# IDAHO MINING ASSOCIATION
## SELENIUM COMMITTEE

# Final – Spring 2001 Area-Wide Investigation Data Transmittal

Southeast Idaho Phosphate Resource Area
Selenium Project

March 2002

Prepared by

MWH
MONTGOMERY WATSON HARZA

2375 130th Avenue N.E., Suite 200
Bellevue, Washington 98005

# TABLE OF CONTENTS



LIST OF TABLES



LIST OF FIGURES

LIST OF APPENDICES

# 1.0 INTRODUCTION

This report contains surface water and soil data collected in May 2001 by the Idaho Mining Association (IMA) Selenium Committee as part of the Spring 2001 Area-Wide Investigation.

## 1.1 REPORT ORGANIZATION

The contents of this report are as follows:

- Section 1.0. Introduction – This section describes the purpose of the report, identifies the scope and objectives of the Spring 2001 Area-Wide Investigation, and presents a brief background discussion of the Selenium Project.

- Section 2.0. Field and Laboratory Methodologies – This section describes procedures and methodologies used for data collection, laboratory analyses, and data evaluation.

- Section 3.0. Data Results – This section presents sampling and analyses results for data collected in May 2001.

- Section 4.0. Data Analyses – Data analyses of water and soil are discussed in the section. The results of screening and statistical calculation are presented.

- Section 5.0. References – This section lists the references cited.

Supporting documentation is included in the appendices.

## 1.2 SPRING 2001 AREA-WIDE INVESTIGATION OBJECTIVES AND SCOPE

Pursuant to the Interagency MOU, the IDEQ developed a scope of work for the Area Wide Investigation which was incorporated as part of an Administrative Order on Consent (AOC). The AOC was negotiated between federal, tribal, and state agencies and the IMA Selenium Committee companies. For the Spring 2001 Area-Wide Investigation, Montgomery Watson Harza (MWH), on behalf of the IMA Selenium Committee, implemented a scope of work and sampling design developed by IDEQ to fill data gaps. These data gaps are presented in the Draft Data Gap Technical Memorandum (TetraTech EM Inc.[TtEMI], 2001a). For this sampling event, Montgomery Watson Harza was tasked with sampling surface water and waste rock dump soil.

### 1.2.1 Surface Water

The following objectives for surface water sampling were taken directly from "Technical Note: Seep, Pond, Pit Lake, and French Drain Characterization" (TtEMI, 2001b). The entire document can be found in Appendix A.

> The seep, pond, pit lake, and French drain characterization will supplement existing data and provide verification of the range of concentrations for selected constituents within

these surface water features. The proposed characterization program emphasizes (1) the inventory of all surface water features in the study area, (2) sampling of all identified surface water features for field water quality analyses, (3) sampling of all ponds and pit lakes identified in the study area for laboratory analyses, (4) resampling of all seeps, ponds, French drains previously sampled in 1998 for evaluation of temporal variations in water quality at these locations, and (5) sampling of the two seeps with the highest observed flows at each mine site. These features represent potential sources of chemical constituents are accessible to uptake by plants and/or animals. The seep sample sites that will be selected for laboratory analyses are broadly dispersed over a large area and are expected to vary temporally in response seasonal and annual climate fluctuations. Thus, the seep water quality assessment effort is not intended to provide a definitive description of the seep water at a particular mine, but rather a representation of the seep water as an area wide source.

The analytical data from this sampling effort will be used primarily to support the establishment of constituents of potential concern (COPC) for human health and ecological risk assessment and development of bounding conditions for the source term of these surface water features.

### 1.2.2 Soil

The following objectives for waste rock dump soil sampling were taken directly from "Technical Note: Waste Rock Characterization" (TtEMI, 2001c). The entire document can be found in Appendix A.

The waste rock characterization will supplement existing data and provide verification of the range of concentrations for selected constituents. The proposed sampling emphasizes materials that occur at the surface of the waste dumps and are accessible for uptake by plants and animals. The sample sites are broadly dispersed over a large area that contains millions of tons of waste rock. Thus, this effort is not intended to provide a definitive description of the waste rock dumps at a particular mine, but rather a representation of the waste rock as an area wide source.

The analytical data from this sampling effort will be used primarily to support the establishment of constituents of potential concern (COPC) for human health and ecological risk assessment and development of bounding conditions for the waste rock source term.

## 1.3 PROJECT BACKGROUND

Phosphate mining has been an ongoing activity within the Southeast Idaho Resource Area (Resource Area) since Conda Mine started operations in 1919. Today four companies operate phosphate mines in the region, and the ore derived from these mines is locally processed into fertilizer and elemental phosphorous, two important products in the world economy. Phosphate mining and ore processing form an important economic foundation for Southeast Idaho.

In late 1996, six horses pastured downstream of a closed, reclaimed phosphate mine were diagnosed with alkalai disease, a form of chronic selenosis. This event prompted concern by

mine operators, the public, local, state and federal agencies about potential selenium impacts to the environment. To address these concerns, the IMA formed the IMA Selenium Committee in early spring 1997 to identify the source and extent of selenium and other trace element impacts associated with phosphate mining activities. In addition to identifying the environmental impacts, the IMA Selenium Committee is developing mitigation measures to address selenium and other target element releases and to minimize the potential threat to the environment.

The IMA Selenium Committee consists of five companies currently mining or who have recently mined phosphate ore in Southeast Idaho: FMC Corporation (FMC); J.R. Simplot Company (Simplot); Monsanto Company (Monsanto); Nu-West Industries, Inc. (Nu-West); and, Rhodia, Inc. (Rhodia).

A sixth company, Astaris Production LLC (Astaris), which is a joint venture between FMC and Solutia, Inc., is the current operator of one of the four active mines. However, at this time they are not a participating member of the IMA Selenium Committee. These companies and their respective active and inactive mines are identified in Table 1.1, *Phosphate Mines in the Southeast Idaho Phosphate Resource Area.* The locations of these mines are shown on Figure 1-1.

**TABLE 1-1**
**PHOSPHATE MINES IN THE SOUTHEAST IDAHO PHOSPHATE RESOURCE AREA**

| Company | Mines | |
|---|---|---|
| | **Active** | **Inactive** |
| Astaris | Dry Valley Mine | None |
| FMC | None | Gay Mine[1] |
| Simplot | Smoky Canyon Mine | Lanes Creek Mine[2]<br>Conda Mine<br>Gay Mine[1] |
| Monsanto | Enoch Valley Mine | Henry Mine<br>Ballard Mine |
| Nu-West | Rasmussen Ridge Mine | Mountain Fuel Mine<br>Champ Mine<br>North Maybe Canyon Mine<br>South Maybe Canyon Mine[3]<br>Georgetown Canyon Mine |
| Rhodia | None | Wooley Valley Mine |

**Notes:** [1]Responsibility for Gay Mine is shared between FMC and Simplot.
[2]Simplot obtained Lanes Creek in 1997 as part of the Alumet Reserves. Alumet retains any and all environmental liabilities associated for the mine prior to the purchase.
[3]South Maybe Canyon Mine is not included in the scope of the Selenium Project. It is being addressed separately under a consent order between Nu-West and United States Forest Service.

The Selenium Project was instituted as a voluntary program to address the mining related environmental issues. The Selenium Working Group (SeWG) was established to facilitate communication with and participation by state, local, and federal agencies, the Shoshone-Bannock Tribes, the public, and the IMA Selenium Committee companies. In July 2000, federal, tribal, and state agencies signed an *Interagency Memorandum of Understanding concerning Contamination from Phosphate Mining Operations in Southeast Idaho* (Interagency MOU). The

Interagency MOU specified the Idaho Department of Environmental Quality (IDEQ) as the lead agency for coordinating the Area-Wide Investigation and for establishing regional clean-up guidance to assist lead agencies in implementing future site-specific remedial efforts in the Southeast Idaho Phosphate Mining Resource Area. The IDEQ Selenium Area-Wide Advisory Committee (SeAWAC) was formed to provide a forum for continued dialogue, report review, and technical discussions. The SeAWAC includes the same agencies and IMA company representatives as the SeWG which includes:

- Idaho Department of Environmental Quality (IDEQ)
- Idaho Department of Lands (IDL)
- Idaho Department of Fish and Game (IDFG)
- Idaho Department of Health and Welfare (IDHW)
- Idaho Department of Agriculture (IDA)
- Shoshone-Bannock Tribes of the Fort Hall Reservation
- United States Forest Service (USFS)
- United States Bureau of Land Management (USBLM)
- United States Bureau of Indian Affairs (USBIA)
- United States Fish and Wildlife Service (USFWS)
- United States Environmental Protection Agency (USEPA)
- United States Geological Survey (USGS)
- Southeastern District Health Department
- IMA Selenium Committee Members
- Other Interested Stakeholders (i.e. ranchers, Greater Yellowstone Coalition, Congressional staff members, etc.)

# 2.0 FIELD AND LABORATORY METHODOLOGIES

This section describes sample collection procedures and analytical methods for the surface water and soil sampling performed for the Spring 2001 Area-Wide Investigation in May 2001. In addition, the data validation procedures are described.

## 2.1 SAMPLING LOCATIONS

### 2.1.1 Surface Water Sampling Locations

Surface water sampling locations are listed in Table 2-1. Mapped locations of these sites can be found in Figures 2-1, 2-2, and 2-3.

**TABLE 2-1**
**SURFACE WATER SAMPLING LOCATIONS**

| Company | Mine | Facility Name | Station ID |
|---|---|---|---|
| Astaris | Dry Valley Mine | Dry Valley Mine Pit B Pond | SP061 |
| FMC and Simplot | Gay Mine | Gay Mine East Limb Pit Pond[1] | SP002 |
| | | W Pit Pond | SP025 |
| | | Z Pit Pond | SP026 |
| | | South 40 Pit Pond | SP027 |
| | | Gay Mine Pond #1 above A-12 Pit (SW53) | SP036 |
| | | Gay Mine Pond #2 above A-12 Pit (SW54) | SP037 |
| | | Gay Mine A-12 Lake in A-12 Pit (SW56) | SP038 |
| | | Gay Mine North Limb O/P Pit Pond[1] | SP039 |
| | | Gay Mine North Limb Camp Site Pit Lake[1] | SP040 |
| | | Gay Mine East Limb North Pond | SP041 |
| Nu-West | North Maybe Mine | North Maybe Mine Pit Pond | SP044 |
| | | North Maybe Mine Upper Big Draw Dump Seep[1] | DS004 |
| | | North Maybe Mine East Mill Dump Seep | DS005 |
| | Champ Mine | Champ Mine Pit Pond | SP045 |
| | | Champ Mine Extension Pit Pond | SP046 |
| | | Champ Mine Goodheart Creek Seep | DS006 |
| | Mountain Fuel Mine | Mountain Fuel Mine Stock Pond | SP003 |
| | | Mountain Fuel Mine Spring #2 | SP004 |
| | | Mountain Fuel Mine Spring #3 | SP005 |
| | | Mountain Fuel Mine North Pit Pond | SP047 |
| | | Mountain Fuel Mine East Limb Pit Pond | SP048 |
| | | Mountain Fuel Mine Seep #1 (SW7) | DS007 |
| | | Mountain Fuel Mine Seep #2 (SW8) | DS008 |
| | | Mountain Fuel New Spring #1 (SW6) | DS020 |
| | Rasmussen Ridge Mine | Rasmussen Ridge Mine Unit I Overburden Runoff Pond #4 | SP060 |
| | | Rasmussen Ridge Mine Unit I Overburden Dump Seep | DS009 |
| Monsanto | Ballard Mine | Ballard Mine Dredge Pond | SP010 |
| | | Ballard Mine Upper Elk Pond | SP011 |
| | | Ballard Mine Lower Elk Pond | SP012 |
| | | Ballard Mine Northeast Pond[1] | SP013 |

**TABLE 2-1**
**SURFACE WATER SAMPLING LOCATIONS**

| Company | Mine | Facility Name | Station ID |
|---|---|---|---|
| Monsanto (continued) | Ballard Mine (continued) | Ballard Mine Pit #4 Stock Pond | SP059 |
| | | Ballard Mine Garden Hose Seep | DS027 |
| | Henry Mine | Henry Mine Henry Pond | SP014 |
| | | Henry Mine Smith Pond | SP015 |
| | | Henry Mine Center Henry Pond | SP016 |
| | | Henry Mine South Pit Pond | SP055 |
| | | Henry Mine South Pit Overburden Dump Seep[1] | DS016 |
| | | Henry Mine South Pit Overburden Dump Limestone Drain (FD002) | DS022 |
| | Enoch Valley Mine | Enoch Valley Mine South Pond | SP017 |
| | | Enoch Valley Mine Keyhole Pond | SP018 |
| | | Enoch Valley Mine Bat Cave Pond | SP019 |
| | | Enoch Valley Mine West Pond | SP020 |
| | | Enoch Valley Mine Stock Pond | SP021 |
| | | Enoch Valley Mine Tipple Pond | SP022 |
| | | Enoch Valley Mine Haul Road Pond | SP023 |
| | | Enoch Valley Mine Shop Pond (SW30) | SP031 |
| | | Enoch Valley West Dump Seep | DS025 |
| | | Enoch Valley South Dump Seep | DS026 |
| Rhodia | Wooley Valley Mine | Wooley Valley Mine Unit I Overburden Pond[1] | SP006 |
| | | Wooley Valley Mine Unit III Shop Pond | SP007 |
| | | Wooley Valley Mine Unit III Overburden Pond | SP008 |
| | | Wooley Valley Mine Large Haul Road Pond (SW39) | SP032 |
| | | Wooley Valley Mine Upper Angus Creek Reservoir (SW43) | SP033 |
| | | Wooley Valley Mine Unit I Pit Pond[1] | SP049 |
| | | Wooley Valley Mine Unit III Pit Pond (South) (MP021) | SP050 |
| | | Wooley Valley Mine Unit III Pit Pond (North) (MP022) | SP051 |
| | | Wooley Valley Mine Unit I Overburden Dump Seep | DS010 |
| | | Wooley Valley Mine Unit III Overburden Dump Seep | DS011 |
| | | Wooley Valley Mine Unit IV Overburden Dump Seep | DS012 |
| Simplot | Lanes Creek Mine | Lanes Creek Mine Pond | SP009 |
| | Conda Mine | Dredge Pond | SP030 |
| | | Conda Mine Hoorah Hollow Pond (SW69) | SP034 |
| | | Conda Mine NL4 Pond (SW71) | SP035 |
| | | Conda Mine South Stock Pond[1] | SP043 |
| | | Conda Mine Middle Limb Pit Pond[1] | SP052 |
| | | Conda Mine West Limb Pit Pond[1] | SP053 |
| | | Conda Mine Waste Dump South Woodall Seep | DS015 |
| | | Conda Mine Meadow Dump Seep | DS017 |
| | | Conda Mine Dump Seep #4 | DS018 |
| | | Conda Mine Dump Seep #7 | DS019 |
| | | Conda Mine French Drain (FD001) | DS021 |
| | | Conda Mine Dump Seep #2 | DS023 |
| | | Conda Mine Dump Seep #3 | DS024 |
| | Smoky Canyon Mine | Smoky Canyon Mine A Pit Pond (MP032) | SP054 |

| TABLE 2-1<br>SURFACE WATER SAMPLING LOCATIONS | | | |
|---|---|---|---|
| **Company** | **Mine** | **Facility Name** | **Station ID** |
| Simplot (continued) | Smoky Canyon Mine (continued) | Smoky Canyon Mine Dump Seep DP-10 | DS028 |
| | | Smoky Canyon Mine Dump Seep DP-7 | DS029 |
| Note: Parentheses after facility name indicate a past sampling ID for a site.<br>[1] Station was dry and no sample was collected. | | | |

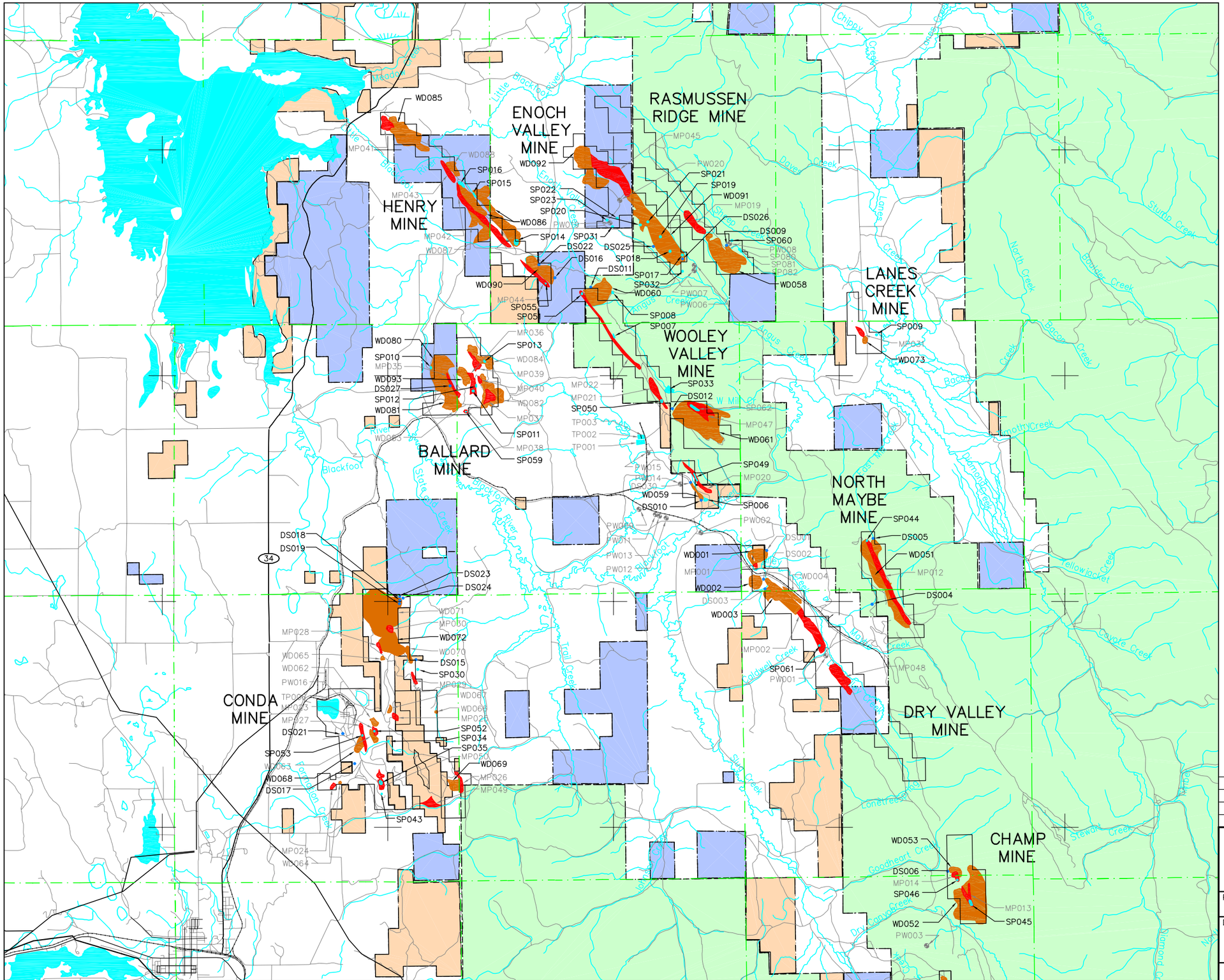
### 2.1.2 Soil Sampling Locations

Soil samples were collected from areas on waste rock dumps that best represented:

- surface exposures of the waste zone (middle, lower or upper) materials from the Meade Peak Phosphatic Shale Member of the Phosphoria Formation (black shales);
- the oldest exposed surfaces; and,
- vegetated, low-gradient areas in well-drained landscape positions (TtEMI, 2001c).

Local mine personnel accompanied the MWH field team to determine, by visual observation and personal knowledge, which sites best satisfied the given guidelines. During the first day of field sampling, IDEQ and TtEMI personnel were on-site and directed the selection of sampling locations at Enoch Valley Mine and Henry Mine.

Three surface soil samples were collected from each mine in the Resource Area. When possible, each of the three samples was collected from a different waste rock dump. The waste rock dumps sampled are listed in Table 2-2, and their locations are shown in Figures 2-1, 2-2, and 2-3.




# LEGEND

- CONTOURS
- CREEKS/RIVERS
- LAKES
- MARSH
- ROADS
- RAILROAD
- STATE LINE
- COUNTY LINE

- NATIONAL FOREST
- BUREAU OF LAND MANAGEMENT
- STATE OF IDAHO
- FORT HALL INDIAN RESERVATION
- MP001 — MINE PIT LOCATION
- SP001 / TP001 — STOCKPOND LOCATION/TAILINGS POND
- WD001 — WASTE ROCK DUMP LOCATION
- PW001 — PRODUCTION WELL
- DS001 — WASTE ROCK DUMP SEEP
- TP001 — TAILINGS POND

NOTE:
ONLY FACILITIES LABELED IN BLACK WERE SAMPLED DURING THE SPRING 2001 AREA WIDE INVESTIGATION.


MAP KEY

SCALE
0 5000 10,000
Feet

| REV. No. | REVISIONS | DATE | DESIGN BY | DRAWN BY | REVIEWED AND SIGNED BY |
|---|---|---|---|---|---|
| 0 | Issued for Review | 6/14/00 | P.Stenhouse | J.Schulz | P.Stenhouse |

IDAHO MINING ASSOCIATION
SELENIUM COMMITTEE

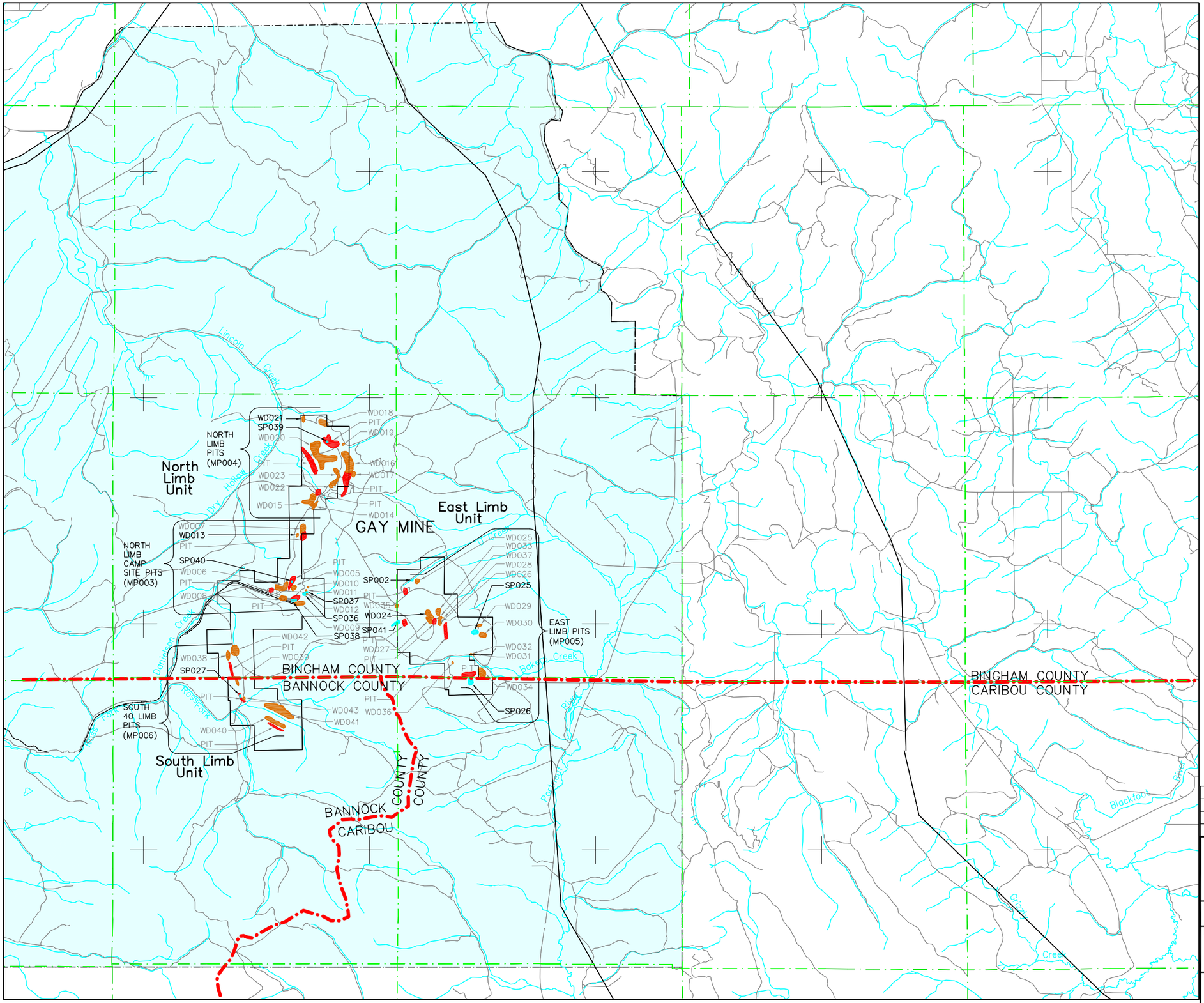
PROJECT:
SPRING 2001 AREA WIDE INVESTIGATION

DRAWING TITLE:
FACILITY LOCATIONS

MONTGOMERY WATSON

Sheet 1 Of 1 Sheets
SCALE: As Shown
DRAWING No. FIG 2-1

AutoCAD FILE: Surfmonitor.dwg PROJECT NUMBER: 1227028.021807




# LEGEND

- CREEKS/RIVERS
- COUNTY LINE
- ROADS
- RAILROAD
- TOWNSHIP–RANGE LINE
- FORT HALL INDIAN RESERVATION
- PIT LOCATION
- STOCK POND LOCATION
- WASTE ROCK DUMP LOCATION

NOTE:
ONLY FACILITIES LABELED IN BLACK WERE SAMPLED DURING THE SPRING 2001 AREA WIDE INVESTIGATION.

| REV. No. | REVISIONS | DATE | DESIGN BY | DRAWN BY | REVIEWED AND SIGNED BY |
|---|---|---|---|---|---|
| 0 | Issued for Review | 6/13/00 | P.Stenhouse | J.Schulz | P.Stenhouse |

IDAHO MINING ASSOCIATION
SELENIUM COMMITTEE

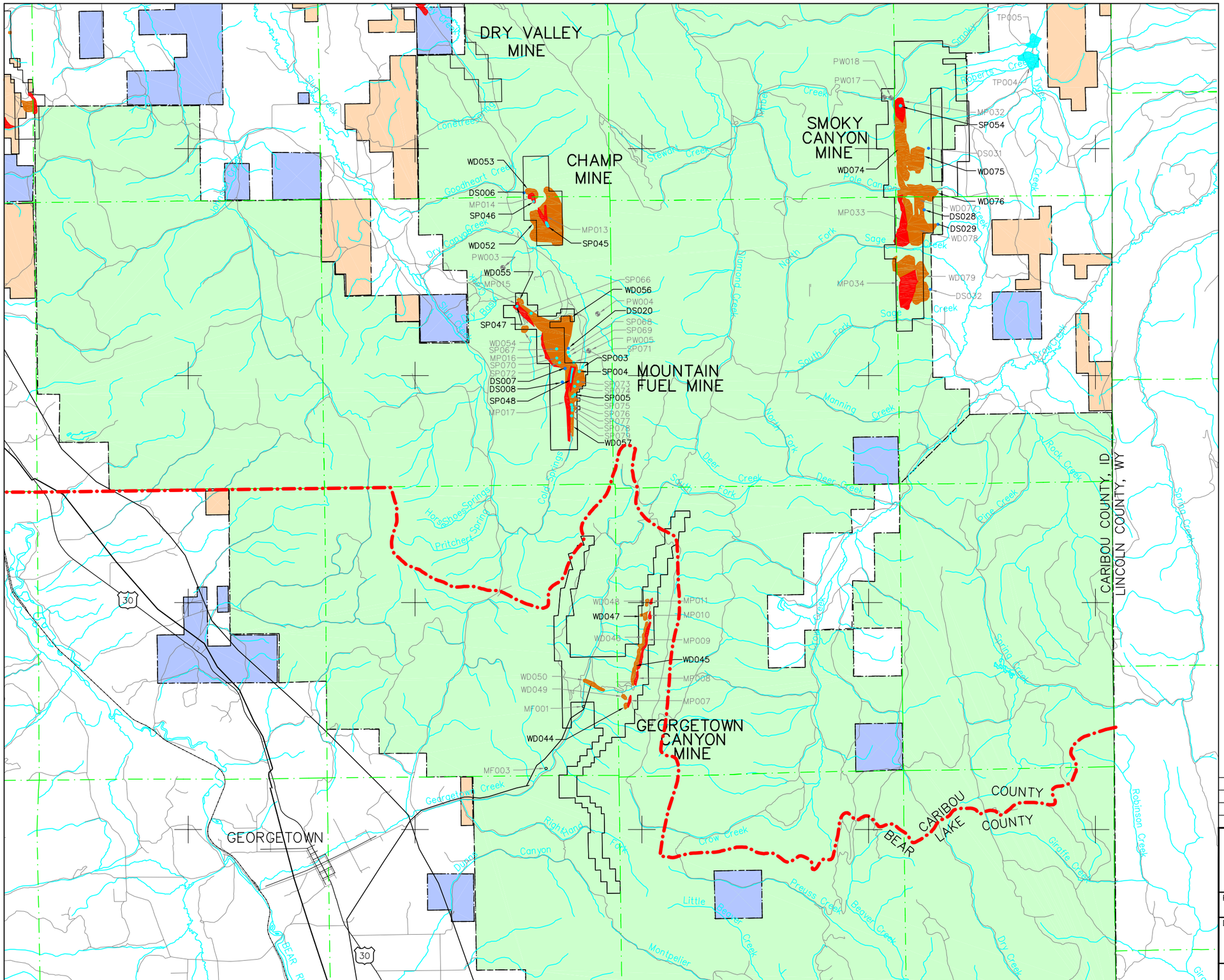
PROJECT:
SPRING 2001 AREA WIDE INVESTIGATION

DRAWING TITLE:
FACILITY LOCATIONS

MONTGOMERY WATSON

Sheet 1 Of 1 Sheets
SCALE: As Shown
DRAWING No. FIG 2-2

AutoCAD FILE: Gaminline.dwg PROJECT NUMBER: 1227028.021807




# LEGEND

- CREEKS/RIVERS
- LAKES
- ROADS
- RAILROAD
- STATE LINE
- COUNTY LINE
- NATIONAL FOREST
- STATE OF IDAHO
- BUREAU OF LAND MANAGEMENT
- MP001 MINE PIT LOCATION
- WD001 WASTE ROCK DUMP LOCATION
- DS001 WASTE ROCK DUMP SEEP
- PW001 PRODUCTION WELL
- TP001 TAILINGS POND
- MF001 MINE FACILITY

NOTE:
ONLY FACILITIES LABELED IN BLACK WERE SAMPLED DURING THE SPRING 2001 AREA WIDE INVESTIGATION.


MAP KEY

N

SCALE
0 5000 10,000
Feet

| REV. No. | REVISIONS | DATE | DESIGN BY | DRAWN BY | REVIEWED AND SIGNED BY |
|---|---|---|---|---|---|
| 0 | Issued for Review | 6/13/00 | P.Stenhouse | J.Schulz | P.Stenhouse |

IDAHO MINING ASSOCIATION
SELENIUM COMMITTEE

PROJECT:
SPRING 2001 AREA WIDE INVESTIGATION

DRAWING TITLE:
FACILITY LOCATIONS

MONTGOMERY WATSON

Sheet 1 Of 1 Sheets
SCALE: As Shown
DRAWING No. FIG 2-3

AutoCAD FILE: Smoky-George.dwg PROJECT NUMBER: 12270.28.021807

**TABLE 2-2**
**WASTE ROCK DUMP SAMPLING LOCATIONS**

| Company | Mine | Facility Name | Station ID |
|---|---|---|---|
| Astaris | Dry Valley Mine | Dry Valley Mine A Dump | WD001 |
| | | Dry Valley Mine North B Dump | WD002 |
| | | Dry Valley Mine South B Dump | WD003 |
| FMC and Simplot | Gay Mine | Gay Mine Mill Shale Pile 19 | WD013 |
| | | Gay Mine North Limb Dump 25 | WD021 |
| | | Gay Mine East Limb Main Fill | WD024 |
| Nu-West | Georgetown Canyon Mine | Georgetown Canyon Mine Dump #1 | WD044 |
| | | Georgetown Canyon Mine Dump #2 | WD045 |
| | | Georgetown Canyon Mine Dump #4 | WD047 |
| | | Central Farmers Plant Ore Stockpile | WD050 |
| | North Maybe Mine | North Maybe Mine Waste Dump | WD051[1] |
| | Champ Mine | Champ Mine Dump | WD052 |
| | | Champ Mine Extension Dump | WD053 |
| | Mountain Fuel Mine | Mountain Fuel Mine Saddle Dump | WD055 |
| | | Mountain Fuel Mine Valley Dump | WD056 |
| | | Mountain Fuel Mine East Limb Dump | WD057 |
| | Rasmussen Ridge Mine | Rasmussen Ridge Mine South Pit Dump | WD058 |
| Rhodia | Wooley Valley Mine | Wooley Valley Mine Unit I Overburden Dump | WD059 |
| | | Wooley Valley Mine Unit III Overburden Dump | WD060 |
| | | Wooley Valley Mine Unit IV Overburden Dump | WD061 |
| Simplot | Conda Mine | Conda Mine West Limb Waste Dump | WD068 |
| | | Conda Mine North Trail Waste Dump | WD069 |
| | | Conda Mine Woodall Waste Dump | WD072 |
| | Lanes Creek Mine | Lanes Creek Mine Waste Dump | WD073 |
| | Smoky Canyon Mine | Smoky Canyon Mine Waste Dump A1 | WD074 |
| | | Smoky Canyon Mine Pit A Backfill | WD075 |
| | | Smoky Canyon Mine Pole Canyon Waste Dump | WD076 |
| Monsanto | Ballard Mine | Ballard Mine Pit #1 Overburden Dump #1 | WD080 |
| | | Ballard Mine Pit #1 Overburden Dump #2 | WD081 |
| | | Ballard Mine Pit #2 Overburden Dump | WD093 |
| | Henry Mine | Henry Mine North Pit Overburden Dump | WD085 |
| | | Henry Mine Center Pit #1 Overburden Dump | WD086 |
| | | Henry Mine South Pit Overburden Dump | WD090 |
| | Enoch Valley Mine | Enoch Valley Mine Overburden Dump | WD091 |
| | | Enoch Valley Mine Canyon Fill Dump | WD092 |

[1] WD051 samples were labeled as WD095, WD096, and WD097 in the field.

