre tailings pile range from 1,400 to 18,500 parts-per-million (ppm). Elevated concentrations of metals exist in nearby soils, including lead concentrations of 4,300 ppm at the former mill building area. The removal action includes

construction of a permanent clean cover for the tailings pile at the Minnie Moore Mine. Other nearby soils with lead concentrations of 700 ppm or more will be removed and excavated areas will be backfilled with clean fill and contractor personnel mobilized to the site for cleanup on 9/26/05.

Current Activities

9/29/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 1 haul truck 40-ton; 1 water truck. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile.

9/30/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 1 haul truck 40-ton; 1 water truck. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile. EPA OSC left site to spend weekend at home. ERRS to continue working 10-hour day on Saturday and take Sunday off.

10/3/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 1 haul truck 40-ton; 1 water truck. EPA OSC re-mobilized to site. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile.

10/4/05: Personnel on site: 2 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 1 haul truck 40-ton; 1 water truck. EPA RPM Matt Wilkening arrived on site to review site work. V will be OSC representative week of 10/10/05, as Weigel has response duty that week. Three Idaho DEQ personnel from Twin Falls office visited site to review site conditions and cleanup progress. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile. EPA, ERRS contractor and site property owner examine alternate source of topsoil on site for use as final cover and growing medium for re-vegetation. Determined it will use this better quality (less rocky) source of topsoil for final 1-foot cover. Using this source will require a haul and an additional haul truck than previously anticipated. Already stockpiled soil with high clay content was used for first 1-foot lift of cap.

10/5/05: Personnel on site: 2 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 1 haul truck 40-ton; 1 water truck. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile. EPA met with Blaine County roads and bridges supervisor to discuss requirements along Broadford Road, where toe of tailings pile comes down to road. With reduced side slopes of tailings pile the

concern that traffic, particularly motorcycles and 4-wheel drive vehicles, will ride up onto the tailings pile at the corner of Broadford Road adjacent to the re-configured tailings pile. Agreed that the County will install a war sign at the corner, and EPA will install barb-wire fence at toe of tailings pile adjacent to road. Wilkening de-n from site.

Planned Removal Actions

Continue shaping tailings pile to 3:1 side slopes and 10:1 crown. Continue excavating contaminated soils in mill area and incorporate on tailings pile. Backfill excavated areas with clean soil. Place 2 foot clean soil cover on tailings pile. Revegetate tailings pile. Projected completion date 10/21/05.

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Minnie Moore Mine

Bellevue, ID - EPA Region X
POLREP #3

[Printer Friendly](#)**On-Scene Coordinator - Greg Weigel**

10/

Time-Critical - Removal Action**Pollution Report (POLREP)****Start Date: 9/26/2005**

Site Description

The Minnie Moore Mine Site presently consists of the 6-acre tailings pile as well as the remains of the former mill and shop, and a still intact bunkhouse. The main tailings pile is located just south of the site entrance from Broadford Road. It lies on relatively level ground and rises about 10 feet above the original ground surface. The tailings pile is bordered on the east by Broadford Slough, which runs within five feet of the toe of the tailings pile in some places. Lead concentrations in an exposed 6-acre tailings pile site range from 1,400 to 18,500 parts-per-million (ppm). Elevated concentrations of metals exist in nearby soils, including lead concentrations of 4,300 ppm at the former mill building area. The removal action includes

construction of a permanent clean cover for the tailings pile at the Minnie Moore Mine. Other nearby soils with lead concentrations of 700 ppm or more will be removed and excavated areas will be backfilled with clean fill and contractor personnel mobilized to the site for cleanup on 9/26/05.

Current Activities

10/6/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 1 haul truck 40-ton; 1 water truck. ERRS continued pulling back side slopes of tailings pile to 3:1 and shaping top of pile. ERRS began excavation around former mill buildings. Brought in mini-excavator for the help w/ excavation around buildings. OSC Weigel returned to Boise.

10/7/05: Personnel on site: 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 2 dozer D6; 1 haul truck 40-ton; 1 water truck; 1 mini-excavator. ERRS completed pulling back side slopes of tailings pile to 3:1 and shaping top of pile. ERRS completed excavation around former mill buildings. Mini-excavator demobilized.

10/10/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 2 haul truck 40-ton; 1 water truck. RPM Matt Wilkening mobilized to site as OSC representative for EPA. ERRS began placing cover material on tailing pile. Working from staged piles of cover material around tailing pile. One dozer disconnected and waiting to be picked up. The second haul truck arrived on Sunday.