## 2.2 SAMPLING AND ANALYSES

### 2.2.1 Surface Water Sampling and Analyses

Surface water sampling was conducted following the procedures outlined in the Spring 2001 Area-Wide Investigation Sampling and Analysis Plan (SAP) (MW, 2001). Before sampling began, one change was made to the water sampling protocol at the request of IDEQ. Total dissolved solids (TDS) and total suspended solids (TSS) samples were collected by submerging

the sample bottle directly into the stock pond or dump seep. Therefore, no equipment blanks or equipment rinseate blanks were collected for TDS and TSS.

Surface water samples were analyzed for the parameters presented in Table 5-2, *Surface Water Sample Analytical Suite*. The University of Idaho ASL tested for all analytes listed except total organic carbon (TOC) which was done by APC Laboratories in Chino, California.

**TABLE 2-3**
**SURFACE WATER ANALYTICAL SUITE**

| Parameter | Method | Estimated Detection Limit | Units | Holding Time |
|---|---|---|---|---|
| Aluminum | 200.8, ICP | 0.001 | mg/L | 180 days |
| Antimony | 200.8, ICP | 0.0025 | mg/L | 180 days |
| Arsenic | 200.8, ICP | 0.0005 | mg/L | 180 days |
| Barium | 200.7, ICP | 0.01 | mg/L | 180 days |
| Beryllium | 200.7, ICP | 0.005 | mg/L | 180 days |
| Boron | 200.7, ICP | 0.025 | mg/L | 180 days |
| Cadmium | 200.8, ICP | 0.00013 | mg/L | 180 days |
| Chromium | 200.8, ICP | 0.0005 | mg/L | 180 days |
| Copper | 200.8, ICP | 0.00013 | mg/L | 180 days |
| Lead | 200.8, ICP | 0.00025 | mg/L | 180 days |
| Manganese | 200.7, ICP | 0.002 | mg/L | 180 days |
| Mercury | 245.7 | 0.0005 | mg/L | 180 days |
| Molybdenum | 200.8, ICP | 0.0025 | mg/L | 180 days |
| Nickel | 200.8, ICP | 0.00013 | mg/L | 180 days |
| Selenium | ICP-HG | 0.001 | mg/L | 180 days |
| Silver | 200.8, ICP | 0.00025 | mg/L | 180 days |
| Thallium | 200.8, ICP | 0.0025 | mg/L | 180 days |
| Uranium | 200.8, ICP | 0.0001 | mg/L | 180 days |
| Vanadium | 200.8, ICP | 0.00025 | mg/L | 180 days |
| Zinc | 200.7, ICP | 0.01 | mg/L | 180 days |
| Fluoride | 300.0 | 0.1 | mg/L | 28 days |
| Calcium | 200.7, ICP | 0.02 | mg/L | 180 days |
| Bicarbonate Alkalinity | 310.1 | 3 | mg $CaCO_3$/L | ASAP |
| Carbonate Alkalinity | 310.1 | 3 | mg $CaCO_3$/L | ASAP |
| Chloride | 300.0 | 0.1 | mg/L | 28 days |
| Hydroxide Alkalinity | 310.1 | 3 | mg $CaCO_3$/L | ASAP |
| Total Alkalinity | 310.1 | | | |
| Iron | 200.7, ICP | 0.01 | mg/L | 180 days |
| Magnesium | 200.7, ICP | 0.005 | mg/L | 180 days |
| Nitrate-Nitrite | 353.2 | 0.1 | mg/L | 48 hours |
| Potassium | 200.7, ICP | 0.5 | mg/L | 180 days |
| Sulfate | 300.0 | 0.2 | mg/L | 28 days |
| Sodium | 200.7, ICP | 2 | mg/L | 180 days |
| TOC | 415.1 | 1 | mg/L | 28 days |
| TSS | 160.2 | 4 | mg/L | ASAP |
| TDS | 160.1 | 4 | mg/L | ASAP |
| Phosphorus | 365.4 | 0.01 | mg/L | 48 hours |
| pH | 150.1 | NA | NA | ASAP |

### 2.2.2 Soil Sampling and Analyses

Soil sampling was conducted following the procedures outlined in the Spring 2001 Area-Wide Investigation SAP (MW, 2001), with two changes to the sampling protocol. At the direction of IDEQ and TtEMI, samples were collected by using a hand trowel to scrape the face of a 12" deep hole. In addition, sample odor was not recorded.

Soil samples were analyzed by the University of Idaho Analytical Sciences Laboratory for the parameters presented in Table 2-4, *Soil Sample Analytical Suite*.

**TABLE 2-4**
**SOIL SAMPLE ANALYTICAL SUITE**

| Parameter | Method | Estimated Detection Limit | Reporting Units | Holding Time |
|---|---|---|---|---|
| Antimony | 3050B/6010B | 7.5 | mg/kg | 180 Days |
| Arsenic | 3050B/6010B | 7.5 | mg/kg | 180 Days |
| Barium | 3050B/6010B | 0.75 | mg/kg | 180 Days |
| Beryllium | 3050B/6010B | 0.38 | mg/kg | 180 Days |
| Boron | Na-fusion, ICP | 2.0 | mg/kg | 180 Days |
| Cadmium | 3050B/6010B | 0.75 | mg/kg | 180 Days |
| Chromium | 3050B/6010B | 1.5 | mg/kg | 180 Days |
| Copper | 3050B/6010B | 0.75 | mg/kg | 180 Days |
| Lead | 3050B/6010B | 7.5 | mg/kg | 180 Days |
| Manganese | 3050B/6010B | 0.38 | mg/kg | 180 Days |
| Mercury | 3050B/6010B | 0.0042 | mg/kg | 180 Days |
| Molybdenum | 3050B/6010B | 3.8 | mg/kg | 180 Days |
| Nickel | 3050B/6010B | 1.9 | mg/kg | 180 Days |
| Selenium | 3050B/6010B | 0.04 | mg/kg | 180 Days |
| Silver | 3050B/6010B | 0.2 | mg/kg | 180 Days |
| Thallium | 3050B/6010B | 2.0 | mg/kg | 180 Days |
| Uranium | 3050B/6010B | 2.0 | mg/kg | 180 Days |
| Vanadium | 3050B/6010B | 2.0 | mg/kg | 180 Days |
| Zinc | 3050B/6010B | 2.0 | Mg/kg | 180 Days |
| Fluoride | Na-fusion, ion chromatography | 1.0 | Mg/kg | 28 Days |
| pH | USDA # 60-21a | NA | NA | 28 Days |
| Electrical Conductivity | 9050A | 0.0013 | DS/m | None Specified |
| Organic Carbon | USDA # 60-24 | 0.06 | % | 28 Days |
| Particle Size Distribution | ASA # 9 15-4.2.2 | 0.1 | % | NA |

## 2.3 DATA VALIDATION

Data validation was conducted following USEPA protocols found in "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses" (USEPA, 1994). Data validation summaries for surface water and soil can be found in Appendices B and C.

### 2.3.1 Data Integrity

The data, as presented in the tables within this chapter, are validated in accordance with USEPA's data validation functional guidelines (USEPA, 1994). These validation guidelines require that data, at their low end, be censored. Such censorship results in the loss of information that is useful to the data analyst (Gilbert, 1987) and, thereby, potentially useful to the risk manager. As such, the uncensored version of the validated data are provided in Appendices D and E.

For the data presented in this section, per the USEPA's data validation functional guidelines, data followed by the flag "U" are censored at the associated numeric value. In other words, a concentration reported as "xU" (where x is the numeric concentration reported by the laboratory) is to be interpreted as "< x." One way a value may be censored is to be below the product $5B_{max}$, where $B_{max}$ is the maximum concentration of the analyte in question observed in a blank analyzed with the relevant sample batch. In this case what is reported is "$5B_{max}$U"; i.e., the result is censored at $5B_{max}$ and is to be interpreted as "< $5B_{max}$." Another way a value may be censored is to be below the laboratory's reporting limit, L. In this case, $x < L$ and $B_{max} < L$, and what is reported following validation is "LU"; i.e., the result is censored at L and is to be interpreted as "< L."

As a way of disclaimer, MWH points out that censorship of data in strict accordance with the USEPA data validation protocols imparts a high bias to the low end of the data set. Unfortunately, when dealing with trace levels of trace elements having low regulatory action levels, such bias has the potential to significantly compromise the quality of decision making.

### 2.3.2 Detection Limits

The University of Idaho Analytical Sciences Laboratory uses instrument detection limits (IDL) and estimated/method detection limits (EDL, MDL) when reporting data. Seven blank samples are run and the sigma value of the signal noise is multiplied by three. Sigma is a t-value for the 95% confidence limit at n-1 degrees of freedom. This initial value is then verified by running low level standards. Progressively lower concentrations of a constituent are run until a percent relative standard deviation (%RSD) of 90 – 110% is reached for three consecutive samples. The mean of the three samples becomes the new IDL. Depending on the matrix, the MDL may be different from the IDL. If samples are diluted, the MDL is a factor of the dilution, whereas samples that remain undiluted have an MDL that is equal to the IDL. (USEPA, 1996).

# 3.0 SAMPLING RESULTS

## 3.1 SURFACE WATER

Surface water results are presented in Table 3-1. USEPA validation data qualifiers for these results can be found in Appendix D. Field parameters are presented in Table 3-2.

## 3.2 SOIL

Soil results are presented in Table 3-3. USEPA validation data qualifiers for these results can be found in Appendix E.

**TABLE 3-1**
**SPRING 2001 AREA-WIDE INVESTIGATION SURFACE WATER DATA RESULTS**

| Station ID | Facility Name | Aluminum mg/L | Flag | Antimony mg/L | Flag | Arsenic mg/L | Flag | Barium mg/L | Flag | Beryllium mg/L | Flag | Boron mg/L | Flag | Cadmium mg/L | Flag | Calcium mg/L | Flag | Chromium mg/L | Flag | Copper mg/L | Flag | Iron mg/L | Flag | Lead mg/L | Flag | Magnesium mg/L | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS005 | North Maybe Mine East Mill Dump Seep | 0.034 | UJ | 0.0025 | U | 0.00055 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.00094 | | 140 | | 0.0095 | | 0.0012 | U | 0.01 | U | 0.0027 | U | 27 | |
| DS006 | Champ Mine Goodheart Creek Seep | 0.034 | UJ | 0.0025 | U | 0.00096 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 350 | | 0.008 | U | 0.0017 | | 0.01 | U | 0.0027 | U | 63 | |
| DS007 | Mountain Fuel Mine Seep #1 | 0.034 | UJ | 0.0025 | U | 0.00079 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 110 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 38 | |
| DS008 | Mountain Fuel Mine Seep #2 | 0.034 | UJ | 0.0025 | U | 0.0014 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 46 | U | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 33 | |
| DS009 | Rasmussen Ridge Mine Unit I Overburden Dump Seep | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.036 | | 0.0089 | | 490 | | 0.008 | U | 0.0039 | | 0.01 | U | 0.0027 | U | 230 | |
| DS010 | Wooley Valley Mine Unit I Overburden Dump Seep | 0.034 | UJ | 0.0025 | U | 0.00078 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 130 | | 0.008 | U | 0.0015 | | 0.011 | | 0.0027 | U | 26 | |
| DS011 | Wooley Valley Mine Unit III Overburden Dump Seep | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0012 | | 120 | | 0.028 | | 0.0016 | | 0.01 | U | 0.0027 | U | 35 | |
| DS012 | Wooley Valley Mine Unit IV Overburden Dump Seep | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 390 | | 0.021 | | 0.0014 | | 0.01 | U | 0.0027 | U | 81 | |
| DS015 | Conda Mine Waste Dump South Woodall Seep | 0.034 | UJ | 0.0025 | U | 0.0011 | | 0.065 | UJ | 0.005 | U | 0.037 | | 0.0070 | | 600 | | 0.013 | | 0.0039 | | 0.01 | U | 0.0027 | U | 220 | |
| DS017 | Conda Mine Meadow Dump Seep | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.075 | J | 0.005 | U | 0.025 | U | 0.0007 | U | 120 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 25 | |
| DS018 | Conda Mine Dump Seep #4 | 0.034 | UJ | 0.0025 | U | 0.00097 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0061 | | 460 | | 0.017 | | 0.0021 | | 0.01 | U | 0.0027 | U | 100 | |
| DS019 | Conda Mine Dump Seep #7 | 0.034 | UJ | 0.0025 | U | 0.0012 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0047 | | 560 | | 0.008 | U | 0.0033 | | 0.022 | | 0.0027 | U | 120 | |
| DS020 | Mountain Fuel New Spring #1 | 0.034 | UJ | 0.0025 | U | 0.0042 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.012 | | 290 | | 0.008 | U | 0.0015 | | 0.058 | | 0.0027 | U | 80 | |
| DS021 | Conda Mine French Drain | 0.034 | UJ | 0.0025 | U | 0.0016 | | 0.099 | J | 0.005 | U | 0.025 | U | 0.0007 | U | 190 | | 0.008 | U | 0.0012 | U | 0.022 | | 0.0027 | U | 50 | |
| DS022 | Henry Mine South Pit Overburden Dump Limestone Drain | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 100 | | 0.018 | | 0.0012 | U | 0.01 | U | 0.0027 | U | 44 | |
| DS023 | Conda Mine Dump Seep #2 | 0.034 | UJ | 0.0025 | U | 0.0011 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 200 | | 0.008 | U | 0.0015 | | 0.01 | U | 0.0027 | U | 48 | |
| DS024 | Conda Mine Dump Seep #3 | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0033 | | 550 | | 0.012 | | 0.0033 | | 0.01 | U | 0.0027 | U | 140 | |
| DS025 | Enoch Valley Mine West Dump Seep | 0.034 | UJ | 0.0025 | U | 0.0081 | | 0.065 | UJ | 0.005 | U | 0.026 | | 0.00080 | | 250 | | 0.019 | | 0.0015 | | 6.5 | | 0.0027 | U | 64 | |
| DS026 | Enoch Valley Mine South Dump Seep | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0049 | | 140 | | 0.0085 | | 0.0018 | | 0.01 | U | 0.0027 | U | 79 | |
| DS027 | Ballard Mine Garden Hose Seep | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 130 | | 0.023 | | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| DS028 | Smoky Canyon Mine Dump Seep DP-10 | 0.034 | UJ | 0.0025 | U | 0.00074 | | 0.065 | UJ | 0.005 | U | 0.15 | | 0.00094 | | 210 | | 0.008 | U | 0.0017 | | 0.01 | U | 0.0027 | U | 60 | |
| DS029 | Smoky Canyon Mine Dump Seep DP-7 | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.066 | J | 0.005 | U | 0.037 | | 0.0088 | | 480 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 58 | |
| SP003 | Mountain Fuel Stock Pond | 0.034 | UJ | 0.0025 | U | 0.0046 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 130 | | 0.008 | U | 0.0015 | | 0.026 | | 0.0027 | U | 46 | |
| SP004 | Mountain Fuel Mine Spring #2 | 0.034 | UJ | 0.0031 | | 0.0040 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0017 | | 150 | | 0.010 | | 0.0038 | | 0.01 | U | 0.0027 | U | 30 | |
| SP005 | Mountain Fuel Mine Spring #3 | 0.034 | UJ | 0.0025 | U | 0.0030 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 63 | | 0.008 | U | 0.0016 | | 0.01 | U | 0.0027 | U | 21 | U |
| SP007 | Wooley Valley Mine Unit III Shop Pond | 0.034 | UJ | 0.0025 | U | 0.0030 | | 0.065 | UJ | 0.005 | U | 0.032 | | 0.0007 | U | 46 | U | 0.008 | U | 0.0016 | | 0.033 | | 0.0027 | U | 21 | U |
| SP008 | Wooley Valley Mine Unit III Overburden Pond | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 53 | | 0.008 | U | 0.0012 | U | 0.021 | | 0.0027 | U | 43 | |
| SP009 | Lanes Creek Mine Pond | 0.034 | UJ | 0.0025 | U | 0.0046 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 46 | U | 0.008 | U | 0.0044 | | 0.016 | | 0.0027 | U | 21 | U |
| SP010 | Ballard Mine Dredge Pond | 0.034 | UJ | 0.0025 | U | 0.0033 | | 0.065 | UJ | 0.005 | U | 0.036 | | 0.0007 | U | 240 | | 0.023 | | 0.0043 | | 0.01 | U | 0.0027 | U | 57 | |
| SP011 | Ballard Mine Upper Elk Pond | 0.034 | UJ | 0.0025 | U | 0.0061 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0013 | | 46 | U | 0.008 | U | 0.0041 | | 0.01 | U | 0.0027 | U | 21 | U |
| SP012 | Ballard Mine Lower Elk Pond | 0.034 | UJ | 0.0025 | U | 0.0039 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.00097 | | 46 | U | 0.010 | | 0.0034 | | 0.01 | U | 0.0027 | U | 21 | U |
| SP014 | Henry Mine Henry Pond | 0.034 | UJ | 0.0025 | U | 0.0016 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 90 | | 0.008 | U | 0.0013 | | 0.01 | U | 0.0027 | U | 56 | |
| SP015 | Henry Mine Smith Pond | 0.034 | UJ | 0.0025 | U | 0.0021 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 120 | | 0.012 | | 0.0020 | | 0.01 | U | 0.0027 | U | 35 | |
| SP016 | Henry Mine Center Henry Pond | 0.034 | UJ | 0.0025 | U | 0.0013 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 91 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| SP017 | Enoch Valley Mine South Pond | 0.034 | UJ | 0.0025 | U | 0.0010 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 250 | | 0.008 | U | 0.0024 | | 0.01 | U | 0.0027 | U | 78 | |
| SP018 | Enoch Valley Mine Keyhole Pond | 0.074 | J | 0.0025 | U | 0.00082 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.050 | | 390 | | 0.008 | U | 0.0030 | | 0.01 | U | 0.0027 | U | 140 | |
| SP019 | Enoch Valley Mine Bat Cave Pond | 0.034 | UJ | 0.0025 | U | 0.0033 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 99 | | 0.008 | U | 0.0021 | | 0.01 | U | 0.0027 | U | 29 | |
| SP020 | Enoch Valley Mine West Pond | 0.034 | UJ | 0.0025 | U | 0.0015 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 62 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| SP021 | Enoch Valley Mine Stock Pond | 0.034 | UJ | 0.0025 | U | 0.0016 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0046 | | 180 | | 0.008 | U | 0.0016 | | 0.01 | U | 0.0027 | U | 51 | |
| SP022 | Enoch Valley Mine Tipple Pond | 0.034 | UJ | 0.0025 | U | 0.0018 | | 0.068 | J | 0.005 | U | 0.082 | | 0.0007 | U | 140 | | 0.008 | U | 0.0013 | | 0.01 | U | 0.0027 | U | 26 | |
| SP023 | Enoch Valley Mine Haul Road Pond | 0.034 | UJ | 0.0025 | U | 0.0036 | | 0.065 | UJ | 0.005 | U | 0.32 | | 0.0007 | U | 120 | | 0.008 | U | 0.0020 | | 0.01 | U | 0.0027 | U | 47 | |
| SP025 | Gay Mine W Pit Pond | 0.034 | UJ | 0.0025 | U | 0.030 | | 0.065 | UJ | 0.005 | U | 0.073 | | 0.0007 | U | 46 | U | 0.008 | U | 0.0016 | | 0.01 | U | 0.0027 | U | 63 | |
| SP026 | Gay Mine Z Pit Pond | 0.034 | UJ | 0.0025 | U | 0.0011 | | 0.065 | UJ | 0.005 | U | 0.033 | | 0.0007 | U | 46 | U | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 30 | |
| SP027 | Gay Mine South 40 Pit Pond | 0.068 | J | 0.0025 | U | 0.0028 | | 0.074 | J | 0.005 | U | 0.034 | | 0.0007 | U | 69 | | 0.008 | U | 0.0019 | | 0.01 | U | 0.0027 | U | 42 | |
| SP030 | Conda Mine Dredge Pond | 0.034 | UJ | 0.0025 | U | 0.0053 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 46 | U | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| SP031 | Enoch Valley Mine Shop Pond | 0.034 | UJ | 0.0025 | U | 0.0027 | | 0.065 | UJ | 0.005 | U | 0.087 | | 0.0016 | | 83 | | 0.008 | U | 0.0021 | | 0.079 | | 0.0027 | U | 21 | U |
| SP032 | Wooley Valley Mine Large Haul Road Pond | 0.034 | UJ | 0.0025 | U | 0.00046 | | 0.065 | UJ | 0.005 | U | 0.040 | | 0.0007 | U | 120 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 41 | |
| SP033 | Wooley Valley Mine Upper Angus Creek Reservoir | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 130 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 40 | |
| SP034 | Cond Mine Hoorah Hollow Pond | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 49 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| SP035 | Conda Mine NL4 Pond | 0.034 | UJ | 0.0025 | U | 0.0022 | | 0.065 | UJ | 0.005 | U | 0.032 | | 0.0026 | | 100 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| SP036 | Gay Mine Pond #1 above A-12 Pit | 0.034 | UJ | 0.0025 | U | 0.0033 | | 0.11 | J | 0.005 | U | 0.094 | | 0.0007 | U | 140 | | 0.008 | U | 0.0014 | | 0.021 | | 0.0027 | U | 74 | |
| SP037 | Gay Mine Pond #2 above A-12 Pit | 0.034 | UJ | 0.0025 | U | 0.0026 | | 0.12 | J | 0.005 | U | 0.072 | | 0.0007 | U | 140 | | 0.008 | U | 0.0015 | | 0.023 | | 0.0027 | U | 69 | |
| SP038 | Gay Mine A-12 Lake in A-12 Pit | 0.034 | UJ | 0.0025 | U | 0.0023 | | 0.073 | J | 0.005 | U | 0.063 | | 0.0007 | U | 140 | | 0.008 | U | 0.0018 | | 0.01 | U | 0.0027 | U | 69 | |
| SP041 | Gay Mine East Limb North Pond | 0.034 | UJ | 0.0025 | U | 0.0019 | | 0.080 | J | 0.005 | U | 0.045 | | 0.0007 | U | 100 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 37 | |
| SP044 | North Maybe Mine Pit Pond | 0.034 | UJ | 0.0025 | U | 0.0035 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0010 | | 46 | U | 0.038 | | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| SP045 | Champ Mine Pit Pond | 0.034 | UJ | 0.0025 | U | 0.0013 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0026 | | 190 | | 0.008 | U | 0.0013 | | 0.01 | U | 0.0027 | U | 30 | |
| SP046 | Champ Mine Extension Pit Pond | 0.034 | UJ | 0.0025 | U | 0.0017 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.00083 | | 46 | U | 0.008 | U | 0.0024 | | 0.01 | U | 0.0027 | U | 21 | U |
| SP047 | Mountain Fuel Mine North Pit Pond | 0.034 | UJ | 0.0025 | U | 0.0013 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0036 | | 75 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| SP048 | Mountain Fuel Mine East Limb Pit Pond | 0.034 | UJ | 0.0025 | U | 0.0012 | | 0.073 | J | 0.005 | U | 0.025 | U | 0.0058 | | 130 | | 0.008 | U | 0.0015 | | 0.01 | U | 0.0027 | U | 33 | |
| SP050 | Wooley Valley Mine Unit III Pit Pond (South) | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 46 | U | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |
| SP051 | Wooley Valley Mine Unit III Pit Pond (North) | 0.034 | UJ | 0.0025 | U | 0.00087 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 46 | U | 0.008 | U | 0.0014 | | 0.01 | U | 0.0027 | U | 21 | U |
| SP054 | Smoky Canyon Mine A Pit Pond | 0.034 | UJ | 0.0025 | U | 0.00077 | | 0.065 | UJ | 0.005 | U | 0.036 | | 0.0007 | U | 46 | U | 0.008 | U | 0.0012 | U | 6.0 | | 0.0027 | U | 21 | U |
| SP055 | Henry Mine South Pit Pond | 0.034 | UJ | 0.0025 | U | 0.00080 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.039 | | 260 | | 0.014 | | 0.0017 | | 0.01 | U | 0.0027 | U | 63 | |
| SP059 | Ballard Mine Pit #4 Stock Pond | 0.038 | J | 0.0025 | U | 0.0030 | | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0007 | U | 46 | U | 0.0088 | | 0.0021 | | 0.01 | U | 0.0027 | U | 21 | U |
| SP060 | Rasmussen Ridge Mine Unit I Overburden Runoff Pond #4 | 0.034 | UJ | 0.0025 | U | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0013 | | 480 | | 0.008 | U | 0.0036 | | 0.011 | | 0.0027 | U | 180 | |
| SP061 | Dry Valley Mine Pit B Ponc | 0.034 | UJ | 0.0029 | | 0.0005 | U | 0.065 | UJ | 0.005 | U | 0.025 | U | 0.0094 | | 92 | | 0.008 | U | 0.0012 | U | 0.01 | U | 0.0027 | U | 21 | U |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analyses.
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation process.
Data qualifier definitions are:
(U) - The material was analyzed for, but was not detected. The value preceeding the U indicates the value below which results are considered undetected.
(J) - The sample result is an estimated quantity.
(R) - The data are unusable.
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise. The value preceeding the UJ indicates the value below which results are considered undetected.
na: Not available
ND: Not detected

**TABLE 3-1**
**SPRING 2001 AREA-WIDE INVESTIGATION SURFACE WATER DATA RESULTS**

| Station ID | Facility Name | Manganese mg/L | Flag | Molybdenum mg/L | Flag | Nickel mg/L | Flag | Potassium mg/L | Flag | Silver mg/L | Flag | Sodium mg/L | Flag | Thallium mg/L | Flag | Uranium mg/L | Flag | Vanadium mg/L | Flag | Zinc mg/L | Flag | Bicarbonate Alkalinity mg $CaCO_3$/L | Flag | Carbonate Alkalinity mg $CaCO_3$/L | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS005 | North Maybe Mine East Mill Dump Seep | 0.002 | U | 0.0085 | J | 0.0048 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.024 | J | 230 | U | 3.0 | U |
| DS006 | Champ Mine Goodheart Creek Seep | 0.52 | | 0.0029 | J | 0.025 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.034 | J | 290 | | 3.0 | U |
| DS007 | Mountain Fuel Mine Seep #1 | 0.013 | | 0.0064 | J | 0.011 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| DS008 | Mountain Fuel Mine Seep #2 | 0.011 | | 0.006 | J | 0.0038 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 9.0 | |
| DS009 | Rasmussen Ridge Mine Unit I Overburden Dump Seep | 2.3 | | 0.0025 | UJ | 0.66 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.010 | | 0.0095 | UJ | 1.8 | J | 230 | U | 3.0 | U |
| DS010 | Wooley Valley Mine Unit I Overburden Dump Seep | 0.0045 | | 0.0025 | UJ | 0.0046 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.011 | J | 250 | | 3.0 | U |
| DS011 | Wooley Valley Mine Unit III Overburden Dump Seep | 0.014 | | 0.0025 | UJ | 0.0059 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0098 | J | 0.014 | J | 300 | | 3.0 | U |
| DS012 | Wooley Valley Mine Unit IV Overburden Dump Seep | 17 | | 0.0037 | J | 0.031 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.020 | J | 340 | | 3.0 | U |
| DS015 | Conda Mine Waste Dump South Woodall Seep | 0.002 | U | 0.088 | J | 0.16 | | 9.5 | U | 0.0021 | U | 25 | J | 0.0025 | U | 0.016 | | 0.015 | J | 0.37 | J | 230 | U | 3.0 | U |
| DS017 | Conda Mine Meadow Dump Seep | 0.31 | | 0.0025 | UJ | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| DS018 | Conda Mine Dump Seep #4 | 0.0068 | | 0.0075 | J | 0.12 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.015 | | 0.0096 | J | 0.35 | J | 390 | | 3.0 | U |
| DS019 | Conda Mine Dump Seep #7 | 0.51 | | 0.032 | J | 0.31 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.035 | | 0.0205 | J | 0.56 | J | 290 | | 3.0 | U |
| DS020 | Mountain Fuel New Spring #1 | 1.1 | | 0.079 | J | 0.099 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.016 | | 2.7 | J | 0.23 | J | 350 | | 3.0 | U |
| DS021 | Conda Mine French Drain | 0.045 | | 0.0045 | J | 0.016 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.050 | J | 340 | | 3.0 | U |
| DS022 | Henry Mine South Pit Overburden Dump Limestone Drain | 0.027 | | 0.0025 | UJ | 0.0054 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | J | 410 | | 3.0 | U |
| DS023 | Conda Mine Dump Seep #2 | 0.032 | | 0.0025 | UJ | 0.0045 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.017 | J | 230 | U | 3.0 | U |
| DS024 | Conda Mine Dump Seep #3 | 0.043 | | 0.0025 | UJ | 0.024 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.010 | | 0.0095 | UJ | 0.14 | J | 320 | | 3.0 | U |
| DS025 | Enoch Valley Mine West Dump Seep | 5.0 | | 0.0033 | J | 0.17 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.14 | J | 230 | U | 3.0 | U |
| DS026 | Enoch Valley Mine South Dump Seep | 0.77 | | 0.0025 | UJ | 0.021 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.071 | | 0.0095 | UJ | 0.047 | J | 320 | | 3.0 | U |
| DS027 | Ballard Mine Garden Hose Seep | 0.002 | U | 0.0025 | UJ | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.016 | J | 270 | | 3.0 | U |
| DS028 | Smoky Canyon Mine Dump Seep DP-10 | 0.012 | | 0.050 | J | 0.026 | | 9.5 | U | 0.0021 | U | 55 | J | 0.0025 | U | 0.011 | | 0.0095 | UJ | 0.045 | J | 230 | U | 3.0 | U |
| DS029 | Smoky Canyon Mine Dump Seep DP-7 | 0.38 | | 0.021 | J | 0.090 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.028 | | 0.0095 | UJ | 0.23 | J | 350 | | 3.0 | U |
| SP003 | Mountain Fuel Stock Pond | 0.028 | | 0.020 | J | 0.0081 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.011 | J | 0.01 | U | 230 | U | 39 | |
| SP004 | Mountain Fuel Mine Spring #2 | 0.0032 | | 0.075 | J | 0.018 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.012 | | 0.026 | J | 0.014 | J | 230 | U | 7.0 | |
| SP005 | Mountain Fuel Mine Spring #3 | 0.073 | | 0.023 | J | 0.0044 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP007 | Wooley Valley Mine Unit III Shop Pond | 0.015 | | 0.0051 | J | 0.0061 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP008 | Wooley Valley Mine Unit III Overburden Pond | 0.10 | | 0.0025 | UJ | 0.0062 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 22 | |
| SP009 | Lanes Creek Mine Pond | 0.025 | | 0.011 | J | 0.013 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0125 | J | 0.01 | U | 230 | U | 3.0 | U |
| SP010 | Ballard Mine Dredge Pond | 0.024 | | 0.046 | J | 0.031 | | 9.8 | | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.059 | | 0.012 | J | 0.025 | J | 230 | U | 3.0 | U |
| SP011 | Ballard Mine Upper Elk Pond | 0.0036 | | 0.019 | J | 0.0091 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.048 | J | 0.01 | U | 230 | U | 9.0 | |
| SP012 | Ballard Mine Lower Elk Pond | 0.0021 | | 0.025 | J | 0.0080 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.04 | J | 0.010 | J | 230 | U | 3.0 | U |
| SP014 | Henry Mine Henry Pond | 0.017 | | 0.0040 | J | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP015 | Henry Mine Smith Pond | 0.18 | | 0.0072 | J | 0.0060 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.012 | J | 250 | | 3.0 | U |
| SP016 | Henry Mine Center Henry Pond | 0.0077 | | 0.0025 | UJ | 0.0046 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP017 | Enoch Valley Mine South Pond | 0.42 | | 0.0040 | J | 0.016 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.011 | | 0.0095 | UJ | 0.019 | J | 230 | U | 3.0 | U |
| SP018 | Enoch Valley Mine Keyhole Pond | 3.4 | | 0.022 | J | 1.5 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.010 | | 0.061 | J | 6.6 | J | 230 | U | 3.0 | U |
| SP019 | Enoch Valley Mine Bat Cave Pond | 0.002 | U | 0.0086 | J | 0.011 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.019 | J | 0.01 | U | 230 | U | 69 | |
| SP020 | Enoch Valley Mine West Pond | 0.0085 | | 0.0047 | J | 0.011 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.013 | J | 0.01 | U | 230 | U | 34 | |
| SP021 | Enoch Valley Mine Stock Pond | 0.002 | U | 0.015 | J | 0.069 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.0084 | | 0.022 | J | 0.16 | J | 230 | U | 3.0 | U |
| SP022 | Enoch Valley Mine Tipple Pond | 0.002 | U | 0.0086 | J | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.024 | J | 0.01 | U | 230 | U | 17 | |
| SP023 | Enoch Valley Mine Haul Road Pond | 0.002 | U | 0.024 | J | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.011 | | 0.026 | J | 0.01 | U | 230 | U | 4.0 | |
| SP025 | Gay Mine W Pit Pond | 0.020 | | 0.0058 | J | 0.0070 | | 19 | | 0.0021 | U | 46 | J | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 22 | |
| SP026 | Gay Mine Z Pit Pond | 0.012 | | 0.013 | J | 0.0079 | | 9.5 | U | 0.0021 | U | 30 | J | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP027 | Gay Mine South 40 Pit Pond | 0.002 | U | 0.011 | J | 0.0046 | | 9.5 | U | 0.0021 | U | 41 | J | 0.0025 | U | 0.008 | U | 0.019 | J | 0.01 | U | 230 | U | 4.4 | |
| SP030 | Conda Mine Dredge Pond | 0.043 | | 0.0025 | UJ | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 22 | |
| SP031 | Enoch Valley Mine Shop Pond | 0.036 | | 0.0093 | J | 0.022 | | 9.5 | U | 0.0021 | U | 90 | J | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.025 | J | 230 | U | 17 | |
| SP032 | Wooley Valley Mine Large Haul Road Pond | 0.15 | | 0.0025 | UJ | 0.0065 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP033 | Wooley Valley Mine Upper Angus Creek Reservoir | 0.077 | | 0.0025 | UJ | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP034 | Cond Mine Hoorah Hollow Pond | 0.002 | U | 0.0025 | UJ | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP035 | Conda Mine NL4 Pond | 0.002 | U | 0.050 | J | 0.016 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.11 | J | 0.012 | J | 230 | U | 3.0 | U |
| SP036 | Gay Mine Pond #1 above A-12 Pit | 1.2 | | 0.0050 | J | 0.0033 | U | 9.5 | U | 0.0021 | U | 100 | J | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP037 | Gay Mine Pond #2 above A-12 Pit | 0.49 | | 0.0055 | J | 0.0033 | U | 9.5 | U | 0.0021 | U | 85 | J | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP038 | Gay Mine A-12 Lake in A-12 Pit | 0.002 | U | 0.029 | J | 0.0098 | | 9.5 | U | 0.0021 | U | 80 | J | 0.0025 | U | 0.0087 | | 0.014 | J | 0.013 | J | 230 | U | 9.0 | |
| SP041 | Gay Mine East Limb North Pond | 0.082 | | 0.0025 | UJ | 0.0033 | U | 9.5 | U | 0.0021 | U | 49 | J | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP044 | North Maybe Mine Pit Pond | 0.002 | U | 0.027 | J | 0.0059 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.17 | J | 0.01 | U | 230 | U | 9.0 | |
| SP045 | Champ Mine Pit Pond | 0.0056 | | 0.042 | J | 0.049 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0177 | J | 0.066 | J | 230 | U | 3.0 | U |
| SP046 | Champ Mine Extension Pit Pond | 0.002 | U | 0.0041 | J | 0.0036 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.012 | J | 0.01 | U | 230 | U | 3.0 | U |
| SP047 | Mountain Fuel Mine North Pit Pond | 0.077 | | 0.029 | J | 0.057 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.036 | J | 0.077 | J | 230 | U | 3.0 | U |
| SP048 | Mountain Fuel Mine East Limb Pit Pond | 0.054 | | 0.023 | J | 0.034 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.072 | J | 0.058 | J | 230 | U | 3.0 | U |
| SP050 | Wooley Valley Mine Unit III Pit Pond (South) | 0.002 | U | 0.0025 | UJ | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP051 | Wooley Valley Mine Unit III Pit Pond (North) | 0.002 | U | 0.0025 | UJ | 0.0033 | U | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 14 | |
| SP054 | Smoky Canyon Mine A Pit Pond | 0.002 | U | 0.046 | J | 0.0085 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0225 | J | 0.01 | U | 230 | U | 4.0 | |
| SP055 | Henry Mine South Pit Pond | 0.002 | U | 0.036 | J | 0.96 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.038 | J | 4.0 | J | 230 | U | 3.0 | U |
| SP059 | Ballard Mine Pit #4 Stock Pond | 0.0045 | | 0.0090 | J | 0.0098 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.01 | U | 230 | U | 3.0 | U |
| SP060 | Rasmussen Ridge Mine Unit I Overburden Runoff Pond #4 | 1.1 | | 0.0025 | UJ | 0.058 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.0095 | UJ | 0.10 | J | 230 | U | 3.0 | U |
| SP061 | Dry Valley Mine Pit B Pond | 0.018 | | 0.031 | J | 0.22 | | 9.5 | U | 0.0021 | U | 22 | UJ | 0.0025 | U | 0.008 | U | 0.027 | J | 0.83 | J | 230 | U | 3.0 | U |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analyses.
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation process.
Data qualifier definitions are:
(U) - The material was analyzed for, but was not detected. The value preceeding the U indicates the value below which results are considered undetected.
(J) - The sample result is an estimated quantity.
(R) - The data are unusable.
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise. The value preceeding the UJ indicates the value below which results are considered undetected.
na: Not available
ND: Not detected

**TABLE 3-1**
**SPRING 2001 AREA-WIDE INVESTIGATION SURFACE WATER DATA RESULTS**

| Station ID | Facility Name | Chloride mg/L | Flag | Fluoride mg/L | Flag | Hydroxide Alkalinity mg $CaCO_3$/L | Flag | pH | Flag | Sulfate mg/L | Flag | Total Alkalinity mg $CaCO_3$/L | Flag | Selenium mg/L | Flag | Mercury mg/L | Flag | Nitrate-N+Nitrite-N mg/L | Flag | Total Phosphorus mg/L | Flag | Filterable Residue mg/L | Flag | Non-Filterable Res. mg/L | Flag | TOC mg/L | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS005 | North Maybe Mine East Mill Dump Seep | 12 | U | 0.30 | | 3.0 | U | 7.6 | | 150 | J | 230 | U | 0.49 | J | 0.0005 | U | 3.8 | J | 0.95 | U | 500 | | 4.0 | U | 49 | U |
| DS006 | Champ Mine Goodheart Creek Seep | 12 | U | 0.70 | | 3.0 | U | 8.1 | | 650 | J | 290 | | 0.041 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 1300 | | 7.0 | J | 49 | U |
| DS007 | Mountain Fuel Mine Seep #1 | 12 | U | 0.14 | | 3.0 | U | 7.9 | | 200 | J | 230 | U | 0.012 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 580 | | 4.0 | U | na | |
| DS008 | Mountain Fuel Mine Seep #2 | 12 | U | 0.14 | | 3.0 | U | 8.5 | | 18 | J | 230 | U | 0.001 | UJ | 0.0005 | UJ | 2.1 | U | 0.95 | U | 260 | | 4.0 | U | 49 | U |
| DS009 | Rasmussen Ridge Mine Unit I Overburden Dump Seep | 24 | | 1.7 | | 3.0 | U | 7.4 | | 1700 | J | 230 | U | 0.078 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 2800 | | 280 | J | 49 | U |
| DS010 | Wooley Valley Mine Unit I Overburden Dump Seep | 12 | U | 0.1 | U | 3.0 | U | 7.9 | | 160 | J | 250 | | 0.013 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 530 | | 33 | J | 49 | U |
| DS011 | Wooley Valley Mine Unit III Overburden Dump Seep | 12 | U | 0.47 | | 3.0 | U | 7.6 | | 160 | J | 300 | | 0.0065 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 570 | | 61 | J | 49 | U |
| DS012 | Wooley Valley Mine Unit IV Overburden Dump Seep | 12 | U | 0.65 | | 3.0 | U | 6.7 | | 97 | J | 340 | | 0.0028 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 1800 | | 72 | J | na | |
| DS015 | Conda Mine Waste Dump South Woodall Seep | 12 | U | 3.1 | | 3.0 | U | 8.0 | | 2000 | J | 230 | U | 1.8 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 3100 | | 4.0 | U | 49 | U |
| DS017 | Conda Mine Meadow Dump Seep | 12 | U | 0.12 | | 3.0 | U | 7.4 | | 160 | J | 230 | U | 0.0041 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 440 | | 4.0 | U | 49 | U |
| DS018 | Conda Mine Dump Seep #4 | 12 | U | 1.0 | | 3.0 | U | 8.0 | | 990 | J | 390 | | 0.42 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 1900 | | 68 | J | 49 | U |
| DS019 | Conda Mine Dump Seep #7 | 12 | U | 1.4 | | 3.0 | U | 7.6 | | 1400 | J | 290 | | 2.2 | J | 0.0005 | UJ | 2.1 | U | 1.4 | | 2300 | | 88 | J | 49 | U |
| DS020 | Mountain Fuel New Spring #1 | 12 | U | 0.59 | | 3.0 | U | 7.7 | | 620 | J | 350 | | 0.34 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 1400 | | 4.0 | U | 49 | U |
| DS021 | Conda Mine French Drain | 12 | U | 0.39 | | 3.0 | U | 7.7 | | 290 | J | 340 | | 0.088 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 760 | | 6.0 | J | 49 | U |
| DS022 | Henry Mine South Pit Overburden Dump Limestone Drain | 12 | U | 0.17 | | 3.0 | U | 8.0 | | 76 | J | 410 | | 0.001 | UJ | 0.0005 | U | 2.1 | U | 0.95 | U | 530 | | 39 | J | 49 | U |
| DS023 | Conda Mine Dump Seep #2 | 12 | U | 0.43 | | 3.0 | U | 7.5 | | 600 | J | 230 | U | 0.023 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 960 | | 4.0 | U | 49 | U |
| DS024 | Conda Mine Dump Seep #3 | 12 | U | NA | | 3.0 | U | 7.0 | | 1500 | J | 320 | | 0.067 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 2400 | | 73 | J | 49 | U |
| DS025 | Enoch Valley Mine West Dump Seep | 12 | U | 0.51 | | 3.0 | U | 7.2 | | 700 | J | 230 | U | 0.0026 | J | 0.0005 | U | 2.1 | U | 1.7 | | 1300 | | 130 | J | 49 | U |
| DS026 | Enoch Valley Mine South Dump Seep | 12 | U | 0.40 | | 3.0 | U | 7.9 | | 650 | J | 320 | | 0.049 | J | 0.0005 | U | 2.1 | UJ | 0.95 | U | 1300 | | 11 | J | 49 | U |
| DS027 | Ballard Mine Garden Hose Seep | 12 | U | 0.1 | U | 3.0 | U | 8.2 | | 160 | J | 270 | | 0.44 | J | 0.0005 | U | 5.0 | J | 0.95 | U | 520 | | 4.0 | U | 49 | U |
| DS028 | Smoky Canyon Mine Dump Seep DP-10 | 300 | | 0.51 | | 3.0 | U | 7.8 | | 310 | J | 230 | U | 0.53 | J | 0.0005 | UJ | 3.8 | J | 0.95 | U | 1300 | | 9.0 | J | 49 | U |
| DS029 | Smoky Canyon Mine Dump Seep DP-7 | 29 | | 0.35 | | 3.0 | U | 7.5 | | 930 | J | 350 | | 0.86 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 1800 | | 5.5 | J | 49 | U |
| SP003 | Mountain Fuel Stock Pond | 12 | U | 0.32 | | 3.0 | U | 9.3 | | 410 | J | 230 | U | 0.0066 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 690 | | 7.3 | J | 49 | U |
| SP004 | Mountain Fuel Mine Spring #2 | 12 | U | 0.49 | | 3.0 | U | 8.4 | | 350 | J | 230 | U | 0.026 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 700 | | 4.0 | U | 49 | U |
| SP005 | Mountain Fuel Mine Spring #3 | 12 | U | 0.31 | | 3.0 | U | 8.3 | | 69 | J | 230 | U | 0.0037 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 310 | | 4.0 | U | 49 | U |
| SP007 | Wooley Valley Mine Unit III Shop Pond | 12 | U | 0.27 | | 3.0 | U | 8.0 | | 26 | J | 230 | U | 0.0067 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 200 | | 6.0 | J | 49 | U |
| SP008 | Wooley Valley Mine Unit III Overburden Pond | 28 | | 0.14 | | 3.0 | U | 8.9 | | 210 | J | 230 | U | 0.001 | UJ | 0.0005 | UJ | 2.1 | U | 0.95 | U | 460 | | 4.0 | U | 49 | U |
| SP009 | Lanes Creek Mine Pond | 12 | U | 0.34 | | 3.0 | U | 7.8 | | 11 | J | 230 | U | 0.053 | J | 0.0005 | UJ | 2.4 | J | 0.95 | U | 100 | | 10 | J | 49 | U |
| SP010 | Ballard Mine Dredge Pond | 12 | U | 0.92 | | 3.0 | U | 8.0 | | 630 | J | 230 | U | 0.58 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 1200 | | 10 | J | 49 | U |
| SP011 | Ballard Mine Upper Elk Pond | 12 | U | 0.35 | | 3.0 | U | 8.4 | | 13 | J | 230 | U | 0.094 | J | 0.0005 | U | 2.1 | UJ | 0.95 | U | 150 | | 7.0 | J | 49 | U |
| SP012 | Ballard Mine Lower Elk Pond | 12 | U | 0.37 | | 3.0 | U | 8.2 | | 42 | J | 230 | U | 0.22 | J | 0.0005 | U | 2.1 | UJ | 0.95 | U | 160 | | 6.5 | J | 49 | U |
| SP014 | Henry Mine Henry Pond | 12 | U | 0.51 | | 3.0 | U | 8.1 | | 430 | J | 230 | U | 0.0042 | J | ND | | 2.1 | U | 0.95 | U | 700 | | 4.0 | U | 49 | U |
| SP015 | Henry Mine Smith Pond | 12 | U | 0.46 | | 3.0 | U | 8.2 | | 500 | J | 250 | | 0.13 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 680 | | 6.0 | J | 49 | U |
| SP016 | Henry Mine Center Henry Pond | 12 | U | 0.15 | | 3.0 | U | 8.0 | | 230 | J | 230 | U | 0.060 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 510 | | 8.5 | J | 49 | U |
| SP017 | Enoch Valley Mine South Pond | 49 | | 0.48 | | 3.0 | U | 7.9 | | 700 | J | 230 | U | 0.22 | J | 0.0005 | U | 2.1 | UJ | 0.95 | U | 1200 | | 5.0 | J | 49 | U |
| SP018 | Enoch Valley Mine Keyhole Pond | 12 | U | 3.8 | | 3.0 | U | 7.7 | | 1500 | J | 230 | U | 0.20 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 2100 | | 4.0 | U | 49 | U |
| SP019 | Enoch Valley Mine Bat Cave Pond | 12 | U | 0.35 | | 3.0 | U | 9.5 | | 220 | J | 230 | U | 0.025 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 430 | | 6.0 | J | 49 | U |
| SP020 | Enoch Valley Mine West Pond | 12 | U | 0.33 | | 3.0 | U | 10.0 | | 280 | J | 230 | U | 0.037 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 280 | | 6.0 | J | 49 | U |
| SP021 | Enoch Valley Mine Stock Pond | 29 | | 0.81 | | 3.0 | U | 8.1 | | 480 | J | 230 | U | 0.11 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 850 | | 4.0 | U | 49 | U |
| SP022 | Enoch Valley Mine Tipple Pond | 140 | | 3.1 | | 3.0 | U | 8.8 | | 320 | J | 230 | U | 0.040 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 710 | | 19 | J | 49 | U |
| SP023 | Enoch Valley Mine Haul Road Pond | 210 | | 2.6 | | 3.0 | U | 8.7 | | 160 | J | 230 | U | 0.024 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 800 | | 10 | J | 49 | U |
| SP025 | Gay Mine W Pit Pond | 17 | | 0.45 | | 3.0 | U | 8.8 | | 150 | J | 230 | U | 0.001 | UJ | 0.0005 | UJ | 2.1 | U | 0.95 | U | 240 | | 36 | J | na | |
| SP026 | Gay Mine Z Pit Pond | 46 | | 0.32 | | 3.0 | U | 8.2 | | 94 | J | 230 | U | 0.0031 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 200 | | 21 | J | na | |
| SP027 | Gay Mine South 40 Pit Pond | 130 | | 0.40 | | 3.0 | U | 8.4 | | 76 | J | 230 | U | 0.033 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 450 | | 15 | J | 49 | U |
| SP030 | Conda Mine Dredge Pond | 12 | U | 0.22 | | 3.0 | U | 9.1 | | 11 | J | 230 | U | 0.0079 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 100 | | 12 | J | 49 | U |
| SP031 | Enoch Valley Mine Shop Pond | 210 | | 0.81 | | 3.0 | U | 8.7 | | 120 | J | 230 | U | 0.0025 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 620 | | 5.0 | J | 49 | U |
| SP032 | Wooley Valley Mine Large Haul Road Pond | 91 | | 0.31 | | 3.0 | U | 8.2 | | 260 | J | 230 | U | 0.0074 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 740 | | 14 | J | na | |
| SP033 | Wooley Valley Mine Upper Angus Creek Reservoir | 12 | U | 0.1 | U | 3.0 | U | 7.9 | | 260 | J | 230 | U | 0.0021 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 600 | | 8.2 | | 49 | U |
| SP034 | Cond Mine Hoorah Hollow Pond | 12 | U | 0.12 | | 3.0 | U | 8.3 | | 19 | J | 230 | U | 0.0014 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 200 | | 4.0 | U | 49 | U |
| SP035 | Conda Mine NL4 Pond | 12 | U | 0.73 | | 3.0 | U | 8.0 | | 210 | J | 230 | U | 0.096 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 370 | | 4.0 | U | 49 | U |
| SP036 | Gay Mine Pond #1 above A-12 Pit | 310 | | 0.44 | | 3.0 | U | 8.1 | | 160 | J | 230 | U | 0.0013 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 1000 | | 9.0 | J | 49 | U |
| SP037 | Gay Mine Pond #2 above A-12 Pit | 290 | | 0.38 | | 3.0 | U | 8.2 | | 210 | J | 230 | U | 0.001 | UJ | 0.0005 | U | 2.1 | U | 0.95 | U | 1000 | | 5.0 | J | 49 | U |
| SP038 | Gay Mine A-12 Lake in A-12 Pit | 260 | | 0.65 | | 3.0 | U | 8.4 | | 250 | J | 230 | U | 0.062 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 920 | | 7.0 | J | 49 | U |
| SP041 | Gay Mine East Limb North Pond | 150 | | 0.1 | U | 3.0 | U | 7.8 | | 87 | J | 230 | U | 0.001 | UJ | 0.0005 | UJ | 2.1 | U | 0.95 | U | 260 | | 41 | J | na | |
| SP044 | North Maybe Mine Pit Pond | 12 | U | 0.88 | | 3.0 | U | 9.1 | | 67 | J | 230 | U | 0.17 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 190 | | 4.0 | U | 49 | U |
| SP045 | Champ Mine Pit Pond | 12 | U | 0.66 | | 3.0 | U | 7.0 | | 440 | J | 230 | U | 0.020 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 820 | | 4.0 | U | 49 | U |
| SP046 | Champ Mine Extension Pit Pond | 12 | U | 0.18 | | 3.0 | U | 7.9 | | 22 | J | 230 | U | 0.010 | J | 0.0005 | U | 2.1 | UJ | 0.95 | U | 89 | | 4.0 | U | 49 | U |
| SP047 | Mountain Fuel Mine North Pit Pond | 12 | U | 0.93 | | 3.0 | U | 8.3 | | 180 | J | 230 | U | 0.011 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 360 | | 5.0 | J | 49 | U |
| SP048 | Mountain Fuel Mine East Limb Pit Pond | 12 | U | 0.62 | | 3.0 | U | 8.1 | | 370 | J | 230 | U | 0.069 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 660 | | 8.0 | J | 49 | U |
| SP050 | Wooley Valley Mine Unit III Pit Pond (South) | 12 | U | 0.21 | | 3.0 | U | 8.2 | | 34 | J | 230 | U | 0.056 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 150 | | 39 | J | 49 | U |
| SP051 | Wooley Valley Mine Unit III Pit Pond (North) | 12 | U | 0.24 | | 3.0 | U | 8.7 | | 25 | J | 230 | U | 0.015 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 99 | | 8.0 | J | 49 | U |
| SP054 | Smoky Canyon Mine A Pit Pond | 23 | | 0.41 | | 3.0 | U | 8.5 | | 60 | J | 230 | U | 0.085 | J | 0.0005 | UJ | 2.1 | U | 0.95 | U | 220 | | 12 | J | 49 | U |
| SP055 | Henry Mine South Pit Pond | 12 | U | 1.0 | | 3.0 | U | 8.0 | | 700 | J | 230 | U | 0.67 | J | 0.0005 | U | 2.1 | U | 0.95 | U | 1200 | | 10 | J | 49 | U |
| SP059 | Ballard Mine Pit #4 Stock Pond | 12 | U | 0.53 | | 3.0 | U | 7.6 | | 13 | J | 230 | U | 0.024 | J | 0.0005 | U | 2.1 | U | 3.3 | | 320 | | 180 | J | 49 | U |
| SP060 | Rasmussen Ridge Mine Unit I Overburden Runoff Pond #4 | 18 | | NA | | 3.0 | U | 7.7 | | 1800 | J | 230 | U | 0.044 | J | 0.0005 | UJ | 2.1 | UJ | 0.95 | U | 2600 | | 300 | J | 49 | U |
| SP061 | Dry Valley Mine Pit B Pond | 12 | U | 0.36 | | 3.0 | U | 8.0 | | 190 | J | 230 | U | 0.16 | J | 0.0005 | UJ | 2.4 | J | 0.95 | U | 460 | | 4.0 | U | 49 | U |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analyses.
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation process.
Data qualifier definitions are:
(U) - The material was analyzed for, but was not detected. The value preceeding the U indicates the value below which results are considered undetected.
(J) - The sample result is an estimated quantity.
(R) - The data are unusable.
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise. The value preceeding the UJ indicates the value below which results are considered undetected.
na: Not available
ND: Not detected

**TABLE 3-2**
**SPRING 2001 AREA-WIDE INVESTIGATION WATER QUALITY PARAMETER RESULTS**

| Station ID | Date | Specific Conductivity (uS/cm) | Dissolved Oxygen (mg/L) | ORP (mV) | pH (s.u.) | Turbidity (NTU) | Temperature (°C) |
|---|---|---|---|---|---|---|---|
| **Stock Ponds** | | | | | | | |
| SP003 | 7/17/01 | 850 | 13 | 220 | 10 | 13 | 19 |
| SP004 | 7/17/01 | 857 | 8.3 | 240 | 8.4 | 2.2 | 18 |
| SP005 | 5/17/01 | 400 | 7.8 | 210 | 8.4 | 4.6 | 13 |
| SP007 | 5/17/01 | 210 | 9.7 | 320 | 8.6 | 4.3 | 13 |
| SP008 | 5/17/01 | 540 | 17 | 180 | 9.4 | n/a | 18 |
| SP009 | 5/17/01 | 189 | 7.7 | 230 | 8.1 | 16 | 17 |
| SP010 | 5/15/01 | 1400 | 7.1 | 210 | 8.4 | 8.6 | 14 |
| SP011 | 5/15/01 | 197 | 7.6 | 180 | 9.2 | 1 | 17 |
| SP012 | 5/15/01 | 240 | 7.3 | 240 | 8.6 | 0.7 | 18 |
| SP014 | 5/15/01 | 890 | 8.1 | 200 | 8.7 | 0.53 | 17 |
| SP015 | 5/15/01 | 860 | 7.7 | 150 | 8.5 | 2.3 | 16 |
| SP017 | 5/14/01 | 1500 | 7.4 | 240 | 8.3 | 11 | 19 |
| SP018 | 5/14/01 | 2200 | 9.1 | 270 | 7.2 | 1.9 | 17 |
| SP019 | 5/14/01 | 600 | 9.3 | 220 | 10 | 1.7 | 16 |
| SP020 | 5/14/01 | 406 | 8.3 | 230 | 11 | 1.6 | 18 |
| SP021 | 5/14/01 | 11 | 8.1 | 250 | 8.4 | 6.4 | 17 |
| SP022 | 5/14/01 | 760 | 7.4 | 240 | 8.7 | 9.9 | 17 |
| SP023 | 5/14/01 | 1000 | 7.5 | 210 | 8.8 | 11 | 19 |
| SP025 | 5/16/01 | 740 | 9.7 | 300 | 9.2 | 13 | 17 |
| SP026 | 5/16/01 | 760 | 8.9 | 270 | 8.6 | 3.8 | 12 |
| SP027 | 5/16/01 | 820 | 10 | 310 | 9 | 11 | 14 |
| SP031 | 5/16/01 | 980 | 12 | 220 | 9.1 | 1.3 | 19 |
| SP032 | 5/18/01 | 1000 | 8.8 | 240 | 6.6 | 6.6 | 16 |
| SP033 | 5/19/01 | 820 | 11 | 310 | 8.2 | 4.2 | 11 |
| SP034 | 5/23/01 | 300 | 14 | 160 | 8.8 | 3.2 | 22 |
| SP035 | 5/23/01 | 570 | 7.7 | -70 | 8.5 | 4 | 20 |
| SP036 | 5/16/01 | 1600 | 8.2 | 280 | 8.1 | 4.1 | 15 |
| SP037 | 5/6/01 | 1600 | 10 | 260 | 8.4 | 2.5 | 13 |
| SP038 | 5/16/01 | 1500 | 6.6 | 270 | 8.4 | 2.5 | 14 |
| SP041 | 5/16/01 | 740 | 9.7 | 300 | 9.2 | 13 | 17 |
| SP044 | 5/18/01 | 280 | 8.2 | 190 | 9.5 | 5 | 13 |
| SP045 | 5/16/01 | 1000 | 7.8 | 220 | 8.4 | n/a | 15 |
| SP046 | 5/16/01 | 181 | 7.8 | 220 | 8.6 | 5.9 | 14 |
| SP047 | 5/18/01 | 510 | 7.9 | 190 | 8.6 | 7.5 | 17 |
| SP048 | 5/17/01 | 780 | 7.9 | 180 | 8.3 | 7.5 | 14 |
| SP050 | 5/21/01 | 177 | 12 | 310 | 9.1 | 53 | 14 |
| SP051 | 5/21/01 | 180 | 8.9 | 230 | 9.2 | 11 | 18 |
| SP055 | 5/14/01 | 1400 | 7.9 | 250 | 8.1 | 7.4 | 17 |
| SP059 | 5/15/01 | 144 | 6.3 | 200 | 8 | 400 | 15 |
| SP060 | 5/18/01 | 2900 | 9.6 | 270 | n/a | 1.8 | 16 |
| SP061 | 5/21/01 | 610 | 9.6 | 200 | 8.5 | 4.1 | 14 |
| SPP16 | 5/15/01 | 720 | 7.9 | 190 | 8.4 | 4.3 | 16 |
| **Dump Seeps** | | | | | | | |
| DS005 | 5/16/01 | 730 | 7.4 | 210 | 7.4 | 1.8 | 7.4 |
| DS006 | 5/16/01 | 1600 | 8.5 | 210 | 8.1 | 1.2 | 18 |
| DS007 | 5/19/01 | 780 | 12 | 180 | 7.8 | 0.55 | 13 |
| DS008 | 5/18/01 | 390 | 17 | 160 | 9.0 | 1.2 | 15.6 |
| DS009 | 5/18/01 | 3000 | 13 | 270 | n/a | 4.7 | 9.1 |
| DS010 | 5/19/01 | 730 | 12 | 210 | 8.1 | 11 | 23.8 |
| DS011 | 5/21/01 | 830 | 6.7 | 200 | 6.9 | 11 | 11.4 |
| DS012 | 5/21/01 | 2100 | 7.5 | 110 | 6.8 | 58 | 13 |
| DS015 | 5/22/01 | 3100 | 9.5 | 230 | 8.2 | 0.83 | 6.3 |
| DS017 | 5/23/01 | 730 | 6.3 | 110 | 7.3 | 1.4 | 10.3 |
| DS018 | 5/22/01 | 2200 | 5.1 | 230 | 8.0 | 3.4 | 16.2 |
| DS019 | 5/23/01 | 2400 | 5.9 | -100 | 7.6 | 33 | 9.8 |
| DS020 | 5/19/01 | 1600 | 8.4 | 180 | 7.3 | 7.2 | 8.3 |
| DS021 | 5/23/01 | 1100 | 7.3 | 150 | 7.7 | 1.2 | 11.8 |
| DS022 | 5/15/01 | 810 | 7.3 | 200 | 7.7 | 24 | 13.6 |
| DS023 | 5/22/01 | 1200 | 11 | 200 | 8.5 | 1.3 | 22.5 |
| DS024 | 5/23/01 | 2900 | 3.3 | -53 | 7.3 | 28 | 6.2 |
| DS025 | 5/15/01 | 1500 | 0.96 | 130 | 6.4 | 6.8 | 8.3 |
| DS026 | 5/14/01 | 1600 | 6.9 | 250 | 7.5 | 5.3 | 11.2 |
| DS027 | 5/15/01 | 780 | 5.6 | 180 | 7.4 | 0 | 8.9 |
| DS028 | 5/22/01 | 1600 | 7.3 | 240 | n/a | 15 | 15.1 |
| DS029 | 5/22/01 | 2000 | 10 | 240 | n/a | 3.6 | 16.9 |