10/11/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 2 haul truck 40-ton; 1 water truck. ERRS continued placing cover material on tailing pile. First 1-foot high clay content material previously stockpiled on site by property owner. First 1-foot lift compacted using 10-ton haul trucks. All stockpiled cover material has been used. Began hauling cover material from borrow site on hillside for final 1-foot lift of topsoil.

10/12/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 2 haul truck 40-ton; 1 water truck. ERRS continued placing cover material on tailing pile. Jute netting arrived in AM.

10/13/05: Personnel on site: 1 EPA; 8 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader dozer D6; 2 haul truck 40-ton; 1 water truck. ERRS continued placing cover material on tailing pile. Dozer that had been disconnected on 10/8 removed from site today. One ERRS employee demobilized from site.

10/14/05: Personnel on site: 1 EPA; 7 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader D6; 2 haul truck 40-ton; 1 water truck. ERRS continued placing and compacting cover material on tail pile. OSC Rep. Wilkening demob'ed for Boise.

10/15/05: Personnel on site: 7 ERRS contractor. Equipment on site: 2 excavator 330; 1 front loader 938; 1 D6; 2 haul truck 40-ton; 1 water truck. ERRS completed placement of cover on tailings pile. Reclaimed topsoil barrow area. Decon'ed equipment. 2 ERRS personnel demob'd from site.

10/17/05: Personnel on site: 1 EPA; 5 ERRS contractor. All equipment off rent except 1 excavator and 1 haul truck. OSC Weigel re-mob'ed to site. Revegetation subcontractor arrived and broadcast fertilizer over tailing cap and applied specified seed mix (native grasses and forbs) using a no-till drill seeder. Seed was spread along toes of slopes. ERRS began laying out and anchoring jute erosion control matting over seeded side slopes. Re-vegetation subcontractor completed work.

10/18/05: Personnel on site: 1 EPA; 5 ERRS contractor. All equipment off rent except 1 excavator (used for jute netting). ERRS completed placement and anchoring of jute netting on seeded 3:1 side slopes. All ERRS personnel except 1 demob'ed from site. OSC demob'ed.

Next Steps

Revegetation subcontractor to return on 10/19 to apply straw mulch over seeded tailings pile. Survey subcontractor to conduct topographical site survey of tailings pile on 10/19, for as-built drawings of completed work. Fence subcontractor to install approximately 270 feet of three-strand barbed wire fence at toe of tailings pile along Bradford Road, to keep snowmobilers and 4-wheelers from riding up onto the tailings pile from Bradford Road.

Key Issues

Need to have discussion with Idaho DEQ and Blaine County regarding appropriate institutional controls to ensure integrity of completed cleanup work into the future.

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Minnie Moore Mine

Bellevue, ID - EPA Region X



Site Contact:
Greg Weigel
 OSC
weigel.greg@epa.gov

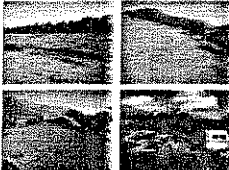
www.epaosc.org/MinnieMooreMine
 Broadford Road, 1.5 miles west of Be
 Bellevue, ID

Latitude: 43.4682
 Longitude: -114.2834

[site map](#) | [area map](#) | [bookmark](#)

The Minnie Moore Mine produced about \$7 million worth of silver ore between 1881 and 1887. In 1927, the was abandoned, buildings were dismantled, and equipment removed. In 1964, Federal Resources Corpora constructed a 250 tons per day flotation mill to reprocess tailings at the Site. Tailings reprocessing took plac 1964 and 1965. The Minnie Moore Mine Site presently consists of the 6-acre tailings pile, as well as the ren the former mill and shop, and a still intact bunkhouse. The main tailings pile is located just south of the site entrance from Broadford Road. It lies on relatively level ground and rises about 20 feet above the original gi surface. The tailings pile is bordered on the east by Broadford Slough, which runs within five feet of the toe tailings pile in some places. Lead concentrations in an exposed 6-acre tailings pile at the Site range from 1, 18,500 parts-per-million (ppm). Elevated concentrations of metals exist in nearby soils, including lead concentrations of 4,300 ppm at the former mill building area. The removal action includes the construction c permanent clean cover for the tailings pile at the Minnie Moore Mine. Other nearby soils containing lead concentrations of 700 ppm or more will be removed and excavated areas will be backfilled with clean fill.

For additional information, visit the **Pollution Report (POLREPs)** section.

Images	Documents	Contacts	Links
 List All...	Minnie Moore Mine Action Mem... List All...	ERU Unit Manager: field.chris@epa.gov ECL Director: opalski.dan@epa.gov Acting ERU Manager: sheldrake.beth@epa.gov List All...	None for this site.

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