n/a: Not available

**TABLE 3-3**
**SPRING 2001 AREA-WIDE INVESTIGATION SOIL DATA RESULTS**

| Station ID | Facility Name | MWH ID | UI Sample ID | Silver mg/kg | Flag | Arsenic mg/kg | Flag | Barium mg/kg | Flag | Beryllium mg/kg | Flag | Cadmium mg/kg | Flag | Chromium mg/kg | Flag | Copper mg/kg | Flag | Manganese mg/kg | Flag | Lead mg/kg | Flag | Antimony mg/kg | Flag | pH (s.u.) | Flag | Electical Conductivity uS/cm | Flag | Organic Carbon mg/kg | Flag | Sand | Flag | Clay | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WD001-1 | Dry Valley Mine A Dump | 052101SSWD001-1-0 | E0100528 | 11 | J | 41 | | 110 | J | 1.8 | J | 71 | | 980 | J | 160 | J | 25 | J | 9.6 | | 13 | | 5.4 | | 0.21 | | 4.1 | | 32 | | 23 | |
| WD002-1 | Dry Valley Mine North B Dump | 052101SSWD002-1-0 | E0100529 | 5.8 | J | 38 | | 110 | J | 1.2 | J | 26 | | 420 | J | 76 | J | 270 | J | 7.5 | U | 7.5 | U | 7.3 | | 2.1 | | 4.7 | | 25 | | 28 | |
| WD003-1 | Dry Valley Mine South B Dump | 052101SSWD003-1-0 | E0100530 | 4.0 | J | 25 | | 68 | J | 0.97 | J | 26 | | 700 | J | 55 | J | 94 | J | 9.0 | | 8.4 | | 4.6 | | 2.6 | | 2.0 | | 59 | | 11 | |
| WD013-1 | Gay Mine Mill Shale Pile 19 | 051601SSWD013-0-0 | E0100330 | 3.5 | J | 54 | | 76 | J | 1.4 | J | 72 | | 850 | J | 90 | J | 220 | J | 8.1 | | 13 | | 7.6 | | 0.47 | | 2.2 | | 59 | | 13 | |
| WD021-1 | Gay Mine North Limb Dump 25 | 051601SSWD021-0-0 | E0100331 | 2.1 | J | 59 | | 180 | J | 1.5 | J | 47 | | 530 | J | 64 | J | 560 | J | 8.0 | | 9.7 | | 7.3 | | 0.42 | | 0.98 | | 53 | | 15 | |
| WD024-1 | Gay Mine East Limb Main Fill | 051601SSWD024-0-0 | E0100332 | 10 | J | 45 | | 100 | J | 1.4 | J | 99 | | 830 | J | 130 | J | 130 | J | 7.7 | | 13 | | 6.7 | | 0.54 | | 3.6 | | 36 | | 44 | |
| WD044-1 | Georgetown Canyon Mine Dump #1 | 052301SSWD044-1-0 | E0100569 | 2.0 | J | 34 | | 75 | J | 1.2 | J | 70 | | 760 | J | 74 | J | 110 | J | 7.5 | U | 7.6 | | 7.5 | | 0.46 | | 2.9 | | 46 | | 20 | |
| WD045-1 | Georgetown Canyon Mine Dump #2 | 052301SSWD045-1-0 | E0100570 | 6.8 | J | 50 | | 76 | J | 1.6 | J | 67 | | 1200 | J | 120 | J | 67 | J | 7.5 | U | 12 | | 7.3 | | 0.50 | | 6.6 | | 38 | | 27 | |
| WD047-1 | Georgetown Canyon Mine Dump #4 | 052301SSWD047-1-0 | E0100571 | 7.7 | J | 40 | | 71 | J | 1.5 | J | 40 | | 1200 | J | 130 | J | 92 | J | 7.5 | U | 14 | | 7.2 | | 0.92 | | 6.4 | | 38 | | 28 | |
| WD050-1 | Central Farmers Plant Ore Stockpile | 052301SSWD050-1-0 | E0100572 | 6.4 | J | 48 | | 85 | J | 1.7 | J | 78 | | 1100 | J | 120 | J | 140 | J | 7.5 | U | 14 | | 7.3 | | 1.2 | | 4.4 | | 35 | | 27 | |
| WD051-1 | North Maybe Mine Waste Dump | 052301SSWD095-1-0 | E0100575 | 2.0 | J | 41 | | 83 | J | 1.7 | J | 39 | | 1100 | J | 150 | J | 65 | J | 8.1 | | 11 | | 6.0 | | 0.36 | | 11 | | 41 | | 26 | |
| WD051-2 | North Maybe Mine Waste Dump | 052301SSWD098-1-0 | E0100573 | 5.5 | J | 39 | | 78 | J | 1.6 | J | 27 | | 1100 | J | 130 | J | 100 | J | 7.5 | U | 13 | | 6.7 | | 0.45 | | 6.1 | | 27 | | 29 | |
| WD051-3 | North Maybe Mine Waste Dump | 052301SSWD097-1-0 | E0100574 | 9.7 | J | 47 | | 88 | J | 1.8 | J | 44 | | 1300 | J | 130 | J | 130 | J | 8.6 | | 18 | | 7.1 | | 0.69 | | 4.0 | | 18 | | 28 | |
| WD052-6 | Champ Mine Dump | 051701SSWD052-6-0 | E0100481 | 9.1 | J | 31 | | 120 | J | 1.3 | J | 28 | | 350 | J | 90 | J | 36 | J | 7.5 | U | 7.5 | U | 4.7 | | 0.74 | | 3.3 | | 15 | | 19 | |
| WD052-7 | Champ Mine Dump | 051701SSWD052-7-0 | E0100482 | 4.0 | J | 51 | | 76 | J | 1.3 | J | 17 | | 670 | J | 89 | J | 240 | J | 7.5 | U | 9.0 | | 7.2 | | 2.6 | | 7.1 | | 41 | | 19 | |
| WD053-1 | Champ Mine Extension Dump | 051701SSWD053-0-0 | E0100483 | 0.93 | J | 17 | | 62 | J | 0.78 | J | 30 | | 310 | J | 30 | J | 290 | J | 7.5 | U | 7.5 | U | 7.4 | | 0.60 | | 1.1 | | 79 | | 7.8 | |
| WD055-1 | Mountain Fuel Mine Saddle Dump | 051701SSWD055-0-0 | E0100480 | 2.9 | J | 58 | | 110 | J | 1.7 | J | 8.3 | | 1500 | J | 140 | J | 160 | J | 7.5 | U | 22 | | 6.3 | | 0.39 | | 2.6 | | 45 | | 23 | |
| WD056-1 | Mountain Fuel Mine Valley Dump | 051701SSWD056-0-0 | E0100479 | 3.4 | J | 77 | | 100 | J | 1.5 | J | 25 | | 930 | J | 100 | J | 77 | J | 7.5 | U | 14 | | 4.6 | | 2.8 | | 5.9 | | 26 | | 25 | |
| WD057-1 | Mountain Fuel Mine East Limb Dump | 051701SSWD057-0-0 | E0100478 | 2.5 | J | 38 | | 48 | J | 0.77 | J | 49 | | 380 | J | 54 | J | 150 | J | 7.5 | U | 7.5 | U | 7.5 | | 2.6 | | 3.8 | | 46 | | 18 | |
| WD058-1 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-1-0 | E0100484 | 12 | J | 27 | | 70 | J | 1.9 | J | 94 | | 1200 | J | 150 | J | 36 | J | 8.8 | | 15 | | 4.2 | | 2.6 | | 10 | | 40 | | 21 | |
| WD058-2 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-2-0 | E0100485 | 7.1 | J | 26 | | 64 | J | 1.5 | J | 40 | | 810 | J | 120 | J | 42 | J | 7.5 | U | 12 | | 4.8 | | 2.8 | | 5.6 | | 27 | | 24 | |
| WD058-3 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-3-0 | E0100486 | 7.7 | J | 29 | | 89 | J | 1.6 | J | 45 | | 760 | J | 130 | J | 170 | J | 7.5 | U | 10 | | 4.9 | | 1.9 | | 4.7 | | 26 | | 34 | |
| WD059-1 | Wooley Valley Mine Unit I Overburden Dump | 051801SSWD059-0-0 | E0100488 | 4.6 | J | 59 | | 56 | J | 1.2 | J | 69 | | 560 | J | 66 | J | 190 | J | 7.5 | U | 10 | | 7.3 | | 0.29 | | 2.1 | | 53 | | 14 | |
| WD060-1 | Wooley Valley Mine Unit III Overburden Dump | 051801SSWD060-0-0 | E0100487 | 8.9 | J | 39 | | 81 | J | 1.8 | J | 100 | | 980 | J | 100 | J | 27 | J | 7.5 | U | 8.6 | | 5.8 | | 0.34 | | 5.4 | | 59 | | 15 | |
| WD061-1 | Wooley Valley Mine Unit IV Overburden Dump | 051801SSWD061-0-0 | E0100489 | 13 | J | 56 | | 65 | J | 1.3 | J | 62 | | 730 | J | 210 | J | 99 | J | 7.8 | | 12 | | 7.1 | | 0.74 | | 11 | | 43 | | 19 | |
| WD068-1 | Conda Mine West Limb Waste Dump | 052201SSWD068-1-0 | E0100568 | 3.7 | J | 56 | | 79 | J | 1.2 | J | 13 | | 480 | J | 71 | J | 230 | J | 7.5 | U | 7.5 | U | 7.5 | | 0.43 | | 1.7 | | 47 | | 21 | |
| WD069-1 | Conda Mine North Trail Waste Dump | 052201SSWD069-1-0 | E0100567 | 13 | J | 62 | | 130 | J | 1.9 | J | 92 | | 1300 | J | 140 | J | 73 | J | 7.7 | | 19 | | 7.1 | | 0.50 | | 8.8 | | 23 | | 34 | |
| WD072-1 | Conda Mine Woodall Waste Dump | 052201SSWD072-1-0 | E0100566 | 5.6 | J | 41 | | 66 | J | 1.1 | J | 9.9 | | 1100 | J | 83 | J | 170 | J | 9.4 | | 7.5 | U | 7.0 | | 2.9 | | 4.6 | | 28 | | 25 | |
| WD073-1 | Lanes Creek Mine Waste Dump | 052101SSWD073-1-0 | E0100531 | 7.4 | J | 31 | | 51 | J | 1.7 | J | 79 | | 470 | J | 140 | J | 25 | J | 7.5 | U | 15 | | 4.4 | | 1.9 | | 7.8 | | 28 | | 31 | |
| WD073-2 | Lanes Creek Mine Waste Dump | 052101SSWD073-2-0 | E0100532 | 9.4 | J | 42 | | 81 | J | 1.7 | J | 30 | | 1100 | J | 170 | J | 27 | J | 7.5 | U | 19 | | 5.9 | | 0.55 | | 7.3 | | 16 | | 36 | |
| WD073-3 | Lanes Creek Mine Waste Dump | 052101SSWD073-3-0 | E0100533 | 13 | J | 49 | | 97 | J | 1.9 | J | 56 | | 1300 | J | 180 | J | 34 | J | 7.5 | U | 20 | | 6.8 | | 0.23 | | 4.4 | | 21 | | 35 | |
| WD074-6 | Smoky Canyon Mine Waste Dump A1 | 051901SSWD074-6-0 | E0100490 | 6.7 | J | 47 | | 52 | J | 1.5 | J | 79 | | 940 | J | 130 | J | 63 | J | 7.5 | U | 11 | | 4.8 | | 0.28 | | 6.0 | | 39 | | 14 | |
| WD075-6 | Smoky Canyon Mine Pit A Backfill | 051901SSWD075-6-0 | E0100491 | 2.8 | J | 21 | | 28 | J | 0.60 | J | 10 | | 320 | J | 38 | J | 220 | J | 7.5 | U | 7.5 | U | 7.6 | | 0.49 | | 1.4 | | 60 | | 17 | |
| WD076-6 | Smoky Canyon Mine Pole Canyon Waste Dump | 051901SSWD076-6-0 | E0100492 | 6.7 | J | 50 | | 87 | J | 1.5 | J | 42 | | 940 | J | 110 | J | 450 | J | 7.5 | U | 14 | | 7.3 | | 1.3 | | 3.7 | | 33 | | 24 | |
| WD080-6 | Ballard Mine Pit #1 Overburden Dump #1 | 051501SSWD080-6-0 | E0100329 | 9.0 | J | 39 | | 100 | J | 1.7 | J | 120 | | 1100 | J | 150 | J | 100 | J | 10 | | 13 | | 7.2 | | 0.43 | | 5.6 | | 34 | | 23 | |
| WD081-1 | Ballard Mine Pit #1 Overburden Dump #2 | 051501SSWD081-0-0 | E0100328 | 0.53 | J | 22 | | 39 | J | 0.62 | J | 5.8 | | 260 | J | 87 | J | 99 | J | 9.8 | | 7.5 | U | 7.1 | | 0.33 | | 0.98 | | 59 | | 17 | |
| WD085-1 | Henry Mine North Pit Overburden Dump | 051401SSWD085-0-0 | E0100256 | 4.4 | J | 37 | | 94 | J | 1.5 | J | 31 | | 1000 | J | 140 | J | 280 | J | 11 | | 15 | | 6.6 | | 0.17 | | 3.0 | | 22 | | 24 | |
| WD086-1 | Henry Mine Center Pit #1 Overburden Dump | 051401SSWD086-0-0 | E0100255 | 2.0 | J | 50 | | 110 | J | 1.6 | J | 19 | | 1100 | J | 120 | J | 270 | J | 7.5 | U | 17 | | 6.4 | | 0.23 | | 1.9 | | 48 | | 21 | |
| WD090-1 | Henry Mine South Pit Overburden Dump | 051401SSWD090-0-0 | E0100254 | 7.2 | J | 49 | | 75 | J | 1.2 | J | 21 | | 800 | J | 120 | J | 200 | J | 7.5 | U | 12 | | 7.1 | | 0.56 | | 5.7 | | 25 | | 25 | |
| WD091-1 | Enoch Valley Mine Overburden Dump | 051401SSWD091-1-0 | E0100251 | 4.4 | J | 40 | | 170 | J | 1.7 | J | 42 | | 1300 | J | 170 | J | 85 | J | 7.8 | | 23 | | 6.0 | | 0.16 | | 2.6 | | 42 | | 25 | |
| WD091-2 | Enoch Valley Mine Overburden Dump | 051401SSWD091-2-0 | E0100252 | 6.2 | J | 22 | | 110 | J | 2.0 | J | 37 | | 1400 | J | 170 | J | 42 | J | 8.1 | | 14 | | 6.3 | | 0.18 | | 4.0 | | 27 | | 25 | |
| WD092-1 | Enoch Valley Mine Canyon Fill Dump | 051401SSWD092-0-0 | E0100253 | 5.9 | J | 57 | | 75 | J | 1.5 | J | 31 | | 940 | J | 110 | J | 110 | J | 7.5 | U | 16 | | 7.2 | | 0.34 | | 3.8 | | 19 | | 25 | |
| WD093-1 | Ballard Mine Pit #2 Overburden Dump | 051501SSWD093-0-0 | E0100327 | 0.59 | J | 28 | | 91 | J | 1.3 | J | 18 | | 520 | J | 50 | J | 480 | J | 8.0 | | 7.5 | U | 6.6 | | 0.22 | | 1.0 | | 45 | | 18 | |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analyses.
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation process.
Data qualifier definitions are:
(U) - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
(J) - The associated value is an estimated quantity.
(R) - The data are unusable.
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
na: Not Available.
ND: Not Detected.

**TABLE 3-3**
**SPRING 2001 AREA-WIDE INVESTIGATION SOIL DATA RESULTS**

| Station ID | | MWH ID | UI Sample ID | Silt | Flag | > 2 mm | Flag | Texture | Flag | Boron mg/kg | Flag | Fluoride mg/kg | Flag | Mercury mg/kg | Flag | Molybdenum mg/kg | Flag | Nickel mg/kg | Flag | Selenium mg/kg | Flag | Sodium mg/kg | Flag | Thallium mg/kg | Flag | Uranium mg/kg | Flag | Vanadium mg/kg | Flag | Zinc mg/kg | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WD001-1 | Dry Valley Mine A Dump | 052101SSWD001-1-0 | E0100528 | 45 | | 45 | | | | 85 | UJ | 500 | | 0.68 | J | 16 | | 170 | | 17 | J | 1300 | J | 2.0 | UJ | 44 | J | 610 | | 820 | |
| WD002-1 | Dry Valley Mine North B Dump | 052101SSWD002-1-0 | E0100529 | 47 | | 35 | | CL | | 85 | UJ | 960 | | 0.34 | J | 20 | | 240 | | 33 | J | 1400 | J | na | | 32 | J | 230 | | 1300 | |
| WD003-1 | Dry Valley Mine South B Dump | 052101SSWD003-1-0 | E0100530 | 30 | | 53 | | SL | | 85 | UJ | 1200 | | 0.25 | J | 14 | | 320 | | 43 | J | 670 | J | 2.0 | UJ | 28 | J | 160 | | 570 | |
| WD013-1 | Gay Mine Mill Shale Pile 19 | 051601SSWD013-0-0 | E0100330 | 28 | | 34 | | SL | | 85 | UJ | 1100 | | 0.45 | J | 37 | | 260 | | 10 | J | 2200 | J | 2.0 | UJ | 35 | J | 610 | | 1400 | |
| WD021-1 | Gay Mine North Limb Dump 25 | 051601SSWD021-0-0 | E0100331 | 32 | | 30 | | SL | | 85 | UJ | 1100 | | 0.31 | J | 9.8 | | 94 | | 6.1 | J | 1500 | J | 2.0 | UJ | 43 | J | 780 | | 660 | |
| WD024-1 | Gay Mine East Limb Main Fill | 051601SSWD024-0-0 | E0100332 | 20 | | 27 | | L | | 85 | UJ | 300 | | 0.60 | J | 26 | | 270 | | 14 | J | 2000 | J | 2.0 | UJ | 40 | J | 930 | | 1200 | |
| WD044-1 | Georgetown Canyon Mine Dump #1 | 052301SSWD044-1-0 | E0100569 | 33 | | 51 | | L | | 85 | UJ | 250 | | 0.40 | J | 36 | | 230 | | 19 | J | 2200 | J | na | | 53 | J | 820 | | 1400 | |
| WD045-1 | Georgetown Canyon Mine Dump #2 | 052301SSWD045-1-0 | E0100570 | 35 | | 30 | | L | | 85 | UJ | 770 | | 0.59 | J | 29 | | 250 | | 200 | J | 2000 | J | 2.0 | UJ | 51 | J | 970 | | 1100 | |
| WD047-1 | Georgetown Canyon Mine Dump #4 | 052301SSWD047-1-0 | E0100571 | 35 | | 34 | | CL | | 85 | UJ | 590 | | 0.61 | J | 27 | | 260 | | 110 | J | 1400 | J | 2.0 | UJ | 41 | J | 450 | | 1000 | |
| WD050-1 | Central Farmers Plant Ore Stockpile | 052301SSWD050-1-0 | E0100572 | 39 | | 31 | | L | | 85 | UJ | 620 | | 0.62 | J | 35 | | 240 | | 34 | J | 2500 | J | 2.0 | UJ | 59 | J | 900 | | 1100 | |
| WD051-1 | North Maybe Mine Waste Dump | 052301SSWD095-1-0 | E0100575 | 32 | | 53 | | L | | 85 | UJ | 420 | | 1.0 | J | 6.2 | | 200 | | 330 | J | 2100 | J | 2.0 | UJ | 29 | J | 610 | | 590 | |
| WD051-2 | North Maybe Mine Waste Dump | 052301SSWD098-1-0 | E0100573 | 45 | | 45 | | CL | | 85 | UJ | 1100 | | 0.75 | J | 16 | | 300 | | 140 | J | 1900 | J | 2.0 | UJ | 31 | J | 320 | | 1000 | |
| WD051-3 | North Maybe Mine Waste Dump | 052301SSWD097-1-0 | E0100574 | 55 | | 41 | | SiCL | | 85 | UJ | 840 | | 0.72 | J | 27 | | 380 | | 41 | J | 2100 | J | 2.0 | UJ | 38 | J | 480 | | 1500 | |
| WD052-6 | Champ Mine Dump | 051701SSWD052-6-0 | E0100481 | 67 | | 31 | | SiL | | 85 | UJ | 960 | | 0.54 | J | 20 | | 340 | | 33 | J | 1000 | J | 2.0 | UJ | 20 | J | 850 | | 1700 | |
| WD052-7 | Champ Mine Dump | 051701SSWD052-7-0 | E0100482 | 40 | | 42 | | L | | 85 | UJ | 1100 | | 0.46 | J | 39 | | 280 | | 47 | J | 1500 | J | na | | 33 | J | 180 | | 850 | |
| WD053-1 | Champ Mine Extension Dump | 051701SSWD053-0-0 | E0100483 | 13 | | 40 | | LS | | 85 | UJ | 1200 | | 0.18 | J | 5.7 | | 110 | | 9.7 | J | 680 | J | na | | 30 | J | 140 | | 500 | |
| WD055-1 | Mountain Fuel Mine Saddle Dump | 051701SSWD055-0-0 | E0100480 | 32 | | 38 | | L | | 85 | UJ | 770 | | 0.85 | J | 31 | | 380 | | 20 | J | 2300 | J | 2.0 | UJ | 34 | J | 210 | | 1100 | |
| WD056-1 | Mountain Fuel Mine Valley Dump | 051701SSWD056-0-0 | E0100479 | 49 | | 38 | | L | | 85 | UJ | 270 | | 0.56 | J | 37 | | 340 | | 94 | J | 1900 | J | 2.0 | UJ | 36 | J | 500 | | 1400 | |
| WD057-1 | Mountain Fuel Mine East Limb Dump | 051701SSWD057-0-0 | E0100478 | 36 | | 43 | | L | | 85 | UJ | 220 | | 0.26 | J | 31 | | 190 | | 21 | J | 1700 | J | na | | 14 | J | 410 | | 990 | |
| WD058-1 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-1-0 | E0100484 | 39 | | 44 | | L | | 85 | UJ | 630 | | 0.77 | J | 44 | | 220 | | 160 | J | 1500 | J | 2.0 | UJ | 33 | J | 600 | | 1100 | |
| WD058-2 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-2-0 | E0100485 | 49 | | 40 | | L | | 85 | UJ | 860 | | 0.55 | J | 12 | | 190 | | 83 | J | 1300 | J | 2.0 | UJ | 30 | J | 340 | | 760 | |
| WD058-3 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-3-0 | E0100486 | 40 | | 48 | | L | | 85 | UJ | 600 | | 0.46 | J | 18 | | 220 | | 74 | J | 1300 | J | 2.0 | UJ | 33 | J | 340 | | 850 | |
| WD059-1 | Wooley Valley Mine Unit I Overburden Dump | 051801SSWD059-0-0 | E0100488 | 33 | | 39 | | SL | | 85 | UJ | 540 | | 0.42 | J | 17 | | 350 | | 62 | J | 3300 | J | na | | 50 | J | 660 | | 2000 | |
| WD060-1 | Wooley Valley Mine Unit III Overburden Dump | 051801SSWD060-0-0 | E0100487 | 26 | | 50 | | SL | | 85 | UJ | 440 | | 0.54 | J | 7.4 | | 170 | | 120 | J | 2700 | J | 2.0 | UJ | 63 | J | 1200 | | 810 | |
| WD061-1 | Wooley Valley Mine Unit IV Overburden Dump | 051801SSWD061-0-0 | E0100489 | 37 | | 33 | | L | | 85 | UJ | 910 | | 0.85 | J | 45 | | 460 | | 98 | J | 2600 | J | 2.0 | UJ | 62 | J | 350 | | 1700 | |
| WD068-1 | Conda Mine West Limb Waste Dump | 052201SSWD068-1-0 | E0100568 | 32 | | 48 | | L | | 85 | UJ | 850 | | 0.39 | J | 21 | | 180 | | 14 | J | 880 | J | 2.0 | UJ | 16 | J | 200 | | 560 | |
| WD069-1 | Conda Mine North Trail Waste Dump | 052201SSWD069-1-0 | E0100567 | 43 | | 41 | | CL | | 85 | UJ | 930 | | 0.58 | J | 65 | | 350 | | 58 | J | 2300 | J | 2.0 | UJ | 38 | J | 920 | | 1900 | |
| WD072-1 | Conda Mine Woodall Waste Dump | 052201SSWD072-1-0 | E0100566 | 47 | | 51 | | L | | 85 | UJ | 680 | | 0.39 | J | 15 | | 410 | | 34 | J | 1500 | J | na | | 26 | J | 140 | | 1100 | |
| WD073-1 | Lanes Creek Mine Waste Dump | 052101SSWD073-1-0 | E0100531 | 42 | | 38 | | CL | | 85 | UJ | 480 | | 0.78 | J | 8.4 | | 230 | | 1500 | J | 1500 | J | 2.0 | UJ | 20 | J | 620 | | 740 | |
| WD073-2 | Lanes Creek Mine Waste Dump | 052101SSWD073-2-0 | E0100532 | 49 | | 35 | | SiCL | | 85 | UJ | 480 | | 0.93 | J | 12 | | 280 | | 1300 | J | 2300 | J | 2.0 | UJ | 22 | J | 570 | | 1000 | |
| WD073-3 | Lanes Creek Mine Waste Dump | 052101SSWD073-3-0 | E0100533 | 44 | | 44 | | CL, SiCL | | 85 | UJ | 430 | | 0.95 | J | 12 | | 290 | | 130 | J | 2100 | J | 2.0 | UJ | 43 | J | 870 | | 1100 | |
| WD074-6 | Smoky Canyon Mine Waste Dump A1 | 051901SSWD074-6-0 | E0100490 | 47 | | 48 | | L | | 85 | UJ | 290 | | 0.49 | J | 29 | | 190 | | 550 | J | 1800 | J | 2.0 | UJ | 21 | J | 790 | | 810 | |
| WD075-6 | Smoky Canyon Mine Pit A Backfill | 051901SSWD075-6-0 | E0100491 | 23 | | 66 | | SL | | 85 | UJ | 1000 | | 0.22 | J | 13 | | 180 | | 9.7 | J | 700 | J | 2.0 | UJ | 14 | J | 95 | | 410 | |
| WD076-6 | Smoky Canyon Mine Pole Canyon Waste Dump | 051901SSWD076-6-0 | E0100492 | 43 | | 34 | | L | | 85 | UJ | 690 | | 0.53 | J | 26 | | 370 | | 21 | J | 2900 | J | 2.0 | UJ | 39 | J | 470 | | 1400 | |
| WD080-6 | Ballard Mine Pit #1 Overburden Dump #1 | 051501SSWD080-6-0 | E0100329 | 43 | | 26 | | L | | 85 | UJ | 550 | | 0.52 | J | 26 | | 270 | | 83 | J | 1600 | J | 2.0 | UJ | 46 | J | 780 | | 1500 | |
| WD081-1 | Ballard Mine Pit #1 Overburden Dump #2 | 051501SSWD081-0-0 | E0100328 | 24 | | 54 | | SL | | 85 | UJ | 1100 | | 0.21 | J | 15 | | 160 | | 14 | J | 440 | J | 2.0 | UJ | 16 | J | 95 | | 390 | |
| WD085-1 | Henry Mine North Pit Overburden Dump | 051401SSWD085-0-0 | E0100256 | 54 | | 24 | | SiL | | 85 | UJ | 910 | | 0.57 | J | 11 | | 230 | | 34 | J | 1000 | J | 2.0 | UJ | 25 | J | 310 | | 580 | |
| WD086-1 | Henry Mine Center Pit #1 Overburden Dump | 051401SSWD086-0-0 | E0100255 | 31 | | 49 | | L | | 85 | UJ | 810 | | 0.58 | J | 23 | | 330 | | 25 | J | 1600 | J | 2.0 | UJ | 28 | J | 260 | | 1200 | |
| WD090-1 | Henry Mine South Pit Overburden Dump | 051401SSWD090-0-0 | E0100254 | 50 | | 33 | | L | | 85 | UJ | 550 | | 0.69 | J | 39 | | 420 | | 39 | J | 1500 | J | na | | 39 | J | 250 | | 1500 | |
| WD091-1 | Enoch Valley Mine Overburden Dump | 051401SSWD091-1-0 | E0100251 | 33 | | 24 | | L | | 85 | UJ | 1000 | | 0.87 | J | 12 | | 270 | | 35 | J | 1200 | J | 2.0 | UJ | 39 | J | 320 | | 1000 | |
| WD091-2 | Enoch Valley Mine Overburden Dump | 051401SSWD091-2-0 | E0100252 | 48 | | 30 | | L | | 85 | UJ | 1100 | | 0.76 | J | 6.2 | | 120 | | 38 | J | 960 | J | 2.0 | UJ | 42 | J | 510 | | 350 | |
| WD092-1 | Enoch Valley Mine Canyon Fill Dump | 051401SSWD092-0-0 | E0100253 | 57 | | 34 | | SiL | | 85 | UJ | 2300 | | 0.47 | J | 41 | | 400 | | 61 | J | 1300 | J | na | | 27 | J | 410 | | 1700 | |
| WD093-1 | Ballard Mine Pit #2 Overburden Dump | 051501SSWD093-0-0 | E0100327 | 37 | | 39 | | L | | 85 | UJ | 1400 | | 0.27 | J | 14 | | 210 | | 14 | J | 770 | J | 2.0 | UJ | 23 | J | 160 | | 840 | |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analyses.
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation process.
Data qualifier definitions are:
(U) - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
(J) - The associated value is an estimated quantity.
(R) - The data are unusable.
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
na: Not Available.
ND: Not Detected.

# 4.0 REFERENCES


Gilbert, R. O., 1987. *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

Montgomery Watson (MW), 2001. *Spring 2001 Area-Wide Investigation Sampling and Analysis Plan, Southeast Idaho Phosphate Resource Area Selenium Project.* Prepared for the Idaho Mining Association Selenium Committee.

TetraTech EM Inc. (TtEMI), 2001a. *Draft Data Gap Technical Memorandum.* Prepared for the Idaho Department of Environmental Quality.

TetraTech EM Inc. (TtEMI), 2001b. "Technical Note: Seep, Pond, Pit Lake, and French Drain Characterization". Prepared for the Idaho Department of Environmental Quality.

TetraTech EM Inc. (TtEMI), 2001c. "Technical Note: Waste Rock Characterization". Prepared for the Idaho Department of Environmental Quality.

U.S. Environmental Protection Agency (USEPA). 1994. Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA/540/R/94/083. Publication 9240-1-26.

U.S. Environmental Protection Agency (USEPA). 1996. Determination of Detection and Quantitation Levels for Inorganic Analyses. United States Environmental Protection Agency, ICF Technology Inc, ESAT, Region 10. Revision 1.2.

# APPENDICES

# Appendix A
# IDEQ Technical Notes

"Technical Note: Seep, Pond, Pit Lake, and French Drain Characterization"
"Technical Note: Waste Rock Characterization"

# *Technical Note: Seep, Pond, Pit Lake, and French Drain Characterization*

# Technical Note
# Seep, Pond, Pit Lake, and French Drain Characterization

This technical note is intended to provide guidance to the Idaho Mining Association (IMA) on the formulation of a detailed work plan for the sampling and analysis of seeps, ponds, pit lakes, and French drains within the Selenium Project study area. The detailed work plan will be developed by the IMA and submitted to the Idaho Department of Environmental Quality (IDEQ) for review and approval prior to the implementation of critical fieldwork. The recommendations presented herein represent a minimum level of effort to meet area wide risk concerns and the IMA may propose a more extensive program, as appropriate. This area wide characterization of the surface water features may supplement, but does not replace any potential requirements for site-specific characterization of the mines.

## Objective:

The seep, pond, pit lake, and French drain characterization will supplement existing data and provide verification of the range of concentrations for selected constituents within these surface water features. The proposed characterization program emphasizes (1) the inventory of all surface water features in the study area, (2) sampling of all identified surface water features for field water quality analyses, (3) sampling of all ponds and pit lakes identified in the study area for laboratory analyses, (4) resampling of all seeps, ponds, French drains previously sampled in 1998 for evaluation of temporal variations in water quality at these locations, and (5) sampling of the two seeps with the highest observed flows at each mine site. These features represent potential sources of chemical constituents are accessible to uptake by plants and/or animals. The seep sample sites that will be selected for laboratory analysis are broadly dispersed over a large area and are expected to vary temporally in response seasonal and annual climate fluctuations. Thus, the seep water quality assessment effort is not intended to provide a definitive description of the seep water at a particular mine, but rather a representation of the seep water as an area wide source.

The analytical data from this sampling effort will be used primarily to support the establishment of constituents of potential concern (COPC) for human health and ecological risk assessment and development of bounding conditions for the source term of these surface water features.

## Sampling Design:

Initial design work should include an inventory of surface water features associated with each mine listed in Table 1. Individual surface water features and sample locations should be located in a format that is compatible with the Selenium Project GIS standards.

The work plan should include consideration of the following conditions.

1. The surface water features should be identified during an initial field survey (seeps, ponds, French drains, pit lakes). Note, for the purpose of identifying seeps, evidence of previous ponding or seepage (e.g., saturated sediments in low areas at the toes of disposal areas, staining, precipitates on the surface) at locations that may not be flowing at the time of the field survey should be identified as potential seep locations. Identifying potential seeps areas is important because of the below normal winter precipitation.

2. The location of the individual surface water features (both existing and potential) should be surveyed using standard surveying methods or a geographic positioning system. The sites should be identified on representative USGS topographic maps and should be clearly marked in the field to accommodate subsequent agency review or follow-up sampling.

3. Information should be recorded on the characteristics of each surface water feature (e.g., distance of seep from toe of disposal unit, approximate size of surface water body, pond type and condition, observed staining, presence of precipitates on the surface, ultimate discharge point of seep water, etc.).

4. An estimate of the magnitude of flow at each seep should be provided. In addition, the area of ponding or saturation should be estimated.

5. Photographs should be taken at each location.

6. Field water quality measurements should be obtained from the surface water at each location (pH, electrical conductivity, and temperature).

7. Surface water samples should be collected for laboratory analysis from the five waste rock dump seeps, two French drains, and nine ponds sampled as part of the 1998 regional investigation. This will allow for the evaluation of temporal variations of surface water quality at these locations.

8. Water samples should be collected from each pond and pit lake identified within the mine lease areas.

9. Surface water samples should be collected from the two seeps that have the highest estimated flow rate at each mine. The samples should be collected as close to the disposal area as possible (i.e., at the point the seep first appears).

10. All samples designated for laboratory water quality analysis will be collected in containers supplied by the analytical laboratory and analyzed for the parameters listed in Table 2.

11. A follow-up field survey should be conducted in mid-summer to evaluate the persistence of the individual seeps identified during the peak runoff season. Field water quality measurements should be obtained from the surface water features

during the follow-up summer survey (i.e., pH, electrical conductivity, and temperature).

**Number of Samples:**

All ponds and pit lakes identified at the individual mine sites listed in Table 1 will be sampled. Additionally, two seeps with the highest flow at each mine site will be sampled, and the five waste rock dump seeps, two French drains, and nine ponds sampled as part of the 1998 regional investigation will be sampled. Field water quality samples will be collected from all identified surface water features. Additional samples may be collected at the discretion of the field sampling team.

**Schedule:**

A timeline should be provided for fieldwork, lab analysis, preliminary data delivery, and reporting. Field activities should begin no later than Monday, May 14, 2001. Final data packages and deliverables are due by Monday, July 16, 2001. Interim data reports will be provided by e-mail, upon receipt of laboratory analysis results, to allow for review and consideration in planning summer work activities. The IDEQ RPM will be kept informed of any field schedule modifications or changes in projected sampling team locations to allow for appropriate QA inspections by the Agency. The IDEQ will accompany the IMA sampling team at the initial sites to clarify procedural aspects of the work.

**Data Presentation:**

Official laboratory reports and QA/QC data should be supplied in electronic and hard copy formats. Raw laboratory data reported below the detection limit may be submitted if the reports are accompanied by clearly identified method detection limits (MDL). Complete EPA data validation is not required for the preliminary submittal of the laboratory data, but must be conducted on the dataset and submitted with the final report.

**Table 1. Area Wide Mines Included in Spring 2001 Surface Water Characterization**

| Area Wide Mines | |
|---|---|
| Dry Valley | Champ |
| Gay | North Maybe Canyon |
| Smoky Canyon | Georgetown Canyon |
| Lanes Creek | Enoch Valley |
| Conda | Henry |
| Rasmussen Ridge | Ballard |
| Mountain Fuel | Wooley Valley |

## Table 2. Analytes and Methods for Mine Surface Water Facilities (Spring 2001)

| Parameter | Method | Parameter | Method |
|---|---|---|---|
| Aluminum | 200.8 | Fluoride | 300.0 |
| Antimony | 200.8 | Alkalinity | 310.1 |
| Arsenic | 200.8 | Calcium | 200.7 |
| Barium | 200.7 | Carbonates | 310.1 |
| Beryllium | 200.7 | Chloride | 300.0 |
| Boron | 200.7 | Hydroxide | 310.1 |
| Cadmium | 200.8 | Iron | 200.7 |
| Chromium | 200.8 | Magnesium | 200.7 |
| Copper | 200.8 | Nitrate–N | 300.0 |
| Lead | 200.8 | Potassium | 200.7 |
| Manganese | 200.7 | Settleable Solids | 160.5 |
| Mercury | 245.1 | Sulfate | 300.0 |
| Molybdenum | 200.8 | Sodium | 200.7 |
| Nickel | 200.8 | TOC | SM5310B |
| Selenium | ICP-HG | TSS | 160.2 |
| Silver | 200.8 | TDS | 160.1 |
| Thallium | 200.8 | Hardness | Calculated |
| Uranium | 200.8 | Phosphorus | 300.0 |
| Vanadium | 200.8 | pH | 310.1 |
| Zinc | 200.7 | | |

# *Technical Note: Waste Rock Characterization*

# Technical Note
# Waste Rock Characterization

This technical note is intended to provide guidance to the Idaho Mining Association (IMA) on the formulation of a detailed work plan for the sampling and analysis of waste rock within the Selenium Project study area. The detailed work plan will be developed by the IMA and submitted to the Idaho Department of Environmental Quality (IDEQ) for review and approval prior to the implementation of critical fieldwork. The recommendations presented herein represent a minimum level of effort to meet area wide risk concerns and the IMA may propose a more extensive program, as appropriate. This area wide waste rock characterization may supplement, but does not replace any potential requirements for site-specific characterization of the mines.

## Objective:

The waste rock characterization will supplement existing data and provide verification of the range of concentrations for selected constituents. The proposed sampling emphasizes materials that occur at the surface of the waste dumps and are accessible for uptake by plants and animals. The sample sites are broadly dispersed over a large area that contains millions of tons of waste rock. Thus, this effort is not intended to provide a definitive description of the waste rock dumps at a particular mine, but rather a representation of the waste rock as an area wide source.

The analytical data from this sampling effort will be used primarily to support the establishment of constituents of potential concern (COPC) for human health and ecological risk assessment and development of bounding conditions for the waste rock source term.

## Sampling Design:

A directed (judgment) sampling approach is considered appropriate for the waste rock characterization because simple random sampling is not considered to be cost-effective or practical given the time constraints associated with the 2001 sampling efforts. This sampling approach is further justified by the projected requirement for intensive site-specific studies. Because the sampling is selective, individuals that are knowledgeable of the area should make the site selection. This sampling design is expected to support confirmation of the presence of targeted analytes and development of means and ranges of selected constituents. Initial design work should include an inventory of waste rock dumps associated with each mine. Waste rock dumps and sample locations should be located using a GIS format that is compatible with the Selenium Project GIS standards.

The work plan should include consideration of the following conditions.

1) Waste dump with surface exposures of the waste zone (middle, lower or upper) materials from the Mead Peak Phosphatic Shale Member of the Phosphoria Formation should be selected for sampling. The waste zone shales are thought to

represent the most deleterious facies of the Phosphoria Formation, at least with respect to selenium concentrations. Areas that are known to be composed of pre-strip overburden, chert, or salvaged soils should be avoided, however, these areas should be noted if they are extensive and comprise a significant portion the surface of the waste dumps. The IMA may elect to collect samples of these materials for characterization, but these samples should not be considered to meet the minimum sampling requirement for the mine.

2) The oldest exposed surfaces on the waste dumps should be selected to account for weathering influences. The age of the dump should be estimated and the source of the estimate provided (e.g., mine staff, air photos, production and haul records). For sites with multiple waste dumps, the sample should be collected from different dumps.

3) Where possible, the sampling sites should be on vegetated, low-gradient areas and in well-drained (convex) landscape positions to avoid potential influences associated with run-on.

4) Soil samples will be collected from shallow pits excavated to a depth of at least 12 inches. Depth weighted samples should be collected to represent the surface foot of stockpile.

5) Soil color, effervescence, and volumetric rock fragment content will be described in the field using standard methods (Soil Survey Division Staff, 1993). The quantity, size, and distribution of plant roots should be noted.

6) Sample size should be about 3 quarts of fine earth fraction (< 2 mm). Rock fragments (gravel and cobble) can be removed in the field to reduce sample bulk, but the volume of rock fragment should be noted. This sample size should ensure that enough material is available for archiving if additional analyses are required. Provisions for secure storage should be made to accommodate potential follow-up analyses.

7) The proposed analytes and methods are listed in Table 2.

8) Sample locations should be surveyed using standard surveying methods or a geographic positioning system. The sample sites should be clearly marked in the field to accommodate subsequent agency review or follow-up vegetation sampling.

**Number of Samples:**

A minimum of 3 samples should be collected from each of the 14 area-wide mines listed in Table 1. Additional samples may be collected at the discretion of the field sampling team.

## Schedule:

A timeline should be provided for fieldwork, lab analysis, preliminary data delivery, and reporting. Field activities should begin no later than Monday, May 14, 2001. Final data packages and deliverables are due by Monday, July 16, 2001. Interim data reports will be provided by e-mail, upon receipt of laboratory analysis results, to allow for review and consideration in planning summer work activities. The IDEQ RPM will be kept informed of any field schedule modifications or changes in projected sampling team locations to allow for appropriate QA inspections by the Agency. The IDEQ will accompany the sampling team at the initial sites to clarify procedural aspects of the work with subsequent review as necessary.

## Data Presentation

Official laboratory reports and QA/QC data should be supplied in electronic and hard copy formats. Raw laboratory data reported below the detection limit may be submitted if the reports are accompanied by clearly identified method detection limits (MDL). Complete EPA validation is not required for the preliminary submittal of the laboratory data, but must be conducted on the dataset and submitted with the final report. No MDL is required for pH, EC, Organic Carbon, or Particle Size Distribution.

**Table 1. Area Wide Mines Included in Spring 2001 Waste Rock Characterization**

| Area Wide Mines | |
|---|---|
| Dry Valley | Champ |
| Gay | North Maybe Canyon |
| Smoky Canyon | Georgetown Canyon |
| Lanes Creek | Enoch Valley |
| Conda | Henry |
| Rasmussen Ridge | Ballard |
| Mountain Fuel | Wooley Valley |

**Table 2. Analytes and Methods for Waste Rock Characterization**

| Parameter | Soil |
|---|---|
| Antimony | 3050B/6010B |
| Arsenic | 3050B/6010B |
| Barium | 3050B/6010B |
| Beryllium | 3050B/6010B |
| Boron | 3050B/6010B |
| Cadmium | 3050B/6010B |
| Chromium | 3050B/6010B |
| Copper | 3050B/6010B |
| Lead | 3050B/6010B |
| Manganese | 3050B/6010B |
| Mercury | 3050B/6010B |
| Molybdenum | 3050B/6010B |
| Nickel | 3050B/6010B |
| Selenium | (UI Procedure) ICP-HG |
| Silver | 3050B/6010B |
| Thallium | 3050B/6010B |
| Uranium | 3050B/6010B |
| Vanadium | 3050B/6010B |
| Zinc | 3050B/6010B |
| Fluoride | 3050B/6010B |
| pH | USDA # 60-21a |
| Extract Electrical Conductivity | USDA # 60-2 & 4 |
| Organic Carbon Content | USDA # 60-24 |
| Particle Size Distribution | Agronomy 9: 15-4.2.2 |

## References:

Agronomy. 1986. Methods of soil analysis- physical and mineralogical methods. Book Series No. 9. Part 1. 2nd edition. American Society of Agronomy, Madison, WI.

Soil Salinity Laboratory Staff. 1954. Diagnosis and improvement of saline and alkali soils. Agricultural Handbook No. 60. USDA Agricultural Research Service. U.S. Government Printing Office, Washington, D.C.

Soil Survey Division Staff. 1993. Soil Survey Manual. Agricultural Handbook No. 18. USDA Soil Conservation Service. U.S. Government Printing Office, Washington, D.C.

# Appendix B
# Surface Water Data Validation Summary

# APPENDIX B

# SPRING 2001 IDAHO MINING ASSOCIATION AREA-WIDE INVESTIGATION SURFACE WATER DATA VALIDATION AND QUALITY CONTROL SUMMARY REPORT

The following is a summary of the data validation and quality control (QC) review conducted for the Spring 2001 Area-Wide Investigation sampling effort. This effort was completed on the behalf of the Idaho Mining Association (IMA). The University of Idaho (UI) Analytical Sciences Laboratory was the primary analytical laboratory performing the analyses. The Applied Physics & Chemistry (APC) Laboratory located in Chino, CA was the quality assurance (QA) laboratory tasked with analyzing surface water samples collected at QA sampling locations. APC also performed total organic carbon (TOC) analysis on all samples. Both laboratories were selected prior to sampling, and both were proficient in the analysis of metals and other parameters as requested by the Idaho Department of Environmental Quality (IDEQ). Data analyzed by the University of Idaho and APC were subjected to validation procedures outlined by the Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses (EPA, December 1994).

Sixty-six total surface water samples were collected, which included seven randomly selected samples collected with additional volume for QA/QC analysis, seven field equipment blanks and seven field DI-water samples. Samples were submitted under chain-of-custody to the University

of Idaho and APC analytical laboratories. The UI laboratory analyzed the samples for the following:

- EPA 160 (TDS, TSS)
- EPA 200.7 (B, Ba, Be, Ca, Fe, K, Mg, Mn, Na, Zn)
- EPA 200.8 (Al, Sb, As, Cd, Cr, Cu, Pb, Mo, Ni, Ag, Tl, U, V)
- EPA 245.7 (Hg)
- EPA 300 (Chloride, Fluoride, Sulfate)
- EPA 310 (pH, Total Alkalinity, Carbonate Alkalinity, Bicarbonate Alkalinity)
- EPA 353.2 (Nitrate-N + Nitrite-N)
- EPA 365.4 (Phosphorous)
- ICP Hydride (Se)

The APC laboratory analyzed the samples for the following:

- EPA 160 (TDS, TSS)
- EPA 212.3 (B)
- EPA 300 (Chloride, Fluoride, Sulfate)
- EPA 310.1 (Alkalinity)
- EPA 353.3 (Nitrate)
- EPA 354.1 (Nitrite)
- EPA 365.2 (Carbonate, Bicarbonate, Phosphorous)
- EPA 415.1 (TOC)
- SW7470A (Hg)

- SW6010B (Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Tl, V, Zn)

Data quality objectives (DQOs) are qualitative and quantitative statements that specify the quality of these data required to meet the goals of site investigation and/or to support decisions made in environmental management activities. DQOs for the Spring 2001 Area-Wide Investigation were expressed in terms of precision, accuracy, representativeness, completeness, and comparability (PARCC). The results of QC samples were evaluated against the DQOs and the quality of the data was assessed according to the PARCC parameters. QC sample results that fall outside these criteria serve to signal unacceptable or biased data that could result in corrective actions being implemented, or qualification of the data. The following is a summary review of these data, including data qualification that resulted from the data validation.

**Precision and Accuracy**

Precision and accuracy were evaluated based on the QC results generated from calibrations, spiked samples, laboratory duplicates, laboratory control samples and serial dilutions.

All UI calibrations were acceptable except selenium. UI selenium results were qualified as estimated (J), according to the criteria. All APC calibrations were acceptable.

All UI spike recoveries were acceptable except selenium, sulfate and nitrate-nitrite. UI analyte data with unacceptable spike recoveries were qualified as estimated (J, UJ), according to the criteria. Spike analyses performed by UI include Laboratory blank spikes (for Cd, Cl, F, Hg, nitrate-nitrite, Se, sulfate, total phosphorus) and matrix spikes (for Cd, F, Hg, Se, nitrate-nitrite,

sulfate, total phosphorus). All APC spike recoveries were acceptable except aluminum, calcium, iron, magnesium, sodium and selenium. APC analyte data with unacceptable spike recoveries were qualified as estimated (J, UJ), according to the criteria. Spike analyses performed by APC include Laboratory Control Spike, Laboratory Control Spike Duplicate (for method SW6010B, SW7470A, EPA 160, EPA 212.3, EPA 300, EPA 310.1, EPA 353.3, EPA 354.1, EPA 365.2). Also, Matrix Spike (for method SW6010B, SW7470A, EPA 212.3, EPA 300, EPA 354.1) and Post Digest Spike Sample Recovery (for method SW6010B, EPA 212.3).

All UI laboratory duplicates were acceptable except aluminum and total suspended solids. UI analyte data with unacceptable duplicate performance were qualified as estimated (J), according to the criteria. All APC laboratory duplicates were acceptable.

Laboratory control samples or standard reference materials (SRM) were analyzed with the samples. UI analyzed all SRMs with acceptable results except aluminum, barium, molybdenum, selenium, sodium, vanadium and zinc. UI data that did not have acceptable SRM results for each analyte were qualified as estimated (J, UJ) according to the criteria. UI analyzed SRMs identified as APG4073 (for Al, As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, Se, Ag, Tl, V, Zn), APG4052 (for Ca, Mg, K, Na), APG7878 (for Sb, B, Hg, Mo), APG3437 (for Cl, F, $SO_4$), APG3439 (for pH, carbonate, bicarbonate, alkalinity), APG3 (for phosphorous), Demand 99101 (for nitrate-nitrite) and House Reference Water (for Ba, Be, Fe, Mn, Zn, Ca, Mg, K, Na). APC did not analyze laboratory control samples or standard reference material.

UI did not perform serial dilutions. All serial dilutions performed by APC were acceptable except selenium. APC analyte data with unacceptable serial dilution performance were qualified as estimated (J), according to the criteria.

**Representativeness**

Representativeness was evaluated through the analysis of laboratory method blanks and equipment blanks. The evaluation of blanks is evaluated before and during the analytical process. Individual UI results were qualified as undetected (U) for aluminum, barium, cadmium, copper,calcium, chloride, chromium, magnesium, nickel, lead, phosphorous, potassium, silver, sodium, uranium, vanadium, bicarbonate alkalinity, total alkalinity and nitrate-nitrite, according to the criteria. Individual APC results were qualified as undetected (U) for arsenic, lead, silver and TOC, according to the criteria.

**Completeness**

Field QC samples were collected and analyzed, and laboratory QC samples were analyzed as specified in the Spring 2001 Area-Wide Investigation Sampling and Analysis Plan (MWH, 2001). UI field data was complete. APC field data was not complete, three samples collected for TOC analysis were broken during shipment. APC QC data was complete, except APC did not analyze for uranium and six samples were not analyzed for calcium or cobalt.

Both laboratories provided raw data packets that contained information on the specific analytes to which surface water samples were subjected. Field QA/QC samples were collected and analyzed by the UI and APC as required. Analytical data were discoverable in raw data packets

from the UI and APC. All sample analytical holding times except mercury (UI) were met within acceptable limits. Blank spike and matrix spike amounts were written on various QC sheets.

**Comparability**

Comparability was achieved by UI and APC analyzing the samples according to the required methods. Each laboratory used acceptable methodology, which is recognized by the EPA in analyzing samples. Detection limits were reported by each laboratory for each specific analyte and included in either the raw data packet or electronic files.

**Summary of Data Quality**

The evaluation of the PARCC criteria provided information on the quality of the data. The data were considered usable as a result of the validation.

**References**

EPA 1994. "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses." Publication 9240.1-26, EPA/540/R/94/083, PB95-963525. Office of Solid Waste and Emergency Response, USEPA, Washington, D.C.

Montgomery Watson Harza 2001. "Sampling and Analysis Plan – Southeast Idaho Phosphate Resource Area Selenium Project, Spring 2001 Area – Wide Investigation." April 2001.

# INORGANIC DATA ASSESSMENT SUMMARY

| | |
|---|---|
| PROJECT: IMA Selenium Project | SITE: Southeast Idaho |
| LABORATORY:<br>Primary Laboratory: U of I- Holm Research Center<br>QA Laboratory: APCL | SDG: |
| SAMPLES/MATRIX/ANALYSES: | |
| • Spring 2001 | |
| • Matrix: Surface Water | |
| • Methods: EPA 160.1, EPA 160.2, EPA 200.7, EPA 200.8, EPA 212.3, EPA 245.7, EPA 300.0, | |
| EPA 310.1, EPA 353.2, EPA 353.3, EPA 354.1, EPA 365.2, EPA 365.4, EPA 415.1, SW6010B, | |
| SW7074A and ICP Hydride | |
| • Analyses: Total Organic Carbon, Total Dissolved Solids, Total Suspended Solids, Chloride, | |
| Nitrate, Nitrite, Phosphorous, Ag, Al, As, B, Ba, Be, Ca, Cd, Cr, Cu, Fe, Hg, K, Mg, | |
| Mn, Mo, Na, Ni, Pb, Sb, Se, Tl, U, V, Zn, Fluoride, Sulfate, Alkalinity, Carbonate, | |
| Bicarbonate | |

# DATA ASSESSMENT SUMMARY

| REVIEW ITEM | ICP | AA | HG | CYANIDE | OTHER |
|---|---|---|---|---|---|
| 1. Data completeness | O | | O | | O |
| 2. Holding Times | O | | O | | O |
| 3. Calibration | O | | O | | O |
| 4. Blanks | O | | O | | O |
| 5. ICS | O | | O | | O |
| 6. LCS | O | | O | | O |
| 7. Duplicate RPD | O | | O | | O |
| 8. Spike Recovery | O | | O | | O |
| 9. MSA | NA | | NA | | NA |
| 10. Other QC | O | | O | | O |
| 11. Field Duplicates | O | | O | | O |
| 12. Result Verification | O | | O | | O |
| 13. Overall Assessment | O | | O | | O |

O=Data had no problems/or qualified due to minor problems.
M=Data qualified due to major problems.
NA=Data review item not applicable.
X=Problems but do not affect data.
Z=Data unacceptable.

Comments/Qualified Results:

- This data validation summary summarizes all individual analyte data assessments for Spring 2001 Surface Water data. See individual sections below for a summary of the results from the individual analyte data assessments. All data were acceptable with some qualifications.

Verified and Validated by: _____ Date: 21 FEB 02

Reviewed and Approved by: _____ Date: 2/22/02

# INORGANIC DATA ASSESSMENT SUMMARY

| | Acceptable Yes | No |
|---|---|---|
| 1. Data package completeness (check if present) | _X_ | ___ |

_X_Case narrative
_X_Chain of custody
_X_Sample Results
_X_ICV/CCV Results
_X_Blank Results
_X_ICP Interference Check Results
_X_Spike Recovery Results
_X_Duplicate Results
_X_LCS Results
___Standard Addition Results
_X_ICP Serial Dilution
_X_Instrument Det. Limits
___ICP Correction Factors
___ICP Linear Ranges
_X_Preparation Logs
_X_Analysis Run Logs
_X_ICP Raw Data
___GFAA Raw Data
___Hg Raw Data
___Cyanide Raw Data
___Other_____

Comments/Qualified Results:

- Case narrative present for APCL data only.
- ICP interference checks completed on APCL analyses only.
- ICP serial dilution performed by APCL only.
- APCL analyzed only one of seven QA samples for calcium.

| | | |
|---|---|---|
| 2. Holding times (check all that apply) | _X_ | ___ |

_X_ICP/GFAA metals completed in <6 mos from collection
___Mercury analyzed in <28 days from collection
___Cyanide completed in 14 days from collection

Qualify as estimated (J, UJ) all results analyzed past the holding times listed but within 2x times the limit. Qualify detects as estimated (J) and non-detects unusable (UR) for results analyzed greater than 2x above the limit. If soil data are qualified based on water holding time criteria, note.

Comments/Qualified Results:

- APCL- All samples were analyzed within acceptable holding times.
- UI- All samples except mercury were analyzed within acceptable holding times.

| | Acceptable Yes | No |
|---|---|---|
| 3. Calibrations (check all that apply) | _X_ | ___ |

___GFAA/Hg correlation coefficient <0.995, results estimated (J, UJ)
_X_ICV/CCV %R, ICP 89-111%, Hg 80-120%, Cn 85-115%, results acceptable
___ICV/CCV %R, ICP 75-89%, Hg 65-79%, Cn 70-84%m results <IDL estimated (UJ)
___ICV/CCV %R, ICP <75%, Hg <65%, Cn <70%, results unusable (R)
___ICV/CCV %R, ICP >125%, Hg >135%, Cn >130%, results >IDL unusable (R), <IDL acceptable
_X_ICV/CCV %R, ICP 75-89% or 111-125%, Hg 65-79% or 121-135%, Cn 70-84% or 116-130%, results >IDL estimated (J)

Comments/Qualified Results:

- APCL- All calibrations were acceptable.
- UI – Selenium data flagged as estimated (J) due to a check standard percent recovery (120 %R) being outside of acceptable range. All other UI calibrations were acceptable.

| | | |
|---|---|---|
| 4. Blanks (check all that apply) | _X_ | ___ |

_X_Detects reported ICB/CCB, list:

- APCL- Laboratory blank detection: Arsenic (2.2 ug/L), Silver (0.55 ug/L), Lead (0.99 ug/L)
- UI- Laboratory blank detection: Chromium (1.6 ug/L), Uranium (1.6 ug/L), Chloride (2.4 mg/L)

___Detects in preparation blanks, list:

_X_Detects in field blanks, list:

- APCL- Equipment blank detection: TOC (9.7 mg/L)
- UI- Equipment blank detection: Nickel (0.66 ug/L), Aluminum (6.7 ug/L)
- UI- Field DI-water sample detection: Calcium (9.2 mg/L), Silver (0.41 ug/L), Sodium (4.4 mg/L), Barium (0.013 mg/L), Cadmium (0.14 ug/L), Copper (0.23 ug/L), Lead (0.54 ug/L), Magnesium (4.1 mg/L), Potassium (1.9 mg/L), Vanadium (1.9 ug/L), Total Phosphorous (0.19 mg/L), Bicarbonate Alkalinity (45 mg/L), Total Alkalinity (45 mg/L), Nitrate-Nitrite (0.41 mg/L)

Qualify as undetected (U) all sample concentrations $\leq$5X any blank concentrations.

Comments/Qualified Results:

- Not all of the blank detections are listed above. The highest blank detections of the three types of blanks that were used to qualify the data are listed above.
- APCL- analyte results corresponding to the above blank detections were qualified as undetected (U) for all sample concentrations $\leq$5X the corresponding blank concentration listed above.
- UI- analyte results corresponding to the above blank detections were qualified as undetected (U) for all sample concentrations $\leq$5X the corresponding blank concentration listed above.

| | Acceptable Yes | No |
|---|---|---|
| 5. Interference Checks (check all that apply) | _X_ | ___ |

_X_ICS A/B Recoveries Acceptable
___Al, Ca, Fe, Mg sample concentrations >ICS concentrations
___ICS %R> 120%, results > IDL estimated (J)
___ICS %R 50-79%, results>IDL estimated (J), possible false negative
___ICS %R 50-79%, results <IDL estimated (UJ)
___ICS %R <50%, results >IDL and <IDL rejected (R/UR)
___ICS %R>120, results <IDL acceptable

Comments/Qualified Results:

- APCL- ICP interference check samples for method SW6010B were acceptable.
- UI- no ICP interference check samples were analyzed.

| | | |
|---|---|---|
| 6. Laboratory Control Samples (check all that apply) | _X_ | ___ |

_X_LCS %R 80-120 (Ag, Sb no limits)
_X_LCS %R 50-79% or >120%, results>IDL estimated (J)
_X_LCS %R 50-79% and results <IDL estimated (UJ)
___ LCS %R <50% and all results rejected (R/UR)
_X_LCS %R >120%, results <IDL acceptable

Comments/Qualified Results:

- APCL – laboratory control samples were not analyzed. Laboratory control spikes were included in section "8. Spike Recovery".
- UI- barium, molybdenum, selenium, sodium and vanadium were qualified as estimated (J) for sample concentrations >IDL and estimated (UJ) for sample concentrations <IDL.
- UI- aluminum and zinc were qualified as estimated (J) for sample concentrations >IDL.

| | | |
|---|---|---|
| 7. Duplicate (check all that apply) | _X_ | ___ |

_X_Duplicate RPD $\leq$20% for waters ($\leq$35% for soils) for results >5X CRDL
_X_Duplicate Range is within $\pm$CRDL ($\pm$2xCRDL for soils) for results $\leq$ 5X CRDL
_X_Qualify positive results estimated (J) if the above criteria were not met.

Comments/Qualified Results:

- APCL- duplicates were performed on laboratory control spikes. All duplicates were acceptable.
- UI- Total suspended solids (TSS) and aluminum results were qualified as estimated (J) for all sample concentrations >IDL.

| | Acceptable Yes | No |
|---|---|---|
| 8. Spike Recovery (check all that apply) | _X_ | ___ |

_X_Spike %R with 75-125%
_X_Spike %R 30-74%, >125%, results >IDL estimated (J)
_X_Spike %R 30-74% results <IDL estimated (UJ)
___Spike %R <30%, results <IDL rejected (UR)
___Field blank used for spike analysis
_X_Spike % R >125%, results <IDL acceptable
___Sample concentration exceeds spike concentration by a factor of >4x, acceptable

Comments/Qualified Results:

- APCL- magnesium, selenium and sodium sample concentrations >RL were qualified as estimated (J) and sample concentrations <RL were qualified as estimated (UJ). Aluminum, calcium and iron sample concentrations >RL were qualified as estimated (J).
- UI- nitrate-nitrite and sulfate sample concentrations >EDL were qualified as estimated (J). Selenium sample concentrations >EDL were qualified as estimated (J) and sample concentrations <EDL were qualified as estimated (UJ).

| | | |
|---|---|---|
| 9. GFAA Performance (check all that apply) | _X_ | ___ |

___Duplicate injection RSD<20%
___Duplicate injection RSD>20%, results >CRDL estimated (J)
___Analytical spike %R 85-115%
___Analytical spike %R 40-85%, results >IDL estimated (J)
___Analytical spike %R 10-40%, results <IDL estimated (UJ)
___Analytical spike %R <10%, results <IDL rejected (R)
___Analytical spike %R <40%, results >IDL estimated (J)
___MSA required but not run, results estimated (J)
___MSA run at incorrect level, results estimated (J)
___MSA correlation coefficient <0.995, results estimated (J)

Comments/Qualified Results:

- APCL – not analyzed.
- UI – not analyzed.

| | | |
|---|---|---|
| 10. Serial Dilution (check all that apply) | _X_ | ___ |

_X_Serial Dilution %D within 10% for sample results >50x the IDL
_X_Serial Dilution %D greater than 10%, results >50x the IDL estimated (J)

Comments/Qualified Results:

- APCL –selenium sample results >50x the respective RL were qualified as estimated (J).
- UI- serial dilution analyses were not performed.

| | Acceptable Yes | No |
|---|---|---|
| 11. Field Duplicates (check all that apply) | _X_ | ___ |

___Field duplicate RPD ≤20% waters (≤35% for soils)
___Field duplicate range is within ±CRDL (±2x CRDL for soils) for results <5xCRDL

Note: There are no qualification requirements for field QC samples exceeding limits.

Comments/Qualified Results:

- APCL- no field duplicates collected.
- UI- QA/QC samples collected in triplicate. No qualification requirements.

| | | |
|---|---|---|
| 12. Result Verification (check all that apply) | _X_ | ___ |

_X_All results supported in raw data

Comments/Qualified Results:

- APCL- all results below the method detection limit were reported as not detected. Not detected results were reported as less than the respective reporting limit in the hard copy analytical report and as zero (0 ug/L) in the electronic data analytical report. Data not checked 100%, but no transcription errors/anomalies were noted on items checked.
- UI- all results below the respective detection limit were reported as BDL (below detection limit). Data not checked 100%, but no transcription errors/anomalies were noted on items checked.

| | | |
|---|---|---|
| 13. Overall Assessment | _X_ | ___ |

- APCL and UI data were acceptable. Data were qualified (flagged) as estimated (UJ, J) and undetected (U) for various reasons. Discussion is included in the above sections, as well as in the data assessment summary for each analyte from UI and APCL.
- Sample results <RL (APCL) or <EDL (UI) were qualified as U for the following analytes:

  APCL
  Chloride, Fluoride, Nitrate, Nitrite, Carbonate, Phosphorus, Ag, Al, Ba, Be, Cd, Co, Cr, Cu, Tl, Sb, V, Zn

  UI
  As, B, Be, Fe, Hg, Mn, Mo, Sb, Se, Tl, Zn, Fluoride, Carbonate Alkalinity, Hydroxide Alkalinity, Non-filterable residue, TOC

# Appendix C
# Soil Data Validation Summary

# APPENDIX C

## SPRING 2001 IDAHO MINING ASSOCIATION AREA-WIDE INVESTIGATION

## SOIL DATA VALIDATION AND QUALITY CONTROL SUMMARY REPORT

The following is a summary of the data validation and quality control (QC) review conducted for the Spring 2001 Area-Wide Investigation sampling effort. This effort was completed on the behalf of the Idaho Mining Association (IMA). The University of Idaho (UI) Analytical Sciences Laboratory was the primary analytical laboratory performing the analyses. The Applied Physics & Chemistry (APC) Laboratory located in Chino, CA was the quality assurance (QA) laboratory tasked with analyzing surface soil samples collected at QA sampling locations. Both laboratories were selected prior to sampling, and both were proficient in the analysis of metals and other parameters as requested by the Idaho Department of Environmental Quality (IDEQ). Data analyzed by the University of Idaho and APC laboratories were subjected to validation procedures outlined by the Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses (EPA, December 1994).

42 total surface soil samples were taken, which included 5 randomly selected samples collected with additional amounts for submittal to QA/QC analysis. Samples were submitted under chain-of-custody to the University of Idaho and APC analytical laboratories. The UI laboratory analyzed the samples for the following:

- EPA 3050 (Ag, As, Ba, Be, Cd, Cr, Cu, Mn, Mo, Na, Ni, Pb, Sb, Tl, U, V, Z)
- EPA 245.7 (Hg)
- ICP Na-fusion (B)
- ICP Hydride (Se)

The APC Laboratory analyzed the samples for the following:

- EPA 300 (F)
- EPA 415.1 (TOC)
- SW6010B (Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Tl, V, Zn)
- SW7470A (Hg)

Data quality objectives (DQOs) are qualitative and quantitative statements that specify the quality of these data required to meet the goals of site investigation and/or to support decisions made in environmental management activities. DQOs for the Spring 2001 Area-Wide Investigation were expressed in terms of precision, accuracy, representativeness, completeness, and comparability (PARCC). The results of QC samples were evaluated against the DQOs and the quality of these data was assessed according to the PARCC parameters. QC sample results that fall outside these criteria serve to signal unacceptable or biased data that could result in corrective actions being implemented, or qualification of the data. The following is a summary review of these data, including data qualification that resulted from the data validation.

**Precision and Accuracy**

Precision and accuracy were evaluated based on the QC results generated from matrix spiked samples, laboratory duplicates, standard reference material analyses and laboratory control samples.

Standard reference materials were analyzed with the samples. The primary laboratory analyzed SRMs with acceptable results. UI analyzed SRMs identified as NIST SRM 2709, NIST SRM

2710, and NIST 2711 Montana Soil for mercury; NIST SRM 2709 for selenium; and HRM J, HRM S, NIST 2710, and NIST 2711 for metals screen.

UI data was flagged for various reasons including U, J, and R/UR for 11 different analytes. Data that were flagged as J under laboratory control sample results include barium, beryllium, chromium, copper, manganese, silver, and sodium. Sodium data were flagged as R/UR due to unacceptable laboratory control sample results, and those data were rejected. Data that were flagged as J for duplicates include boron, thallium, and uranium. SRM results for selenium and mercury also resulted in J qualifiers due to analytical results. Mercury was also flagged as J due to blank spike recovery results. Calibration standards for boron also resulted in a J flag of those data.

Serial dilution was measured by APC with several analytes flagged as J for various reasons. These 11 analytes include aluminum, barium, chromium, iron, magnesium, manganese, molybdenum, nickel, selenium, vanadium, and zinc. Three analytes also flagged as J for matrix spike results were aluminum, chromium, and magnesium.

**Representativeness**

Representativeness was evaluated through the analysis of laboratory method blanks and equipment blanks. The evaluation of blanks is evaluated before and during the analytical process. UI data was flagged as U for one sample of lead, 45 of 47 samples of thallium, according to the criteria. Blanks analyzed by APC were not flagged as the results were all acceptable.

**Completeness**

Data was 95% complete due to the rejection of sodium results. Sodium data from the UI was rejected due to laboratory control samples outside of acceptable limits. Both laboratories provided raw data packets that contained information on the specific analytes to which surface soil samples were subjected. Field QA/QC samples were collected and analyzed by the UI and APC as required. Completeness of data did not occur in sodium, as the raw data packets were missing. Analytical data were discoverable in raw data packets from the UI and APC. All sample analytical holding times were met within acceptable limits. Blank spike and matrix spike amounts were written on various QC sheets. APC did not include a summary packet for check standards, but it was included in the raw data printouts.

**Comparability**

Comparability was achieved by UI and APC analyzing the samples according to the required methods. Each laboratory used acceptable methodology, which is recognized by the EPA in analyzing samples. Detection limits were reported by each laboratory for each specific analyte and included in either the raw data packet or electronic files.

**Summary of Data Quality**

The evaluation of the PARCC criteria provided information on the quality of the data. The majority of data were considered usable. Sodium data from the UI was rejected due to laboratory control samples outside of acceptable limits.

## References

EPA 1994. "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses." Publication 9240.1-26, EPA/540/R/94/083, PB95-963525. Office of Solid Waste and Emergency Response, USEPA, Washington, D.C.

Montgomery Watson Harza 2001. "Sampling and Analysis Plan – Southeast Idaho Phosphate Resource Area Selenium Project, Spring 2001 Area – Wide Investigation." April.

# INORGANIC DATA ASSESSMENT SUMMARY

| | |
|---|---|
| PROJECT: IMA Selenium Project | SITE: Southeast Idaho |
| LABORATORY:<br>Primary Laboratory: U of I- Holm Research Center<br>QC Laboratory: APCL | SDG: |
| SAMPLES/MATRIX/ANALYSES: | |
| • Spring 2001 | |
| • Matrix: Surface Soil | |
| • Methods: EPA 3050, EPA 245.7, ICP Na-fusion, EPA 300, EPA 415.1, SW6010B, SW7470A | |
| • Analyses: Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Tl, U, V, Z, G, Hg, TOC | |

# DATA ASSESSMENT SUMMARY

| REVIEW ITEM | ICP | AA | HG | CYANIDE | OTHER |
|---|---|---|---|---|---|
| 1. Data completeness | See Discussion | | O | | |
| 2. Holding Times | O | | O | | |
| 3. Calibration | See Discussion | | O | | |
| 4. Blanks | O | | O | | |
| 5. ICS | See Discussion | | O | | |
| 6. LCS | See Discussion | | O | | |
| 7. Duplicate RPD | See Discussion | | O | | |
| 8. Spike Recovery | See Discussion | | O | | |
| 9. MSA | N/A | | N/A | | |
| 10. Other QC | N/A | | N/A | | |
| 11. Field Duplicates | N/A | | N/A | | |
| 12. Result Verification | See Discussion | | O | | |
| 13. Overall Assessment | See Discussion | | O | | |

O=Data had no problems/or qualified due to minor problems.
M=Data qualified due to major problems.
NA=Data review item not applicable.
X=Problems but do not affect data.
Z=Data unacceptable.

Comments/Qualified Results:
Sodium results rejected. See individual sections below for an explanation of the results from the data validation process. All other data were acceptable.

Verified and Validated by: _____ Date: 4 FEB 02
Reviewed and Approved by: _____ Date: 2/22/02

INORGANIC DATA ASSESSMENT SUMMARY

| | Acceptable Yes | No |
|---|---|---|
| 1. Data package completeness (check if present) | _X_ | ___ |

_X_Case narrative
_X_Chain of custody
_X_Sample Results
_X_ICV/CCV Results
_X_Blank Results
_X_ICP Interference Check Results
_X_Spike Recovery Results
_X_Duplicate Results
_X_LCS Results
___Standard Addition Results
_X_ICP Serial Dilution
_X_Instrument Det. Limits
___ICP Correction Factors
___ICP Linear Ranges
_X_Preparation Logs
_X_Analysis Run Logs
_X_ICP Raw Data
_X_GFAA Raw Data
___Hg Raw Data
___Cyanide Raw Data
_X_Other_____

Comments/Qualified Results:

Raw data packets not included for sodium analyses.
ICP interference checks completed on APCL analyses only

| | | |
|---|---|---|
| 2. Holding times (check all that apply) | _X_ | ___ |

_X_ICP/GFAA metals completed in <6 mos from collection
_X_Mercury analyzed in <28 days from collection
___Cyanide completed in 14 days from collection

Qualify as estimated (J, UJ) all results analyzed past the holding times listed but within 2x times the limit. Qualify detects as estimated (J) and non-detects unusable (UR) for results analyzed greater than 2x above the limit. If soil data are qualified based on water holding time criteria, note.

Comments/Qualified Results:
All samples were analyzed by the UI within acceptable holding times.
All samples were analyzed by APCL within acceptable holding times.

| | Acceptable Yes | No |
|---|---|---|
| 3. Calibrations (check all that apply) | _X_ | ___ |

___GFAA/Hg correlation coefficient <0.995, results estimated (J, UJ)
_X_ICV/CCV %R, ICP 89-111%, Hg 80-120%, Cn 85-115%, results acceptable
___ICV/CCV %R, ICP 75-89%, Hg 65-79%, Cn 70-84%m results <IDL estimated (UJ)
___ICV/CCV %R, ICP <75%, Hg <65%, Cn <70%, results unusable (R)
___ICV/CCV %R, ICP >125%, Hg >135%, Cn >130%, results >IDL unusable (R), <IDL acceptable
_X_ICV/CCV %R, ICP 75-89% or 111-125%, Hg 65-79% or 121-135%, Cn 70-84% or 116-130%, results >IDL estimated (J)

Comments/Qualified Results:
UI - Boron data flagged as J due to calibrations outside of acceptable range.

| | Acceptable Yes | No |
|---|---|---|
| 4. Blanks (check all that apply) | _X_ | ___ |

_X_Detects reported ICB/CCB, list:
Boron

___Detects in preparation blanks, list:

___Detects in field blanks, list:

Qualify as undetected (U) all sample concentrations ≤5X any blank concentrations.

Comments/Qualified Results:

UI –Boron had detects in 7 of 9 blank samples resulting in data flagged as U.
APCL – No detections found in blanks.

| | Acceptable Yes | No |
|---|---|---|
| 5. Interference Checks (check all that apply) | __X_ | ___ |

_X_ICS A/B Recoveries Acceptable
_X_Al, Ca, Fe, Mg sample concentrations >ICS concentrations
___ICS %R> 120%, results > IDL estimated (J)
___ICS %R 50-79%, results>IDL estimated (J), possible false negative
___ICS %R 50-79%, results <IDL estimated (UJ)
___ICS %R <50%, results >IDL and <IDL rejected (R/UR)
___ICS %R>120, results <IDL acceptable

Comments/Qualified Results:

Interference checks not run by APCL for TOC, sodium, fluoride or boron analyses, but run for all other analyses. Potassium results were incalculable.
UI did not run interference checks in any analyses.

| | | |
|---|---|---|
| 6. Laboratory Control Samples (check all that apply) | _X_ | _X -Na_ |

_X_LCS %R 80-120 (Ag, Sb no limits)
_X_LCS %R 50-79% or >120%, results>IDL estimated (J)
___LCS %R 50-79% and results <IDL estimated (UJ)
_X_LCS %R <50% and all results rejected (R/UR)
___LCS %R >120%, results <IDL acceptable

Comments/Qualified Results:
UI laboratory control samples were qualified as J for barium, beryllium, chromium, copper, manganese, and silver. Sodium results were qualified as R/UR due to low recovery.
APCL – Laboratory control samples were not anaylzed.

| | | |
|---|---|---|
| 7. Duplicate (check all that apply) | __X_ | ___ |

_X_Duplicate RPD $\leq$20% for waters ($\leq$35% for soils) for results >5X CRDL
_X_Duplicate Range is within $\pm$CRDL ($\pm$2xCRDL for soils) for results $\leq$ 5X CRDL
_X_Qualify positive results estimated (J) if the above criteria were not met.

Comments/Qualified Results:
UI – Boron, thallium and uranium results flagged as J for duplicate recovery.
APCL –Duplicate results not recorded for potassium.

Acceptable
Yes No

8. Spike Recovery (check all that apply) __X_ ___

_X_Spike %R with 75-125%
_X_Spike %R 30-74%, >125%, results >IDL estimated (J)
___Spike %R 30-74% results <IDL estimated (UJ)
_X_Spike %R <30%, results <IDL rejected (UR)
___Field blank used for spike analysis
___Spike % R >125%, results <IDL acceptable
_X_Sample concentration exceeds spike concentration by a factor of >4x, acceptable

Comments/Qualified Results:
UI – Mercury results flagged as J due to blank spike recovery. Selenium, cadmium, boron and mercury were the only analyses that included spikes.
APCL – Aluminum, chromium, and magnesium were flagged as J due to matrix spike recovery. Spike results for zinc should have been rejected but were acceptable; spike concentration was 52X > sample concentration.

9. GFAA Performance (check all that apply) __X_ ___

___Duplicate injection RSD<20%
___Duplicate injection RSD>20%, results >CRDL estimated (J)
___Analytical spike %R 85-115%
___Analytical spike %R 40-85%, results >IDL estimated (J)
___Analytical spike %R 10-40%, results <IDL estimated (UJ)
___Analytical spike %R <10%, results <IDL rejected (R)
___Analytical spike %R <40%, results >IDL estimated (J)
___MSA required but not run, results estimated (J)
___MSA run at incorrect level, results estimated (J)
___MSA correlation coefficient <0.995, results estimated (J)

Comments/Qualified Results:
UI – not analyzed.
APCL – not analyzed.

---

10. Serial Dilution (check all that apply) __X_ ___

_X_Serial Dilution %D within 10% for sample results >50x the IDL
_X_Serial Dilution %D greater than 10%, results >50x the IDL estimated (J)

Comments/Qualified Results:
UI – serial dilution runs not conducted.
APCL – Aluminum, barium, chromium, iron, magnesium, manganese, molybdenum, nickel, selenium, vanadium, and zinc were flagged as J due to serial dilution results.

Acceptable

Yes No

11. Field Duplicates (check all that apply) __X_ ___

___Field duplicate RPD ≤20% waters (≤35% for soils)
___Field duplicate range is within ±CRDL (±2x CRDL for soils) for results <5xCRDL

Note: There are no qualification requirements for field QC samples exceeding limits.

Comments/Qualified Results:
No field duplicates were collected for analyses.

12. Result Verification (check all that apply) __X_ ___

___All results supported in raw data

Comments/Qualified Results:
UI – Raw data packets for sodium were not included in the deliverable to MWH.
APCL – Results included.

13. Overall Assessment _X_ _X-Na_

- Data were acceptable, except for sodium analyses conducted by the UI. Data were flagged as J and U for various reasons. Discussion is included in the above sections, as well as in data assessment summary for each analyte from UI and APCL.

- Sample results <RL (APCL) or <EDL (UI) were qualified as U for the following analytes:

  APCL
  Antimony
  Thallium

  UI
  Thallium
  Antimony
  Lead

# Appendix D
# Validated Surface Water Data

## Appendix D- Spring 2001 Area-Wide Investigation
## Surface Water Data Results

The data, as presented in the tables within Chapter 2 of this report, are validated in strict accordance with USEPA's data validation functional guidelines (USEPA, 1994). However, for an investigation that demands knowledge of trace levels of a trace element having a very low regulatory criterion, these validation guidelines require that data, at their low end, be censored. Such censorship results in the loss of information that is useful to the data analyst (Gilbert, 1987) and, thereby, potentially meaningful to the risk manager.

Gilbert (1987), one of the world's preeminent environmental statisticians, offers this recommendation on how to deal with data near detection limits:

It is strongly recommended here that, whenever the measurement technique permits, report the actual measurement, whatever it may be, even if it is negative. Similar recommendations are also made by [U.S.] Environmental Protection Agency (USEPA,1980 Chapter 6) and American Society for Testing and Materials (ASTM, 1984).

Because most, if not all, modern methods of environmental chemical measurement in the laboratory permit it, it is beneficial to avoid data censorship. In order to maintain the quality of the data by adhering to Gilbert's recommendation, the uncensored data is presented in this appendix. The uncensored data presented here are validated within the context of the USEPA validation protocols except for the fact that they are not censored. These preserved and validated data allow a data analyst to avoid having to fabricate pseudo-values during subsequent data analyses, thereby allowing a higher quality evaluation of the data.

### References:

American Society for Testing and Materials (ASTM), 1984. *Annual Book of ASTM Standards*, "Section 11, Water and Environmental Technology," vol. 11.01, designation D4210-83.

Gilbert, R. O., 1987. *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

U.S. Environmental Protection Agency (USEPA), 1980. Upgrading Environmental Radiation Data. United States Environmental Protection Agency, Office of Radiation Programs. EPA/520/1-80-012.

U.S. Environmental Protection Agency (USEPA), 1994. Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA/540/R/94/083. Publication 9240-1-26.

**APPENDIX D**
**SPRING 2001 AREA-WIDE INVESTIGATION SURFACE WATER DATA RESULTS**

| Station ID | Facility Name | MWH ID | UI Sample ID | Aluminum mg/L | Flag | Antimony mg/L | Flag | Arsenic mg/L | Flag | Barium mg/L | Flag | Beryllium mg/L | Flag | Boron mg/L | Flag | Cadmium mg/L | Flag | Calcium mg/L | Flag | Chromium mg/L | Flag | Copper mg/L | Flag | Iron mg/L | Flag | Lead mg/L | Flag | Magnesium mg/L | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS005 | North Maybe Mine East Mill Dump Seep | 051601SWDS005 | E0100343 | 0.00080 | 0.034 UJ | 0.00048 | 0.0025 U | 0.00055 | | 0.028 | 0.065 UJ | -0.0010 | 0.005 U | 0.012 | 0.025 U | 0.00094 | | 140 | | 0.0095 | | 0.00086 | 0.0012 U | -0.014 | 0.01 U | 0.000027 | 0.0027 U | 27 | |
| DS006 | Champ Mine Goodheart Creek Seep | 051601SWDS006 | E0100342 | 0.0090 | 0.034 UJ | 0.00054 | 0.0025 U | 0.00096 | | 0.028 | 0.065 UJ | -0.00090 | 0.005 U | 0.020 | 0.025 U | 0.000066 | 0.00070 U | 350 | | 0.0067 | 0.008 U | 0.0017 | | 0.00030 | 0.01 U | 0.000046 | 0.0027 U | 63 | |
| DS007 | Mountain Fuel Mine Seep #1 | 051901SWDS007 | E0100459 | 0.000088 | 0.034 UJ | 0.0012 | 0.0025 U | 0.00079 | | 0.032 | 0.065 UJ | -0.0019 | 0.005 U | 0.0018 | 0.025 U | 0.00021 | 0.00070 U | 110 | | 0.0037 | 0.008 U | 0.0011 | 0.0012 U | 0.00040 | 0.01 U | 0.00030 | 0.0027 U | 38 | |
| DS008 | Mountain Fuel Mine Seep #2 | 051801SWDS008 | E0100457 | 0.00046 | 0.034 UJ | 0.00024 | 0.0025 U | 0.0014 | | 0.020 | 0.065 UJ | -0.0017 | 0.005 U | 0.0047 | 0.025 U | 0.000027 | 0.00070 U | 38 | 46 U | 0.00075 | 0.008 U | 0.00076 | 0.0012 U | 0.0089 | 0.01 U | 0.000016 | 0.0027 U | 33 | |
| DS009 | Rasmussen Ridge Mine Unit I Overburden Dump Seep | 051801SWDS009 | E0100465 | 0.0028 | 0.034 UJ | 0.00025 | 0.0025 U | 0.00043 | 0.0005 U | 0.0085 | 0.065 UJ | -0.0028 | 0.005 U | 0.036 | | 0.0089 | | 490 | | 0.00070 | 0.008 U | 0.0039 | | 0.019 | 0.01 U | 0.000075 | 0.0027 U | 230 | |
| DS010 | Wooley Valley Mine Unit I Overburden Dump Seep | 051901SWDS010 | E0100460 | 0.0048 | 0.034 UJ | 0.00071 | 0.0025 U | 0.00078 | | 0.032 | 0.065 UJ | -0.0018 | 0.005 U | 0.0061 | 0.025 U | 0.00017 | 0.00070 U | 130 | | 0.0053 | 0.008 U | 0.0015 | | 0.011 | | 0.00034 | 0.0027 U | 26 | |
| DS011 | Wooley Valley Mine Unit III Overburden Dump Seep | 052101SWDS011 | E0100499 | 0.000056 | 0.034 UJ | 0.00051 | 0.0025 U | 0.00024 | 0.0005 U | 0.050 | 0.065 UJ | -0.0027 | 0.005 U | 0.0019 | 0.025 U | 0.0012 | | 120 | | 0.028 | | 0.0016 | | -0.013 | 0.01 U | 0.000080 | 0.0027 U | 35 | |
| DS012 | Wooley Valley Mine Unit IV Overburden Dump Seep | 052101SWDS012 | E0100496 | -0.00069 | 0.034 UJ | 0.000043 | 0.0025 U | 0.000076 | 0.0005 U | 0.050 | 0.065 UJ | -0.0027 | 0.005 U | 0.0053 | 0.025 U | 0.0000022 | 0.00070 U | 390 | | 0.021 | | 0.0014 | | -0.013 | 0.01 U | -0.000052 | 0.0027 U | 81 | |
| DS015 | Conda Mine Waste Dump South Woodall Seep | 052201SWDS015 | E0100561 | 0.00033 | 0.034 UJ | 0.00075 | 0.0025 U | 0.0011 | | 0.013 | 0.065 UJ | -0.0027 | 0.005 U | 0.037 | | 0.0070 | | 600 | | 0.013 | | 0.0039 | | -0.012 | 0.01 U | 0.000051 | 0.0027 U | 220 | |
| DS017 | Conda Mine Meadow Dump Seep | 052301SWDS017 | E0100581 | 0.0048 | 0.034 UJ | -0.00026 | 0.0025 U | -0.000032 | 0.0005 U | 0.075 | J | -0.0017 | 0.005 U | 0.0077 | 0.025 U | 0.000058 | 0.00070 U | 120 | | 0.0048 | 0.008 U | 0.00040 | 0.0012 U | 0.0063 | 0.01 U | 0.000028 | 0.0027 U | 25 | |
| DS018 | Conda Mine Dump Seep #4 | 052201SWDS018 | E0100559 | -0.0018 | 0.034 UJ | 0.00064 | 0.0025 U | 0.00097 | | 0.020 | 0.065 UJ | -0.0028 | 0.005 U | 0.023 | 0.025 U | 0.0061 | | 460 | | 0.017 | | 0.0021 | | -0.0087 | 0.01 U | 0.00030 | 0.0027 U | 100 | |
| DS019 | Conda Mine Dump Seep #7 | 052301SWDS019 | E0100580 | 0.0032 | 0.034 UJ | 0.0017 | 0.0025 U | 0.0012 | | 0.020 | 0.065 UJ | -0.0019 | 0.005 U | 0.021 | 0.025 U | 0.0047 | | 560 | | 0.0076 | 0.008 U | 0.0033 | | 0.022 | | 0.0000021 | 0.0027 U | 120 | |
| DS020 | Mountain Fuel New Spring #1 | 051901SWDS020 | E0100458 | 0.00013 | 0.034 UJ | 0.00094 | 0.0025 U | 0.0042 | | 0.064 | 0.065 UJ | -0.0020 | 0.005 U | 0.011 | 0.025 U | 0.012 | | 290 | | 0.00052 | 0.008 U | 0.0015 | | 0.058 | | -0.0000097 | 0.0027 U | 80 | |
| DS021 | Conda Mine French Drain | 052301SWDS021 | E0100583 | 0.0070 | 0.034 UJ | -0.0000084 | 0.0025 U | 0.0016 | | 0.099 | J | -0.0018 | 0.005 U | 0.011 | 0.025 U | 0.00019 | 0.00070 U | 190 | | 0.0079 | 0.008 U | 0.00084 | 0.0012 U | 0.022 | | 0.000075 | 0.0027 U | 50 | |
| DS022 | Henry Mine South Pit Overburden Dump Limestone Drai | 051501SWDS022 | E0100273 | 0.00067 | 0.034 UJ | 0.00012 | 0.0025 U | 0.00042 | 0.0005 U | 0.015 | 0.065 UJ | 0.00020 | 0.005 U | 0.015 | 0.025 U | 0.000091 | 0.00070 U | 100 | | 0.018 | | 0.00096 | 0.0012 U | -0.010 | 0.01 U | -0.000030 | 0.0027 U | 44 | |
| DS023 | Conda Mine Dump Seep #2 | 052201SWDS023 | E0100560 | -0.00080 | 0.034 UJ | 0.00014 | 0.0025 U | 0.0011 | | 0.046 | 0.065 UJ | -0.0028 | 0.005 U | 0.0020 | 0.025 U | 0.00019 | 0.00070 U | 200 | | 0.0017 | 0.008 U | 0.0015 | | 0.0078 | 0.01 U | 0.00013 | 0.0027 U | 48 | |
| DS024 | Conda Mine Dump Seep #3 | 052301SWDS024 | E0100579 | 0.00036 | 0.034 UJ | 0.000018 | 0.0025 U | 0.00035 | 0.0005 U | 0.037 | 0.065 UJ | -0.0017 | 0.005 U | 0.0048 | 0.025 U | 0.0033 | | 550 | | 0.012 | | 0.0033 | | -0.0019 | 0.01 U | -0.000036 | 0.0027 U | 140 | |
| DS025 | Enoch Valley Mine West Dump Seep | 051501SWDS025 | E0100272 | 0.00086 | 0.034 UJ | 0.00012 | 0.0025 U | 0.0081 | | 0.031 | 0.065 UJ | 0.00020 | 0.005 U | 0.026 | | 0.00080 | | 250 | | 0.019 | | 0.0015 | | 6.5 | | -0.000070 | 0.0027 U | 64 | |
| DS026 | Enoch Valley Mine South Dump Seep | 051401SWDS026 | E0100266 | 0.00037 | 0.034 UJ | 0.00010 | 0.0025 U | 0.00037 | 0.0005 U | 0.023 | 0.065 UJ | -0.0034 | 0.005 U | 0.0052 | 0.025 U | 0.0049 | | 140 | | 0.0085 | | 0.0018 | | -0.0084 | 0.01 U | -0.000021 | 0.0027 U | 79 | |
| DS027 | Ballard Mine Garden Hose Seep | 051501SWDS027 | E0100267 | 0.000048 | 0.034 UJ | 0.00064 | 0.0025 U | 0.00034 | 0.0005 U | 0.039 | 0.065 UJ | 0.00020 | 0.005 U | 0.016 | 0.025 U | 0.000041 | 0.00070 U | 130 | | 0.023 | | 0.00058 | 0.0012 U | -0.019 | 0.01 U | 0.000013 | 0.0027 U | 16 | 21 U |
| DS028 | Smoky Canyon Mine Dump Seep DP-1C | 052201SWDS028 | E0100591 | 0.0039 | 0.034 UJ | 0.00014 | 0.0025 U | 0.00074 | | 0.054 | 0.065 UJ | -0.0017 | 0.005 U | 0.15 | | 0.00094 | | 210 | | 0.0055 | 0.008 U | 0.0017 | | -0.0038 | 0.01 U | -0.0000035 | 0.0027 U | 60 | |
| DS029 | Smoky Canyon Mine Dump Seep DP-7 | 052201SWDS029 | E0100590 | 0.0044 | 0.034 UJ | 0.00014 | 0.0025 U | 0.00039 | 0.0005 U | 0.066 | J | -0.0019 | 0.005 U | 0.037 | | 0.0088 | | 480 | | 0.0067 | 0.008 U | 0.0012 | 0.0012 U | 0.010 | 0.01 U | 0.000011 | 0.0027 U | 58 | |
| SP003 | Mountain Fuel Stock Pond | 051701SWSP003 | E0100368 | 0.012 | 0.034 UJ | 0.0014 | 0.0025 U | 0.0046 | | 0.0019 | 0.065 UJ | 0.000033 | 0.005 U | 0.0052 | 0.025 U | 0.000030 | 0.00070 U | 130 | | 0.0043 | 0.008 U | 0.0015 | | 0.026 | | -0.000047 | 0.0027 U | 46 | |
| SP004 | Mountain Fuel Mine Spring #2 | 051701SWSP004 | E0100367 | 0.0095 | 0.034 UJ | 0.0031 | | 0.0040 | | 0.056 | 0.065 UJ | ND | 0.005 U | 0.0061 | 0.025 U | 0.0017 | | 150 | | 0.010 | | 0.0038 | | -0.020 | 0.01 U | -0.000048 | 0.0027 U | 30 | |
| SP005 | Mountain Fuel Mine Spring #3 | 051701SWSP005 | E0100366 | 0.015 | 0.034 UJ | 0.00091 | 0.0025 U | 0.0030 | | 0.058 | 0.065 UJ | 0.00020 | 0.005 U | 0.0047 | 0.025 U | 0.000096 | 0.00070 U | 63 | | 0.0056 | 0.008 U | 0.0016 | | -0.0094 | 0.01 U | -0.000059 | 0.0027 U | 14 | 21 U |
| SP007 | Wooley Valley Mine Unit III Shop Pond | 052101SWSP007 | E0100494 | 0.019 | 0.034 UJ | 0.00081 | 0.0025 U | 0.0030 | | 0.022 | 0.065 UJ | -0.0026 | 0.005 U | 0.032 | | 0.000060 | 0.00070 U | 29 | 46 U | 0.0057 | 0.008 U | 0.0016 | | 0.033 | | 0.000062 | 0.0027 U | 12 | 21 U |
| SP008 | Wooley Valley Mine Unit III Overburden Pond | 052101SWSP008 | E0100497 | 0.0029 | 0.034 UJ | 0.00089 | 0.0025 U | 0.00037 | 0.0005 U | 0.0058 | 0.065 UJ | -0.0029 | 0.005 U | 0.0032 | 0.025 U | 0.00014 | 0.00070 U | 53 | | 0.0043 | 0.008 U | 0.00085 | 0.0012 U | 0.021 | | 0.00033 | 0.0027 U | 43 | |
| SP009 | Lanes Creek Mine Pond | 052101SWSP009 | E0100505 | 0.020 | 0.034 UJ | 0.00082 | 0.0025 U | 0.0046 | | 0.016 | 0.065 UJ | -0.0027 | 0.005 U | 0.0039 | 0.025 U | 0.00030 | 0.00070 U | 24 | 46 U | 0.00075 | 0.008 U | 0.0044 | | 0.016 | | 0.000035 | 0.0027 U | 6.9 | 21 U |
| SP010 | Ballard Mine Dredge Pond | 051501SWSP010 | E0100268 | 0.0013 | 0.034 UJ | 0.0014 | 0.0025 U | 0.0033 | | 0.034 | 0.065 UJ | 0.00030 | 0.005 U | 0.036 | | 0.00037 | 0.00070 U | 240 | | 0.023 | | 0.0043 | | -0.010 | 0.01 U | -0.000046 | 0.0027 U | 57 | |
| SP011 | Ballard Mine Upper Elk Pond | 051501SWSP011 | E0100270 | 0.011 | 0.034 UJ | 0.00086 | 0.0025 U | 0.0061 | | 0.0075 | 0.065 UJ | 0.00015 | 0.005 U | 0.018 | 0.025 U | 0.0013 | | 28 | 46 U | 0.0064 | 0.008 U | 0.0041 | | 0.0018 | 0.01 U | -0.000042 | 0.0027 U | 6.0 | 21 U |
| SP012 | Ballard Mine Lower Elk Pond | 051501SWSP012 | E0100269 | 0.0054 | 0.034 UJ | 0.0011 | 0.0025 U | 0.0039 | | 0.0077 | 0.065 UJ | 0.00010 | 0.005 U | 0.014 | 0.025 U | 0.00097 | | 32 | 46 U | 0.010 | | 0.0034 | | -0.0023 | 0.01 U | -0.000068 | 0.0027 U | 8.2 | 21 U |
| SP014 | Henry Mine Henry Pond | 051501SWSP014 | E0100274 | 0.0017 | 0.034 UJ | 0.00034 | 0.0025 U | 0.0016 | | 0.030 | 0.065 UJ | 0.00040 | 0.005 U | 0.014 | 0.025 U | 0.000090 | 0.00070 U | 90 | | 0.0066 | 0.008 U | 0.0013 | | -0.012 | 0.01 U | -0.000060 | 0.0027 U | 56 | |
| SP015 | Henry Mine Smith Pond | 051501SWSP015 | E0100275 | 0.0010 | 0.034 UJ | 0.00046 | 0.0025 U | 0.0021 | | 0.030 | 0.065 UJ | ND | 0.005 U | 0.016 | 0.025 U | 0.00021 | 0.00070 U | 120 | | 0.012 | | 0.0020 | | -0.0033 | 0.01 U | -0.000048 | 0.0027 U | 35 | |
| SP016 | Henry Mine Center Henry Pond | 051501SWSP016 | E0100276 | 0.0072 | 0.034 UJ | 0.00049 | 0.0025 U | 0.0013 | | 0.036 | 0.065 UJ | 0.00020 | 0.005 U | 0.0081 | 0.025 U | 0.000060 | 0.00070 U | 91 | | 0.0078 | 0.008 U | 0.0011 | 0.0012 U | -0.010 | 0.01 U | -0.000060 | 0.0027 U | 17 | 21 U |
| SP017 | Enoch Valley Mine South Pond | 051401SWSP017 | E0100258 | 0.0035 | 0.034 UJ | 0.00052 | 0.0025 U | 0.0010 | | 0.020 | 0.065 UJ | -0.0035 | 0.005 U | 0.012 | 0.025 U | 0.00039 | 0.00070 U | 250 | | 0.0050 | 0.008 U | 0.0024 | | -0.0045 | 0.01 U | 0.0000015 | 0.0027 U | 78 | |
| SP018 | Enoch Valley Mine Keyhole Pond | 051401SWSP018 | E0100259 | 0.074 | J | 0.0015 | 0.0025 U | 0.00082 | | 0.0061 | 0.065 UJ | -0.0035 | 0.005 U | 0.014 | 0.025 U | 0.050 | | 390 | | 0.0063 | 0.008 U | 0.0030 | | -0.0031 | 0.01 U | -0.000042 | 0.0027 U | 140 | |
| SP019 | Enoch Valley Mine Bat Cave Pond | 051401SWSP019 | E0100257 | 0.0062 | 0.034 UJ | 0.00086 | 0.0025 U | 0.0033 | | 0.011 | 0.065 UJ | -0.0034 | 0.005 U | 0.0063 | 0.025 U | 0.00014 | 0.00070 U | 99 | | 0.0029 | 0.008 U | 0.0021 | | -0.0028 | 0.01 U | 0.000026 | 0.0027 U | 29 | |
| SP020 | Enoch Valley Mine West Pond | 051401SWSP020 | E0100264 | 0.0070 | 0.034 UJ | 0.00050 | 0.0025 U | 0.0015 | | 0.015 | 0.065 UJ | -0.0033 | 0.005 U | 0.0043 | 0.025 U | 0.00013 | 0.00070 U | 62 | | 0.0013 | 0.008 U | 0.0012 | 0.0012 U | -0.0027 | 0.01 U | -0.000053 | 0.0027 U | 12 | 21 U |
| SP021 | Enoch Valley Mine Stock Pond | 051401SWSP021 | E0100263 | 0.0024 | 0.034 UJ | 0.00057 | 0.0025 U | 0.0016 | | 0.011 | 0.065 UJ | -0.0035 | 0.005 U | 0.021 | 0.025 U | 0.0046 | | 180 | | 0.0055 | 0.008 U | 0.0016 | | -0.0094 | 0.01 U | -0.000046 | 0.0027 U | 51 | |
| SP022 | Enoch Valley Mine Tipple Pond | 051401SWSP022 | E0100265 | 0.0041 | 0.034 UJ | 0.00028 | 0.0025 U | 0.0018 | | 0.068 | J | -0.0035 | 0.005 U | 0.082 | | 0.00017 | 0.00070 U | 140 | | 0.0024 | 0.008 U | 0.0013 | | -0.0072 | 0.01 U | -0.000060 | 0.0027 U | 26 | |
| SP023 | Enoch Valley Mine Haul Road Pond | 051401SWSP023 | E0100261 | 0.0057 | 0.034 UJ | 0.00062 | 0.0025 U | 0.0036 | | 0.032 | 0.065 UJ | -0.0034 | 0.005 U | 0.32 | | 0.00033 | 0.00070 U | 120 | | 0.0063 | 0.008 U | 0.0020 | | -0.0079 | 0.01 U | -0.000042 | 0.0027 U | 47 | |
| SP025 | Gay Mine W Pit Pond | 051701SWSP025 | E0100461 | 0.025 | 0.034 UJ | 0.00081 | 0.0025 U | 0.030 | | 0.055 | 0.065 UJ | -0.0020 | 0.005 U | 0.073 | | 0.000066 | 0.00070 U | 31 | 46 U | 0.0039 | 0.008 U | 0.0016 | | 0.0034 | 0.01 U | 0.00015 | 0.0027 U | 63 | |
| SP026 | Gay Mine Z Pit Pond | 051701SWSP026 | E0100463 | 0.0065 | 0.034 UJ | 0.00046 | 0.0025 U | 0.0011 | | 0.032 | 0.065 UJ | -0.0021 | 0.005 U | 0.033 | | 0.000075 | 0.00070 U | 37 | 46 U | 0.000075 | 0.008 U | 0.00062 | 0.0012 U | -0.0049 | 0.01 U | 0.000046 | 0.0027 U | 30 | |
| SP027 | Gay Mine South 40 Pit Pond | 051601SWSP027 | E0100336 | 0.068 | J | 0.00074 | 0.0025 U | 0.0028 | | 0.074 | J | -0.00097 | 0.005 U | 0.034 | | 0.00067 | 0.00070 U | 69 | | 0.0035 | 0.008 U | 0.0019 | | -0.015 | 0.01 U | 0.000074 | 0.0027 U | 42 | |
| SP030 | Conda Mine Dredge Pond | 052201SWSP030 | E0100585 | 0.0075 | 0.034 UJ | -0.000080 | 0.0025 U | 0.0053 | | 0.0041 | 0.065 UJ | -0.0016 | 0.005 U | 0.010 | 0.025 U | 0.000030 | 0.00070 U | 31 | 46 U | 0.00088 | 0.008 U | 0.00054 | 0.0012 U | 0.0084 | 0.01 U | 0.00000014 | 0.0027 U | 8.5 | 21 U |
| SP031 | Enoch Valley Mine Shop Pond | 051401SWSP031 | E0100260 | 0.016 | 0.034 UJ | 0.0019 | 0.0025 U | 0.0027 | | 0.028 | 0.065 UJ | -0.0035 | 0.005 U | 0.087 | | 0.0016 | | 83 | | 0.0065 | 0.008 U | 0.0021 | | 0.079 | | 0.000091 | 0.0027 U | 18 | 21 U |
| SP032 | Wooley Valley Mine Large Haul Road Pond | 051801SWSP032 | E0100449 | 0.0040 | 0.034 UJ | 0.0010 | 0.0025 U | 0.00046 | | 0.020 | 0.065 UJ | -0.0019 | 0.005 U | 0.040 | | 0.00027 | 0.00070 U | 120 | | 0.00027 | 0.008 U | 0.0012 | 0.0012 U | -0.0080 | 0.01 U | 0.00020 | 0.0027 U | 41 | |
| SP033 | Wooley Valley Mine Upper Angus Creek Reservoi | 051901SWSP033 | E0100450 | 0.0014 | 0.034 UJ | 0.00036 | 0.0025 U | 0.00038 | 0.0005 U | 0.024 | 0.065 UJ | -0.0018 | 0.005 U | 0.0018 | 0.025 U | 0.000045 | 0.00070 U | 130 | | 0.000045 | 0.008 U | 0.00072 | 0.0012 U | 0.0014 | 0.01 U | 0.00015 | 0.0027 U | 40 | |
| SP034 | Cond Mine Hoorah Hollow Pond | 052301SWSP034 | E0100582 | 0.000012 | 0.034 UJ | 0.00032 | 0.0025 U | 0.00033 | 0.0005 U | 0.028 | 0.065 UJ | -0.0015 | 0.005 U | 0.0068 | 0.025 U | 0.00027 | 0.00070 U | 49 | | 0.0031 | 0.008 U | 0.00049 | 0.0012 U | 0.0022 | 0.01 U | 0.00033 | 0.0027 U | 19 | 21 U |
| SP035 | Conda Mine NL4 Pond | 052301SWSP035 | E0100584 | 0.0099 | 0.034 UJ | 0.00075 | 0.0025 U | 0.0022 | | 0.032 | 0.065 UJ | -0.0014 | 0.005 U | 0.032 | | 0.0026 | | 100 | | 0.0041 | 0.008 U | 0.0011 | 0.0012 U | 0.0083 | 0.01 U | 0.000070 | 0.0027 U | 12 | 21 U |
| SP036 | Gay Mine Pond #1 above A-12 Pi | 051601SWSP036 | E0100334 | 0.0018 | 0.034 UJ | 0.00060 | 0.0025 U | 0.0033 | | 0.11 | J | -0.0012 | 0.005 U | 0.094 | | 0.000029 | 0.00070 U | 140 | | 0.0037 | 0.008 U | 0.0014 | | 0.021 | | 0.000077 | 0.0027 U | 74 | |
| SP037 | Gay Mine Pond #2 above A-12 Pi | 051601SWSP037 | E0100335 | 0.0024 | 0.034 UJ | 0.00055 | 0.0025 U | 0.0026 | | 0.12 | J | -0.0012 | 0.005 U | 0.072 | | 0.000037 | 0.00070 U | 140 | | 0.0032 | 0.008 U | 0.0015 | | 0.023 | | 0.000090 | 0.0027 U | 69 | |
| SP038 | Gay Mine A-12 Lake in A-12 Pi | 051601SWSP038 | E0100333 | 0.0020 | 0.034 UJ | 0.0015 | 0.0025 U | 0.0023 | | 0.073 | J | -0.0012 | 0.005 U | 0.063 | | 0.00021 | 0.00070 U | 140 | | 0.0017 | 0.008 U | 0.0018 | | -0.015 | 0.01 U | 0.00014 | 0.0027 U | 69 | |
| SP041 | Gay Mine East Limb North Pond | 051701SWSP041 | E0100462 | 0.0064 | 0.034 UJ | 0.00032 | 0.0025 U | 0.0019 | | 0.080 | J | -0.0019 | 0.005 U | 0.045 | | 0.000013 | 0.00070 U | 100 | | 0.0019 | 0.008 U | 0.00078 | 0.0012 U | -0.0020 | 0.01 U | 0.000089 | 0.0027 U | 37 | |
| SP044 | North Maybe Mine Pit Pond | 051801SWSP044 | E0100455 | 0.0099 | 0.034 UJ | 0.00094 | 0.0025 U | 0.0035 | | -0.0036 | 0.065 UJ | -0.0020 | 0.005 U | -0.0059 | 0.025 U | 0.0010 | | 41 | 46 U | 0.038 | | 0.0010 | 0.0012 U | -0.0049 | 0.01 U | 0.00000024 | 0.0027 U | 11 | 21 U |
| SP045 | Champ Mine Pit Pond | 051601SWSP045 | E0100344 | 0.0091 | 0.034 UJ | 0.00073 | 0.0025 U | 0.0013 | | 0.025 | 0.065 UJ | -0.00042 | 0.005 U | 0.0058 | 0.025 U | 0.0026 | | 190 | | 0.0035 | 0.008 U | 0.0013 | | -0.021 | 0.01 U | -0.000028 | 0.0027 U | 30 | |
| SP046 | Champ Mine Extension Pit Pond | 051601SWSP046 | E0100341 | 0.0067 | 0.034 UJ | 0.0012 | 0.0025 U | 0.0017 | | 0.022 | 0.065 UJ | -0.00090 | 0.005 U | -0.0056 | 0.025 U | 0.00083 | | 26 | 46 U | 0.0035 | 0.008 U | 0.0024 | | -0.016 | 0.01 U | 0.00015 | 0.0027 U | 4.6 | 21 U |
| SP047 | Mountain Fuel Mine North Pit Pond | 051801SWSP047 | E0100456 | 0.0092 | 0.034 UJ | 0.00067 | 0.0025 U | 0.0013 | | 0.0032 | 0.065 UJ | -0.0021 | 0.005 U | 0.0011 | 0.025 U | 0.0036 | | 75 | | 0.0028 | 0.008 U | 0.00090 | 0.0012 U | -0.0053 | 0.01 U | 0.000037 | 0.0027 U | 21 | 21 U |
| SP048 | Mountain Fuel Mine East Limb Pit Pond | 051701SWSP048 | E0100365 | 0.0093 | 0.034 UJ | 0.0020 | 0.0025 U | 0.0012 | | 0.073 | J | 0.00010 | 0.005 U | -0.00020 | 0.025 U | 0.0058 | | 130 | | 0.0062 | 0.008 U | 0.0015 | | -0.020 | 0.01 U | -0.000029 | 0.0027 U | 33 | |
| SP050 | Wooley Valley Mine Unit III Pit Pond (South | 052101SWSP050 | E0100495 | 0.030 | 0.034 UJ | 0.00015 | 0.0025 U | 0.00043 | 0.0005 U | 0.019 | 0.065 UJ | -0.0026 | 0.005 U | -0.0066 | 0.025 U | 0.000039 | 0.00070 U | 22 | 46 U | 0.0034 | 0.008 U | 0.0010 | 0.0012 U | -0.010 | 0.01 U | 0.000043 | 0.0027 U | 5.8 | 21 U |
| SP051 | Wooley Valley Mine Unit III Pit Pond (North | 052101SWSP051 | E0100500 | 0.018 | 0.034 UJ | 0.00033 | 0.0025 U | 0.00087 | | 0.0076 | 0.065 UJ | -0.0028 | 0.005 U | -0.0053 | 0.025 U | 0.000083 | 0.00070 U | 23 | 46 U | 0.0050 | 0.008 U | 0.0014 | | -0.014 | 0.01 U | 0.000034 | 0.0027 U | 7.4 | 21 U |
| SP054 | Smoky Canyon Mine A Pit Pond | 052201SWSP054 | E0100592 | 0.0067 | 0.034 UJ | 0.00064 | 0.0025 U | 0.00077 | | 0.0077 | 0.065 UJ | -0.0017 | 0.005 U | 0.036 | | 0.00031 | 0.00070 U | 43 | 46 U | 0.0017 | 0.008 U | 0.00075 | 0.0012 U | 6.0 | | 0.000019 | 0.0027 U | 11 | 21 U |
| SP055 | Henry Mine South Pit Pond | 051401SWSP055 | E0100262 | 0.0023 | 0.034 UJ | 0.00070 | 0.0025 U | 0.00080 | | 0.018 | 0.065 UJ | -0.0036 | 0.005 U | 0.0058 | 0.025 U | 0.039 | | 260 | | 0.014 | | 0.0017 | | -0.0084 | 0.01 U | -0.000077 | 0.0027 U | 63 | |
| SP059 | Ballard Mine Pit #4 Stock Pond | 051501SWSP059 | E0100271 | 0.038 | J | 0.0010 | 0.0025 U | 0.0030 | | 0.016 | 0.065 UJ | 0.00040 | 0.005 U | 0.012 | 0.025 U | 0.00057 | 0.00070 U | 18 | 46 U | 0.0088 | | 0.0021 | | -0.014 | 0.01 U | -0.000046 | 0.0027 U | 5.3 | 21 U |
| SP060 | Rasmussen Ridge Mine Unit I Overburden Runoff Pond #1 | 051801SWSP060 | E0100464 | 0.0075 | 0.034 UJ | 0.00015 | 0.0025 U | 0.00043 | 0.0005 U | 0.017 | 0.065 UJ | -0.0027 | 0.005 U | 0.0098 | 0.025 U | 0.0013 | | 480 | | 0.0012 | 0.008 U | 0.0036 | | 0.011 | | -0.000016 | 0.0027 U | 180 | |
| SP061 | Dry Valley Mine Pit B Pond | 052101SWSP061 | E0100498 | 0.0011 | 0.034 UJ | 0.0029 | | 0.00034 | 0.0005 U | 0.049 | 0.065 UJ | -0.0025 | 0.005 U | 0.0048 | 0.025 U | 0.0094 | | 92 | | 0.0023 | 0.008 U | 0.00070 | 0.0012 U | -0.014 | 0.01 U | 0.00012 | 0.0027 U | 19 | 21 U |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analys
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation proce
Data qualifier definitions are
(U) - The material was analyzed for, but was not detected. The value preceeding the U indicates the value below which results are considered undetect
(J) - The sample result is an estimated quantity
(R) - The data are unusable
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise. The value preceeding the UJ indicates the value below which results are considered undete
na: Not available
ND: Not detected

**APPENDIX D**
**SPRING 2001 AREA-WIDE INVESTIGATION SURFACE WATER DATA RESULTS**

| Station ID | Facility Name | MWH ID | UI Sample ID | Manganese mg/L | Flag | Molybdenum mg/L | Flag | Nickel mg/L | Flag | Potassium mg/L | Flag | Silver mg/L | Flag | Sodium mg/L | Flag | Thallium mg/L | Flag | Uranium mg/L | Flag | Vanadium mg/L | Flag | Zinc mg/L | Flag | Bicarbonate Alkalinity mg $CaCO_3$/L | Flag | Carbonate Alkalinity mg $CaCO_3$/L | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS005 | North Maybe Mine East Mill Dump Seep | 051601SWDS005 | E0100343 | -0.00080 | 0.002 U | 0.0085 | J | 0.0048 | | 1.6 | 9.5 U | -0.000012 | 0.0021 U | 4.6 | 22 UJ | 0.000015 | 0.0025 U | 0.0020 | 0.008 U | 0.0078 | 0.0095 UJ | 0.024 | J | 200 | 230 U | ND | 3.0 U |
| DS006 | Champ Mine Goodheart Creek Seep | 051601SWDS006 | E0100342 | 0.52 | | 0.0029 | J | 0.025 | | 1.6 | 9.5 U | -0.000013 | 0.0021 U | 14 | 22 UJ | 0.000029 | 0.0025 U | 0.0040 | 0.008 U | 0.003 | 0.0095 UJ | 0.034 | J | 290 | | ND | 3.0 U |
| DS007 | Mountain Fuel Mine Seep #1 | 051901SWDS007 | E0100459 | 0.013 | | 0.0064 | J | 0.011 | | 1.3 | 9.5 U | 0.00013 | 0.0021 U | 8.7 | 22 UJ | 0.000039 | 0.0025 U | 0.0050 | 0.008 U | 0.0022 | 0.0095 UJ | 0.0093 | 0.01 U | 220 | 230 U | ND | 3.0 U |
| DS008 | Mountain Fuel Mine Seep #2 | 051801SWDS008 | E0100457 | 0.011 | | 0.006 | J | 0.0038 | | 4.3 | 9.5 U | -0.000013 | 0.0021 U | 9.2 | 22 UJ | -0.000044 | 0.0025 U | 0.0028 | 0.008 U | -0.00055 | 0.0095 UJ | 0.0016 | 0.01 U | 210 | 230 U | 9.0 | |
| DS009 | Rasmussen Ridge Mine Unit I Overburden Dump Seep | 051801SWDS009 | E0100465 | 2.3 | | 0.0022 | 0.0025 UJ | 0.66 | | 3.8 | 9.5 U | -0.000014 | 0.0021 U | 20 | 22 UJ | 0.000039 | 0.0025 U | 0.010 | | -0.00071 | 0.0095 UJ | 1.8 | J | 170 | 230 U | ND | 3.0 U |
| DS010 | Wooley Valley Mine Unit I Overburden Dump Seep | 051901SWDS010 | E0100460 | 0.0045 | | 0.00092 | 0.0025 UJ | 0.0046 | | 0.92 | 9.5 U | 0.000013 | 0.0021 U | 7.2 | 22 UJ | 0.000042 | 0.0025 U | 0.0012 | 0.008 U | 0.0056 | 0.0095 UJ | 0.011 | J | 250 | | ND | 3.0 U |
| DS011 | Wooley Valley Mine Unit III Overburden Dump Seep | 052101SWDS011 | E0100499 | 0.014 | | 0.00048 | 0.0025 UJ | 0.0059 | | 1.3 | 9.5 U | -0.0000061 | 0.0021 U | 8.6 | 22 UJ | 0.00016 | 0.0025 U | 0.0057 | 0.008 U | 0.0098 | J | 0.014 | J | 300 | | ND | 3.0 U |
| DS012 | Wooley Valley Mine Unit IV Overburden Dump Seep | 052101SWDS012 | E0100496 | 17 | | 0.0037 | J | 0.031 | | 2.9 | 9.5 U | -0.000022 | 0.0021 U | 13 | 22 UJ | -0.000098 | 0.0025 U | 0.0020 | 0.008 U | -0.0015 | 0.0095 UJ | 0.020 | J | 340 | | ND | 3.0 U |
| DS015 | Conda Mine Waste Dump South Woodall Seep | 052201SWDS015 | E0100561 | -0.0024 | 0.002 U | 0.088 | J | 0.16 | | 5.2 | 9.5 U | -0.00027 | 0.0021 U | 25 | J | 0.00020 | 0.0025 U | 0.016 | | 0.015 | J | 0.37 | J | 210 | 230 U | ND | 3.0 U |
| DS017 | Conda Mine Meadow Dump Seep | 052301SWDS017 | E0100581 | 0.31 | | 0.00064 | 0.0025 UJ | 0.0021 | 0.0033 U | 0.46 | 9.5 U | -0.00030 | 0.0021 U | 11 | 22 UJ | 0.000032 | 0.0025 U | 0.0012 | 0.008 U | 0.0019 | 0.0095 UJ | 0.0096 | 0.01 U | 210 | 230 U | ND | 3.0 U |
| DS018 | Conda Mine Dump Seep #4 | 052201SWDS018 | E0100559 | 0.0068 | | 0.0075 | J | 0.12 | | 4.1 | 9.5 U | -0.00011 | 0.0021 U | 15 | 22 UJ | 0.00059 | 0.0025 U | 0.015 | | 0.0096 | J | 0.35 | J | 390 | | ND | 3.0 U |
| DS019 | Conda Mine Dump Seep #7 | 052301SWDS019 | E0100580 | 0.51 | | 0.032 | J | 0.31 | | 2.4 | 9.5 U | -0.00029 | 0.0021 U | 16 | 22 UJ | 0.00028 | 0.0025 U | 0.035 | | 0.0205 | J | 0.56 | J | 290 | | ND | 3.0 U |
| DS020 | Mountain Fuel New Spring #1 | 051901SWDS020 | E0100458 | 1.1 | | 0.079 | J | 0.099 | | 2.4 | 9.5 U | -0.0000055 | 0.0021 U | 15 | 22 UJ | 0.00016 | 0.0025 U | 0.016 | | 2.7 | J | 0.23 | J | 350 | | ND | 3.0 U |
| DS021 | Conda Mine French Drair | 052301SWDS021 | E0100583 | 0.045 | | 0.0045 | J | 0.016 | | 1.0 | 9.5 U | -0.00030 | 0.0021 U | 16 | 22 UJ | 0.00011 | 0.0025 U | 0.0044 | 0.008 U | 0.0074 | 0.0095 UJ | 0.050 | J | 340 | | ND | 3.0 U |
| DS022 | Henry Mine South Pit Overburden Dump Limestone Drai | 051501SWDS022 | E0100273 | 0.027 | | 0.0013 | 0.0025 UJ | 0.0054 | | 0.88 | 9.5 U | -0.000025 | 0.0021 U | 15 | 22 UJ | 0.000031 | 0.0025 U | 0.0080 | 0.008 U | 0.0036 | 0.0095 UJ | 0.010 | J | 410 | | ND | 3.0 U |
| DS023 | Conda Mine Dump Seep #2 | 052201SWDS023 | E0100560 | 0.032 | | 0.00050 | 0.0025 UJ | 0.0045 | | 2.1 | 9.5 U | -0.00019 | 0.0021 U | 14 | 22 UJ | 0.00016 | 0.0025 U | 0.00032 | 0.008 U | 0.001 | 0.0095 UJ | 0.017 | J | 34 | 230 U | ND | 3.0 U |
| DS024 | Conda Mine Dump Seep #3 | 052301SWDS024 | E0100579 | 0.043 | | 0.0025 | 0.0025 UJ | 0.024 | | 2.1 | 9.5 U | -0.00031 | 0.0021 U | 12 | 22 UJ | 0.00011 | 0.0025 U | 0.010 | | 0.0055 | 0.0095 UJ | 0.14 | J | 320 | | ND | 3.0 U |
| DS025 | Enoch Valley Mine West Dump Seep | 051501SWDS025 | E0100272 | 5.0 | | 0.0033 | J | 0.17 | | 3.0 | 9.5 U | -0.000012 | 0.0021 U | 12 | 22 UJ | 0.00029 | 0.0025 U | 0.0023 | 0.008 U | 0.0028 | 0.0095 UJ | 0.14 | J | 200 | 230 U | ND | 3.0 U |
| DS026 | Enoch Valley Mine South Dump Seep | 051401SWDS026 | E0100266 | 0.77 | | 0.00078 | 0.0025 UJ | 0.021 | | 1.6 | 9.5 U | -0.000028 | 0.0021 U | 16 | 22 UJ | 0.000081 | 0.0025 U | 0.071 | | 0.00175 | 0.0095 UJ | 0.047 | J | 320 | | ND | 3.0 U |
| DS027 | Ballard Mine Garden Hose Seep | 051501SWDS027 | E0100267 | 0.00080 | 0.002 U | 0.00072 | 0.0025 UJ | 0.0011 | 0.0033 U | 2.3 | 9.5 U | 0.0000011 | 0.0021 U | 9.8 | 22 UJ | 0.00016 | 0.0025 U | 0.0022 | 0.008 U | 0.0028 | 0.0095 UJ | 0.016 | J | 270 | | ND | 3.0 U |
| DS028 | Smoky Canyon Mine Dump Seep DP-1( | 052201SWDS028 | E0100591 | 0.012 | | 0.050 | J | 0.026 | | 3.3 | 9.5 U | -0.000071 | 0.0021 U | 55 | J | 0.000098 | 0.0025 U | 0.011 | | 0.0025 | 0.0095 UJ | 0.045 | J | 72 | 230 U | ND | 3.0 U |
| DS029 | Smoky Canyon Mine Dump Seep DP-7 | 052201SWDS029 | E0100590 | 0.38 | | 0.021 | J | 0.090 | | 2.4 | 9.5 U | -0.00029 | 0.0021 U | 11 | 22 UJ | 0.00021 | 0.0025 U | 0.028 | | 0.0092 | 0.0095 UJ | 0.23 | J | 350 | | ND | 3.0 U |
| SP003 | Mountain Fuel Stock Ponc | 051701SWSP003 | E0100368 | 0.028 | | 0.020 | J | 0.0081 | | 6.9 | 9.5 U | -0.000020 | 0.0021 U | 7.4 | 22 UJ | 0.000037 | 0.0025 U | 0.0020 | 0.008 U | 0.011 | J | 0.0086 | 0.01 U | 51 | 230 U | 39 | |
| SP004 | Mountain Fuel Mine Spring #2 | 051701SWSP004 | E0100367 | 0.0032 | | 0.075 | J | 0.018 | | 6.2 | 9.5 U | -0.000014 | 0.0021 U | 2.1 | 22 UJ | 0.00045 | 0.0025 U | 0.012 | | 0.026 | J | 0.014 | J | 93 | 230 U | 7.0 | |
| SP005 | Mountain Fuel Mine Spring #3 | 051701SWSP005 | E0100366 | 0.073 | | 0.023 | J | 0.0044 | | 4.6 | 9.5 U | -0.000015 | 0.0021 U | 1.3 | 22 UJ | 0.000074 | 0.0025 U | 0.0017 | 0.008 U | 0.0051 | 0.0095 UJ | 0.0036 | 0.01 U | 91 | 230 U | ND | 3.0 U |
| SP007 | Wooley Valley Mine Unit III Shop Ponc | 052101SWSP007 | E0100494 | 0.015 | | 0.0051 | J | 0.0061 | | 4.1 | 9.5 U | -0.000016 | 0.0021 U | 6.4 | 22 UJ | -0.000065 | 0.0025 U | 0.0055 | 0.008 U | 0.0073 | 0.0095 UJ | 0.00010 | 0.01 U | 110 | 230 U | ND | 3.0 U |
| SP008 | Wooley Valley Mine Unit III Overburden Pon | 052101SWSP008 | E0100497 | 0.10 | | 0.0021 | 0.0025 UJ | 0.0062 | | -0.038 | 9.5 U | 0.000098 | 0.0021 U | 10 | 22 UJ | 0.00013 | 0.0025 U | 0.0067 | 0.008 U | 0.0017 | 0.0095 UJ | 0.00040 | 0.01 U | 52 | 230 U | 22 | |
| SP009 | Lanes Creek Mine Pond | 052101SWSP009 | E0100505 | 0.025 | | 0.011 | J | 0.013 | | 4.8 | 9.5 U | 0.0000050 | 0.0021 U | 2.2 | 22 UJ | 0.000069 | 0.0025 U | 0.00063 | 0.008 U | 0.0125 | J | 0.0024 | 0.01 U | 85 | 230 U | ND | 3.0 U |
| SP010 | Ballard Mine Dredge Ponc | 051501SWSP010 | E0100268 | 0.024 | | 0.046 | J | 0.031 | | 9.8 | | -0.0000081 | 0.0021 U | 12 | 22 UJ | 0.00017 | 0.0025 U | 0.059 | | 0.012 | J | 0.025 | J | 230 | 230 U | ND | 3.0 U |
| SP011 | Ballard Mine Upper Elk Ponc | 051501SWSP011 | E0100270 | 0.0036 | | 0.019 | J | 0.0091 | | 3.6 | 9.5 U | 0.000069 | 0.0021 U | 2.0 | 22 UJ | 0.00023 | 0.0025 U | 0.0011 | 0.008 U | 0.048 | J | 0.0078 | 0.01 U | 78 | 230 U | 9.0 | |
| SP012 | Ballard Mine Lower Elk Ponc | 051501SWSP012 | E0100269 | 0.0021 | | 0.025 | J | 0.0080 | | 2.3 | 9.5 U | 0.000065 | 0.0021 U | 1.2 | 22 UJ | 0.00023 | 0.0025 U | 0.0017 | 0.008 U | 0.04 | J | 0.010 | J | 80 | 230 U | ND | 3.0 U |
| SP014 | Henry Mine Henry Ponc | 051501SWSP014 | E0100274 | 0.017 | | 0.0040 | J | 0.0031 | 0.0033 U | 6.6 | 9.5 U | -0.000024 | 0.0021 U | 14 | 22 UJ | 0.000021 | 0.0025 U | 0.0029 | 0.008 U | 0.0023 | 0.0095 UJ | 0.0084 | 0.01 U | 110 | 230 U | ND | 3.0 U |
| SP015 | Henry Mine Smith Ponc | 051501SWSP015 | E0100275 | 0.18 | | 0.0072 | J | 0.0060 | | 3.1 | 9.5 U | -0.000024 | 0.0021 U | 9.6 | 22 UJ | 0.000036 | 0.0025 U | 0.0035 | 0.008 U | 0.0069 | 0.0095 UJ | 0.012 | J | 250 | | ND | 3.0 U |
| SP016 | Henry Mine Center Henry Ponc | 051501SWSP016 | E0100276 | 0.0077 | | 0.0020 | 0.0025 UJ | 0.0046 | | 1.8 | 9.5 U | -0.000025 | 0.0021 U | 9.6 | 22 UJ | 0.000034 | 0.0025 U | 0.0028 | 0.008 U | 0.0043 | 0.0095 UJ | 0.0099 | 0.01 U | 150 | 230 U | ND | 3.0 U |
| SP017 | Enoch Valley Mine South Ponc | 051401SWSP017 | E0100258 | 0.42 | | 0.0040 | J | 0.016 | | 3.4 | 9.5 U | -0.000018 | 0.0021 U | 9.7 | 22 UJ | 0.00011 | 0.0025 U | 0.011 | | 0.0027 | 0.0095 UJ | 0.019 | J | 110 | 230 U | ND | 3.0 U |
| SP018 | Enoch Valley Mine Keyhole Ponc | 051401SWSP018 | E0100259 | 3.4 | | 0.022 | J | 1.5 | | 2.8 | 9.5 U | 0.0000024 | 0.0021 U | 15 | 22 UJ | 0.0010 | 0.0025 U | 0.010 | | 0.061 | J | 6.6 | J | 130 | 230 U | ND | 3.0 U |
| SP019 | Enoch Valley Mine Bat Cave Ponc | 051401SWSP019 | E0100257 | -0.00090 | 0.002 U | 0.0086 | J | 0.011 | | 3.9 | 9.5 U | -0.0000036 | 0.0021 U | 4.7 | 22 UJ | 0.00014 | 0.0025 U | 0.0041 | 0.008 U | 0.019 | J | 0.0071 | 0.01 U | 30 | 230 U | 69 | |
| SP020 | Enoch Valley Mine West Ponc | 051401SWSP020 | E0100264 | 0.0085 | | 0.0047 | J | 0.011 | | 0.34 | 9.5 U | -0.000019 | 0.0021 U | 3.4 | 22 UJ | 0.000020 | 0.0025 U | 0.0018 | 0.008 U | 0.013 | J | 0.0059 | 0.01 U | 9.0 | 230 U | 34 | |
| SP021 | Enoch Valley Mine Stock Ponc | 051401SWSP021 | E0100263 | 0.00080 | 0.002 U | 0.015 | J | 0.069 | | 1.6 | 9.5 U | -0.000021 | 0.0021 U | 7.9 | 22 UJ | 0.00015 | 0.0025 U | 0.0084 | | 0.022 | J | 0.16 | J | 120 | 230 U | ND | 3.0 U |
| SP022 | Enoch Valley Mine Tipple Ponc | 051401SWSP022 | E0100265 | -0.0019 | 0.002 U | 0.0086 | J | 0.0032 | 0.0033 U | 2.4 | 9.5 U | -0.000016 | 0.0021 U | 9.4 | 22 UJ | 0.000051 | 0.0025 U | 0.0067 | 0.008 U | 0.024 | J | 0.0098 | 0.01 U | 56 | 230 U | 17 | |
| SP023 | Enoch Valley Mine Haul Road Ponc | 051401SWSP023 | E0100261 | -0.0033 | 0.002 U | 0.024 | J | 0.0027 | 0.0033 U | 3.5 | 9.5 U | -0.000015 | 0.0021 U | 5.3 | 22 UJ | 0.000062 | 0.0025 U | 0.011 | | 0.026 | J | 0.0074 | 0.01 U | 52 | 230 U | 4.0 | |
| SP025 | Gay Mine W Pit Pond | 051701SWSP025 | E0100461 | 0.020 | | 0.0058 | J | 0.0070 | | 19 | | 0.0000037 | 0.0021 U | 46 | J | -0.000048 | 0.0025 U | 0.0018 | 0.008 U | 0.00099 | 0.0095 UJ | 0.0030 | 0.01 U | 180 | 230 U | 22 | |
| SP026 | Gay Mine Z Pit Ponc | 051701SWSP026 | E0100463 | 0.012 | | 0.013 | J | 0.0079 | | 3.1 | 9.5 U | -0.000017 | 0.0021 U | 30 | J | -0.000030 | 0.0025 U | 0.0025 | 0.008 U | 0.0019 | 0.0095 UJ | 0.0036 | 0.01 U | 65 | 230 U | ND | 3.0 U |
| SP027 | Gay Mine South 40 Pit Ponc | 051601SWSP027 | E0100336 | 0.00053 | 0.002 U | 0.011 | J | 0.0046 | | 1.5 | 9.5 U | -0.000015 | 0.0021 U | 41 | J | 0.00010 | 0.0025 U | 0.0048 | 0.008 U | 0.019 | J | 0.0066 | 0.01 U | 100 | 230 U | 4.4 | |
| SP030 | Conda Mine Dredge Ponc | 052201SWSP030 | E0100585 | 0.043 | | 0.00075 | 0.0025 UJ | 0.00075 | 0.0033 U | 1.9 | 9.5 U | -0.00033 | 0.0021 U | 5.4 | 22 UJ | 0.000037 | 0.0025 U | 0.00079 | 0.008 U | 0.002933333 | 0.0095 UJ | -0.00092 | 0.01 U | 81 | 230 U | 22 | |
| SP031 | Enoch Valley Mine Shop Ponc | 051401SWSP031 | E0100260 | 0.036 | | 0.0093 | J | 0.022 | | 6.9 | 9.5 U | -0.000016 | 0.0021 U | 90 | J | 0.00011 | 0.0025 U | 0.0021 | 0.008 U | 0.0079 | 0.0095 UJ | 0.025 | J | 73 | 230 U | 17 | |
| SP032 | Wooley Valley Mine Large Haul Road Ponc | 051801SWSP032 | E0100449 | 0.15 | | 0.0025 | 0.0025 UJ | 0.0065 | | 1.4 | 9.5 U | 0.000067 | 0.0021 U | 18 | 22 UJ | 0.000028 | 0.0025 U | 0.0029 | 0.008 U | -0.00018 | 0.0095 UJ | 0.0099 | 0.01 U | 100 | 230 U | ND | 3.0 U |
| SP033 | Wooley Valley Mine Upper Angus Creek Reservoi | 051901SWSP033 | E0100450 | 0.077 | | 0.00076 | 0.0025 UJ | 0.0022 | 0.0033 U | 1.3 | 9.5 U | 0.00000017 | 0.0021 U | 8.5 | 22 UJ | -0.000061 | 0.0025 U | 0.0025 | 0.008 U | -0.00067 | 0.0095 UJ | 0.0088 | 0.01 U | 170 | 230 U | ND | 3.0 U |
| SP034 | Cond Mine Hoorah Hollow Ponc | 052301SWSP034 | E0100582 | -0.0013 | 0.002 U | 0.00060 | 0.0025 UJ | 0.00081 | 0.0033 U | 0.12 | 9.5 U | -0.00015 | 0.0021 U | 7.1 | 22 UJ | 0.00031 | 0.0025 U | 0.00087 | 0.008 U | 0.0036 | 0.0095 UJ | 0.00020 | 0.01 U | 180 | 230 U | ND | 3.0 U |
| SP035 | Conda Mine NL4 Ponc | 052301SWSP035 | E0100584 | -0.0027 | 0.002 U | 0.050 | J | 0.016 | | 2.0 | 9.5 U | -0.00029 | 0.0021 U | 3.2 | 22 UJ | 0.00048 | 0.0025 U | 0.0060 | 0.008 U | 0.11 | J | 0.012 | J | 65 | 230 U | ND | 3.0 U |
| SP036 | Gay Mine Pond #1 above A-12 Pi | 051601SWSP036 | E0100334 | 1.2 | | 0.0050 | J | 0.0032 | 0.0033 U | 4.0 | 9.5 U | -0.0000041 | 0.0021 U | 100 | J | 0.000054 | 0.0025 U | 0.0025 | 0.008 U | 0.0029 | 0.0095 UJ | 0.0093 | 0.01 U | 160 | 230 U | ND | 3.0 U |
| SP037 | Gay Mine Pond #2 above A-12 Pi | 051601SWSP037 | E0100335 | 0.49 | | 0.0055 | J | 0.0032 | 0.0033 U | 4.15 | 9.5 U | -0.000013 | 0.0021 U | 85 | J | 0.0000041 | 0.0025 U | 0.0029 | 0.008 U | 0.0022 | 0.0095 UJ | 0.0098 | 0.01 U | 140 | 230 U | ND | 3.0 U |
| SP038 | Gay Mine A-12 Lake in A-12 Pi | 051601SWSP038 | E0100333 | 0.00090 | 0.002 U | 0.029 | J | 0.0098 | | 2.6 | 9.5 U | 0.000064 | 0.0021 U | 80 | J | 0.00040 | 0.0025 U | 0.0087 | | 0.014 | J | 0.013 | J | 71 | 230 U | 9.0 | |
| SP041 | Gay Mine East Limb North Ponc | 051701SWSP041 | E0100462 | 0.082 | | 0.0010 | 0.0025 UJ | 0.0031 | 0.0033 U | 5.0 | 9.5 U | -0.000010 | 0.0021 U | 49 | J | -0.000089 | 0.0025 U | 0.00076 | 0.008 U | 0.000017 | 0.0095 UJ | 0.0070 | 0.01 U | 150 | 230 U | ND | 3.0 U |
| SP044 | North Maybe Mine Pit Ponc | 051801SWSP044 | E0100455 | -0.00020 | 0.002 U | 0.027 | J | 0.0059 | | 0.38 | 9.5 U | 0.000021 | 0.0021 U | 0.032 | 22 UJ | 0.00010 | 0.0025 U | 0.0026 | 0.008 U | 0.17 | J | 0.0052 | 0.01 U | 58 | 230 U | 9.0 | |
| SP045 | Champ Mine Pit Ponc | 051601SWSP045 | E0100344 | 0.0056 | | 0.042 | J | 0.049 | | 1.5 | 9.5 U | -0.000011 | 0.0021 U | 10 | 22 UJ | 0.000074 | 0.0025 U | 0.0049 | 0.008 U | 0.017666667 | J | 0.066 | J | 110 | 230 U | ND | 3.0 U |
| SP046 | Champ Mine Extension Pit Ponc | 051601SWSP046 | E0100341 | -0.0015 | 0.002 U | 0.0041 | J | 0.0036 | | 0.60 | 9.5 U | 0.000074 | 0.0021 U | 4.2 | 22 UJ | 0.00022 | 0.0025 U | 0.00092 | 0.008 U | 0.012 | J | 0.0018 | 0.01 U | 63 | 230 U | ND | 3.0 U |
| SP047 | Mountain Fuel Mine North Pit Ponc | 051801SWSP047 | E0100456 | 0.077 | | 0.029 | J | 0.057 | | 0.89 | 9.5 U | 0.0000042 | 0.0021 U | 2.6 | 22 UJ | 0.000090 | 0.0025 U | 0.0018 | 0.008 U | 0.036 | J | 0.077 | J | 81 | 230 U | ND | 3.0 U |
| SP048 | Mountain Fuel Mine East Limb Pit Ponc | 051701SWSP048 | E0100365 | 0.054 | | 0.023 | J | 0.034 | | 1.2 | 9.5 U | -0.000011 | 0.0021 U | 7.3 | 22 UJ | 0.00032 | 0.0025 U | 0.0050 | 0.008 U | 0.072 | J | 0.058 | J | 91 | 230 U | ND | 3.0 U |
| SP050 | Wooley Valley Mine Unit III Pit Pond (South | 052101SWSP050 | E0100495 | -0.0028 | 0.002 U | 0.00077 | 0.0025 UJ | 0.0014 | 0.0033 U | 0.59 | 9.5 U | -0.000014 | 0.0021 U | 2.7 | 22 UJ | -0.000077 | 0.0025 U | 0.00093 | 0.008 U | 0.00044 | 0.0095 UJ | -0.0021 | 0.01 U | 46 | 230 U | ND | 3.0 U |
| SP051 | Wooley Valley Mine Unit III Pit Pond (North | 052101SWSP051 | E0100500 | -0.0013 | 0.002 U | 0.0016 | 0.0025 UJ | 0.0011 | 0.0033 U | 0.53 | 9.5 U | -0.0000078 | 0.0021 U | 0.86 | 22 UJ | 0.000069 | 0.0025 U | 0.0020 | 0.008 U | 0.003 | 0.0095 UJ | -0.00078 | 0.01 U | 52 | 230 U | 14 | |
| SP054 | Smoky Canyon Mine A Pit Ponc | 052201SWSP054 | E0100592 | -0.0022 | 0.002 U | 0.046 | J | 0.0085 | | 1.3 | 9.5 U | -0.00024 | 0.0021 U | 6.4 | 22 UJ | 0.00020 | 0.0025 U | 0.0038 | 0.008 U | 0.0225 | J | 0.0033 | 0.01 U | 54 | 230 U | 4.0 | |
| SP055 | Henry Mine South Pit Ponc | 051401SWSP055 | E0100262 | -0.0033 | 0.002 U | 0.036 | J | 0.96 | | 1.0 | 9.5 U | -0.0000083 | 0.0021 U | 5.6 | 22 UJ | 0.00044 | 0.0025 U | 0.0030 | 0.008 U | 0.038 | J | 4.0 | J | 140 | 230 U | ND | 3.0 U |
| SP059 | Ballard Mine Pit #4 Stock Ponc | 051501SWSP059 | E0100271 | 0.0045 | | 0.0090 | J | 0.0098 | | 2.9 | 9.5 U | 0.0000039 | 0.0021 U | 1.6 | 22 UJ | 0.000062 | 0.0025 U | 0.00028 | 0.008 U | 0.0078 | 0.0095 UJ | 0.0091 | 0.01 U | 60 | 230 U | ND | 3.0 U |
| SP060 | Rasmussen Ridge Mine Unit I Overburden Runoff Pond # | 051801SWSP060 | E0100464 | 1.1 | | 0.0010 | 0.0025 UJ | 0.058 | | 2.9 | 9.5 U | -0.000016 | 0.0021 U | 22 | 22 UJ | -0.000050 | 0.0025 U | 0.0021 | 0.008 U | -0.001 | 0.0095 UJ | 0.10 | J | 120 | 230 U | ND | 3.0 U |
| SP061 | Dry Valley Mine Pit B Ponc | 052101SWSP061 | E0100498 | 0.018 | | 0.031 | J | 0.22 | | 0.89 | 9.5 U | 0.000014 | 0.0021 U | 7.8 | 22 UJ | 0.00024 | 0.0025 U | 0.0015 | 0.008 U | 0.027 | J | 0.83 | J | 110 | 230 U | ND | 3.0 U |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analys
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation proc
Data qualifier definitions are
(U) - The material was analyzed for, but was not detected. The value preceeding the U indicates the value below which results are considered undetect
(J) - The sample result is an estimated quantity
(R) - The data are unusable
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise. The value preceeding the UJ indicates the value below which results are considered undete
na: Not available
ND: Not detected

**APPENDIX D**
**SPRING 2001 AREA-WIDE INVESTIGATION SURFACE WATER DATA RESULTS**

| Station ID | Facility Name | MWH ID | UI Sample ID | Chloride mg/L | Flag | Fluoride mg/L | Flag | Hydroxide Alkalinity mg $CaCO_3$/L | Flag | pH | Flag | Sulfate mg/L | Flag | Total Alkalinity mg $CaCO_3$/L | Flag | Selenium mg/L | Flag | Mercury mg/L | Flag | Nitrate-N+Nitrite-N mg/L | Flag | Total Phosphorus mg/L | Flag | Filterable Residue mg/L | Flag | Non-Filterable Res. mg/L | Flag | TOC mg/L | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DS005 | North Maybe Mine East Mill Dump Seep | 051601SWDS005 | E0100343 | 3.4 | 12 U | 0.30 | | ND | 3.0 U | 7.6 | | 150 | J | 200 | 230 U | 0.49 | J | 0.000013 | 0.0005 U | 3.8 | J | 0.20 | 0.95 U | 500 | | 2.0 | 4.0 U | 2.2 | 49 U |
| DS006 | Champ Mine Goodheart Creek Seep | 051601SWDS006 | E0100342 | 6.2 | 12 U | 0.70 | | ND | 3.0 U | 8.1 | | 650 | J | 290 | | 0.041 | J | 0.0000030 | 0.0005 U | 0.061 | 2.1 U | 0.089 | 0.95 U | 1300 | | 7.0 | J | 7.1 | 49 U |
| DS007 | Mountain Fuel Mine Seep #1 | 051901SWDS007 | E0100459 | 5.1 | 12 U | 0.14 | | ND | 3.0 U | 7.9 | | 200 | J | 220 | 230 U | 0.012 | J | -0.0000070 | 0.0005 UJ | 0.022 | 2.1 U | 0.043 | 0.95 U | 580 | | 1.0 | 4.0 U | na | |
| DS008 | Mountain Fuel Mine Seep #2 | 051801SWDS008 | E0100457 | 4.0 | 12 U | 0.14 | | ND | 3.0 U | 8.5 | | 18 | J | 220 | 230 U | 0.00045 | 0.001UJ | -0.000026 | 0.0005 UJ | 0.00096 | 2.1 U | 0.015 | 0.95 U | 260 | | 1.0 | 4.0 U | 7.8 | 49 U |
| DS009 | Rasmussen Ridge Mine Unit I Overburden Dump Seep | 051801SWDS009 | E0100465 | 24 | | 1.7 | | ND | 3.0 U | 7.4 | | 1700 | J | 170 | 230 U | 0.078 | J | -0.000021 | 0.0005 UJ | 0.033 | 2.1 U | 0.071 | 0.95 U | 2800 | | 280 | J | 6.8 | 49 U |
| DS010 | Wooley Valley Mine Unit I Overburden Dump Seep | 051901SWDS010 | E0100460 | 5.1 | 12 U | 0.063 | 0.1 U | ND | 3.0 U | 7.9 | | 160 | J | 250 | | 0.013 | J | -0.000015 | 0.0005 UJ | 0.27 | 2.1 UJ | 0.26 | 0.95 U | 530 | | 33 | J | 4.6 | 49 U |
| DS011 | Wooley Valley Mine Unit III Overburden Dump Seep | 052101SWDS011 | E0100499 | 5.2 | 12 U | 0.47 | | ND | 3.0 U | 7.6 | | 160 | J | 300 | | 0.0065 | J | 0.000063 | 0.0005 UJ | 0.027 | 2.1 U | 0.63 | 0.95 U | 570 | | 61 | J | 11 | 49 U |
| DS012 | Wooley Valley Mine Unit IV Overburden Dump Seep | 052101SWDS012 | E0100496 | 3.0 | 12 U | 0.65 | | ND | 3.0 U | 6.7 | | 97 | J | 340 | | 0.0028 | J | -0.000022 | 0.0005 UJ | -0.031 | 2.1 U | 0.017 | 0.95 U | 1800 | | 72 | J | na | |
| DS015 | Conda Mine Waste Dump South Woodall Seep | 052201SWDS015 | E0100561 | 6.9 | 12 U | 3.1 | | ND | 3.0 U | 8.0 | | 2000 | J | 210 | 230 U | 1.8 | J | -0.000028 | 0.0005 UJ | 1.4 | 2.1 UJ | 0.25 | 0.95 U | 3100 | | 2.3 | 4.0 U | 3.0 | 49 U |
| DS017 | Conda Mine Meadow Dump Seep | 052301SWDS017 | E0100581 | 9.0 | 12 U | 0.12 | | ND | 3.0 U | 7.4 | | 160 | J | 210 | 230 U | 0.0041 | J | -0.000032 | 0.0005 UJ | 0.15 | 2.1 UJ | 0.044 | 0.95 U | 440 | | 3.0 | 4.0 U | 3.6 | 49 U |
| DS018 | Conda Mine Dump Seep #4 | 052201SWDS018 | E0100559 | 5.0 | 12 U | 1.0 | | ND | 3.0 U | 8.0 | | 990 | J | 390 | | 0.42 | J | -0.000018 | 0.0005 UJ | 0.027 | 2.1 U | 0.15 | 0.95 U | 1900 | | 68 | J | 4.2 | 49 U |
| DS019 | Conda Mine Dump Seep #7 | 052301SWDS019 | E0100580 | 4.3 | 12 U | 1.4 | | ND | 3.0 U | 7.6 | | 1400 | J | 290 | | 2.2 | J | 0.000030 | 0.0005 UJ | 0.032 | 2.1 U | 1.4 | | 2300 | | 88 | J | 7.7 | 49 U |
| DS020 | Mountain Fuel New Spring #1 | 051901SWDS020 | E0100458 | 9.9 | 12 U | 0.59 | | ND | 3.0 U | 7.7 | | 620 | J | 350 | | 0.34 | J | -0.000010 | 0.0005 UJ | 0.080 | 2.1 U | 0.26 | 0.95 U | 1400 | | 4.0 | 4.0 U | 9.6 | 49 U |
| DS021 | Conda Mine French Drain | 052301SWDS021 | E0100583 | 6.7 | 12 U | 0.39 | | ND | 3.0 U | 7.7 | | 290 | J | 340 | | 0.088 | J | -0.000015 | 0.0005 UJ | 0.058 | 2.1 U | 0.11 | 0.95 U | 760 | | 6.0 | J | 5.7 | 49 U |
| DS022 | Henry Mine South Pit Overburden Dump Limestone Drai | 051501SWDS022 | E0100273 | 3.3 | 12 U | 0.17 | | ND | 3.0 U | 8.0 | | 76 | J | 410 | | 0.00071 | 0.001UJ | 0.0000020 | 0.0005 U | -0.014 | 2.1 U | 0.037 | 0.95 U | 530 | | 39 | J | 19 | 49 U |
| DS023 | Conda Mine Dump Seep #2 | 052201SWDS023 | E0100560 | 2.7 | 12 U | 0.43 | | ND | 3.0 U | 7.5 | | 600 | J | 34 | 230 U | 0.023 | J | -0.000027 | 0.0005 UJ | 0.23 | 2.1 UJ | 0.051 | 0.95 U | 960 | | 1.0 | 4.0 U | 12 | 49 U |
| DS024 | Conda Mine Dump Seep #3 | 052301SWDS024 | E0100579 | 3.1 | 12 U | NA | | ND | 3.0 U | 7.0 | | 1500 | J | 320 | | 0.067 | J | 0.00014 | 0.0005 UJ | 0.45 | 2.1 UJ | 0.92 | 0.95 U | 2400 | | 73 | J | 5.3 | 49 U |
| DS025 | Enoch Valley Mine West Dump Seep | 051501SWDS025 | E0100272 | 5.0 | 12 U | 0.51 | | ND | 3.0 U | 7.2 | | 700 | J | 200 | 230 U | 0.0026 | J | 0.000012 | 0.0005 U | -0.055 | 2.1 U | 1.7 | | 1300 | | 130 | J | 12 | 49 U |
| DS026 | Enoch Valley Mine South Dump Seep | 051401SWDS026 | E0100266 | 7.4 | 12 U | 0.40 | | ND | 3.0 U | 7.9 | | 650 | J | 320 | | 0.049 | J | 0.000012 | 0.0005 U | 0.18 | 2.1 UJ | 0.27 | 0.95 U | 1300 | | 11 | J | 12 | 49 U |
| DS027 | Ballard Mine Garden Hose Seep | 051501SWDS027 | E0100267 | 5.7 | 12 U | 0.093 | 0.1 U | ND | 3.0 U | 8.2 | | 160 | J | 270 | | 0.44 | J | 0.000012 | 0.0005 U | 5.0 | J | 0.031 | 0.95 U | 520 | | 3.0 | 4.0 U | 7.6 | 49 U |
| DS028 | Smoky Canyon Mine Dump Seep DP-10 | 052201SWDS028 | E0100591 | 300 | | 0.51 | | ND | 3.0 U | 7.8 | | 310 | J | 72 | 230 U | 0.53 | J | -0.000019 | 0.0005 UJ | 3.8 | J | 0.21 | 0.95 U | 1300 | | 9.0 | J | 2.8 | 49 U |
| DS029 | Smoky Canyon Mine Dump Seep DP-7 | 052201SWDS029 | E0100590 | 29 | | 0.35 | | ND | 3.0 U | 7.5 | | 930 | J | 350 | | 0.86 | J | -0.000029 | 0.0005 UJ | 1.9 | 2.1 UJ | 0.13 | 0.95 U | 1800 | | 5.5 | J | 5.7 | 49 U |
| SP003 | Mountain Fuel Stock Pond | 051701SWSP003 | E0100368 | 4.5 | 12 U | 0.32 | | ND | 3.0 U | 9.3 | | 410 | J | 89 | 230 U | 0.0066 | J | 0.0000033 | 0.0005 U | 0.0026 | 2.1 U | 0.29 | 0.95 U | 690 | | 7.3 | J | 7.8 | 49 U |
| SP004 | Mountain Fuel Mine Spring #2 | 051701SWSP004 | E0100367 | 1.3 | 12 U | 0.49 | | ND | 3.0 U | 8.4 | | 350 | J | 100 | 230 U | 0.026 | J | 0.0000030 | 0.0005 U | 0.056 | 2.1 U | 0.18 | 0.95 U | 700 | | 1.0 | 4.0 U | 6.5 | 49 U |
| SP005 | Mountain Fuel Mine Spring #3 | 051701SWSP005 | E0100366 | 1.2 | 12 U | 0.31 | | ND | 3.0 U | 8.3 | | 69 | J | 91 | 230 U | 0.0037 | J | 0.0000010 | 0.0005 U | 0.071 | 2.1 U | 0.096 | 0.95 U | 310 | | 3.0 | 4.0 U | 9.6 | 49 U |
| SP007 | Wooley Valley Mine Unit III Shop Pond | 052101SWSP007 | E0100494 | 4.4 | 12 U | 0.27 | | ND | 3.0 U | 8.0 | | 26 | J | 110 | 230 U | 0.0067 | J | -0.000020 | 0.0005 UJ | -0.0012 | 2.1 U | 0.25 | 0.95 U | 200 | | 6.0 | J | 9.9 | 49 U |
| SP008 | Wooley Valley Mine Unit III Overburden Pond | 052101SWSP008 | E0100497 | 28 | | 0.14 | | ND | 3.0 U | 8.9 | | 210 | J | 74 | 230 U | 0.0004 | 0.001UJ | -0.000018 | 0.0005 UJ | 0.019 | 2.1 U | 0.017 | 0.95 U | 460 | | -1.0 | 4.0 U | 5.6 | 49 U |
| SP009 | Lanes Creek Mine Pond | 052101SWSP009 | E0100505 | 1.8 | 12 U | 0.34 | | ND | 3.0 U | 7.8 | | 11 | J | 85 | 230 U | 0.053 | J | 0.0000030 | 0.0005 UJ | 2.4 | J | 0.53 | 0.95 U | 100 | | 10 | J | 8.0 | 49 U |
| SP010 | Ballard Mine Dredge Pond | 051501SWSP010 | E0100268 | 3.1 | 12 U | 0.92 | | ND | 3.0 U | 8.0 | | 630 | J | 230 | 230 U | 0.58 | J | 0.000012 | 0.0005 U | -0.0071 | 2.1 U | 0.18 | 0.95 U | 1200 | | 10 | J | 10 | 49 U |
| SP011 | Ballard Mine Upper Elk Pond | 051501SWSP011 | E0100270 | 0.99 | 12 U | 0.35 | | ND | 3.0 U | 8.4 | | 13 | J | 86 | 230 U | 0.094 | J | 0.0000090 | 0.0005 U | 0.30 | 2.1 UJ | 0.098 | 0.95 U | 150 | | 7.0 | J | 9.4 | 49 U |
| SP012 | Ballard Mine Lower Elk Pond | 051501SWSP012 | E0100269 | 1.1 | 12 U | 0.37 | | ND | 3.0 U | 8.2 | | 42 | J | 80 | 230 U | 0.22 | J | 0.0000080 | 0.0005 U | 0.12 | 2.1 UJ | 0.038 | 0.95 U | 160 | | 6.5 | J | 6.9 | 49 U |
| SP014 | Henry Mine Henry Pond | 051501SWSP014 | E0100274 | 5.1 | 12 U | 0.51 | | ND | 3.0 U | 8.1 | | 430 | J | 110 | 230 U | 0.0042 | J | ND | | -0.0029 | 2.1 U | 0.054 | 0.95 U | 700 | | 3.0 | 4.0 U | 14 | 49 U |
| SP015 | Henry Mine Smith Pond | 051501SWSP015 | E0100275 | 4.9 | 12 U | 0.46 | | ND | 3.0 U | 8.2 | | 500 | J | 250 | | 0.13 | J | 0.0000020 | 0.0005 U | 0.030 | 2.1 U | 0.13 | 0.95 U | 680 | | 6.0 | J | 8.4 | 49 U |
| SP016 | Henry Mine Center Henry Pond | 051501SWSP016 | E0100276 | 6.5 | 12 U | 0.15 | | ND | 3.0 U | 8.0 | | 230 | J | 150 | 230 U | 0.060 | J | 0.00000050 | 0.0005 U | 0.052 | 2.1 U | 0.074 | 0.95 U | 510 | | 8.5 | J | 5.1 | 49 U |
| SP017 | Enoch Valley Mine South Pond | 051401SWSP017 | E0100258 | 49 | | 0.48 | | ND | 3.0 U | 7.9 | | 700 | J | 110 | 230 U | 0.22 | J | 0.000010 | 0.0005 U | 0.14 | 2.1 UJ | 0.10 | 0.95 U | 1200 | | 5.0 | J | 9.7 | 49 U |
| SP018 | Enoch Valley Mine Keyhole Pond | 051401SWSP018 | E0100259 | 3.8 | 12 U | 3.8 | | ND | 3.0 U | 7.7 | | 1500 | J | 130 | 230 U | 0.20 | J | 0.0000090 | 0.0005 U | 0.073 | 2.1 U | 0.10 | 0.95 U | 2100 | | 4.0 | 4.0 U | 7.4 | 49 U |
| SP019 | Enoch Valley Mine Bat Cave Pond | 051401SWSP019 | E0100257 | 3.6 | 12 U | 0.35 | | ND | 3.0 U | 9.5 | | 220 | J | 99 | 230 U | 0.025 | J | 0.000020 | 0.0005 U | 0.050 | 2.1 U | 0.18 | 0.95 U | 430 | | 6.0 | J | 8.4 | 49 U |
| SP020 | Enoch Valley Mine West Pond | 051401SWSP020 | E0100264 | 3.5 | 12 U | 0.33 | | ND | 3.0 U | 10.0 | | 280 | J | 43 | 230 U | 0.037 | J | 0.0000030 | 0.0005 U | 0.0014 | 2.1 U | 0.12 | 0.95 U | 280 | | 6.0 | J | 8.4 | 49 U |
| SP021 | Enoch Valley Mine Stock Pond | 051401SWSP021 | E0100263 | 29 | | 0.81 | | ND | 3.0 U | 8.1 | | 480 | J | 120 | 230 U | 0.11 | J | 0.0000040 | 0.0005 U | 0.0020 | 2.1 U | 0.20 | 0.95 U | 850 | | 3.0 | 4.0 U | 8.0 | 49 U |
| SP022 | Enoch Valley Mine Tipple Pond | 051401SWSP022 | E0100265 | 140 | | 3.1 | | ND | 3.0 U | 8.8 | | 320 | J | 73 | 230 U | 0.040 | J | 0.0000060 | 0.0005 U | 0.013 | 2.1 U | 0.22 | 0.95 U | 710 | | 19 | J | 6.7 | 49 U |
| SP023 | Enoch Valley Mine Haul Road Pond | 051401SWSP023 | E0100261 | 210 | | 2.6 | | ND | 3.0 U | 8.7 | | 160 | J | 56 | 230 U | 0.024 | J | 0.0000050 | 0.0005 U | -0.00017 | 2.1 U | 0.42 | 0.95 U | 800 | | 10 | J | 5.8 | 49 U |
| SP025 | Gay Mine W Pit Pond | 051701SWSP025 | E0100461 | 17 | | 0.45 | | ND | 3.0 U | 8.8 | | 150 | J | 200 | 230 U | 0.00047 | 0.001UJ | -0.000020 | 0.0005 UJ | 0.058 | 2.1 U | 0.31 | 0.95 U | 240 | | 36 | J | na | |
| SP026 | Gay Mine Z Pit Pond | 051701SWSP026 | E0100463 | 46 | | 0.32 | | ND | 3.0 U | 8.2 | | 94 | J | 65 | 230 U | 0.0031 | J | -0.000021 | 0.0005 UJ | 0.0041 | 2.1 U | 0.11 | 0.95 U | 200 | | 21 | J | na | |
| SP027 | Gay Mine South 40 Pit Pond | 051601SWSP027 | E0100336 | 130 | | 0.40 | | ND | 3.0 U | 8.4 | | 76 | J | 100 | 230 U | 0.033 | J | 0.0000023 | 0.0005 U | 0.040 | 2.1 U | 0.21 | 0.95 U | 450 | | 15 | J | 2.8 | 49 U |
| SP030 | Conda Mine Dredge Pond | 052201SWSP030 | E0100585 | 4.9 | 12 U | 0.22 | | ND | 3.0 U | 9.1 | | 11 | J | 100 | 230 U | 0.0079 | J | -0.000028 | 0.0005 UJ | -0.025 | 2.1 U | 0.18 | 0.95 U | 100 | | 12 | J | 10 | 49 U |
| SP031 | Enoch Valley Mine Shop Pond | 051401SWSP031 | E0100260 | 210 | | 0.81 | | ND | 3.0 U | 8.7 | | 120 | J | 91 | 230 U | 0.0025 | J | 0.0000070 | 0.0005 U | 0.0044 | 2.1 U | 0.089 | 0.95 U | 620 | | 5.0 | J | 16 | 49 U |
| SP032 | Wooley Valley Mine Large Haul Road Pond | 051801SWSP032 | E0100449 | 91 | | 0.31 | | ND | 3.0 U | 8.2 | | 260 | J | 100 | 230 U | 0.0074 | J | -0.0000030 | 0.0005 UJ | 0.0080 | 2.1 U | 0.067 | 0.95 U | 740 | | 14 | J | na | |
| SP033 | Wooley Valley Mine Upper Angus Creek Reservoi | 051901SWSP033 | E0100450 | 2.4 | 12 U | 0.085 | 0.1 U | ND | 3.0 U | 7.9 | | 260 | J | 170 | 230 U | 0.0021 | J | -0.000022 | 0.0005 UJ | 0.14 | 2.1 UJ | 0.061 | 0.95 U | 600 | | 8.2 | | 5.9 | 49 U |
| SP034 | Cond Mine Hoorah Hollow Pond | 052301SWSP034 | E0100582 | 4.9 | 12 U | 0.12 | | ND | 3.0 U | 8.3 | | 19 | J | 180 | 230 U | 0.0014 | J | -0.000029 | 0.0005 UJ | 1.2 | 2.1 UJ | 0.030 | 0.95 U | 200 | | 3.0 | 4.0 U | 2.6 | 49 U |
| SP035 | Conda Mine NL4 Pond | 052301SWSP035 | E0100584 | 1.1 | 12 U | 0.73 | | ND | 3.0 U | 8.0 | | 210 | J | 65 | 230 U | 0.096 | J | -0.000043 | 0.0005 UJ | -0.00078 | 2.1 U | 0.19 | 0.95 U | 370 | | 4.0 | 4.0 U | 2.8 | 49 U |
| SP036 | Gay Mine Pond #1 above A-12 Pit | 051601SWSP036 | E0100334 | 310 | | 0.44 | | ND | 3.0 U | 8.1 | | 160 | J | 160 | 230 U | 0.0013 | J | -0.0000050 | 0.0005 U | 0.045 | 2.1 U | 0.074 | 0.95 U | 1000 | | 9.0 | J | 9.4 | 49 U |
| SP037 | Gay Mine Pond #2 above A-12 Pit | 051601SWSP037 | E0100335 | 290 | | 0.38 | | ND | 3.0 U | 8.2 | | 210 | J | 140 | 230 U | 0.00098 | 0.001UJ | 0.0000020 | 0.0005 U | 0.074 | 2.1 U | 0.054 | 0.95 U | 1000 | | 5.0 | J | 7.1 | 49 U |
| SP038 | Gay Mine A-12 Lake in A-12 Pit | 051601SWSP038 | E0100333 | 260 | | 0.65 | | ND | 3.0 U | 8.4 | | 250 | J | 80 | 230 U | 0.062 | J | 0.000010 | 0.0005 U | 0.029 | 2.1 U | 0.016 | 0.95 U | 920 | | 7.0 | J | 4.2 | 49 U |
| SP041 | Gay Mine East Limb North Pond | 051701SWSP041 | E0100462 | 150 | | 0.097 | 0.1 U | ND | 3.0 U | 7.8 | | 87 | J | 150 | 230 U | 0.00021 | 0.001UJ | -0.000029 | 0.0005 UJ | 0.10 | 2.1 U | 0.040 | 0.95 U | 260 | | 41 | J | na | |
| SP044 | North Maybe Mine Pit Pond | 051801SWSP044 | E0100455 | 0.43 | 12 U | 0.88 | | ND | 3.0 U | 9.1 | | 67 | J | 67 | 230 U | 0.17 | J | -0.000023 | 0.0005 UJ | 0.54 | 2.1 UJ | 0.14 | 0.95 U | 190 | | 3.0 | 4.0 U | 2.7 | 49 U |
| SP045 | Champ Mine Pit Pond | 051601SWSP045 | E0100344 | 6.6 | 12 U | 0.66 | | ND | 3.0 U | 7.0 | | 440 | J | 73 | 230 U | 0.020 | J | 0.0000020 | 0.0005 U | 0.031 | 2.1 U | 0.11 | 0.95 U | 820 | | 3.7 | 4.0 U | 2.3 | 49 U |
| SP046 | Champ Mine Extension Pit Pond | 051601SWSP046 | E0100341 | 2.6 | 12 U | 0.18 | | ND | 3.0 U | 7.9 | | 22 | J | 63 | 230 U | 0.010 | J | 0.0000090 | 0.0005 U | 0.79 | 2.1 UJ | 0.14 | 0.95 U | 89 | | 2.0 | 4.0 U | 2.5 | 49 U |
| SP047 | Mountain Fuel Mine North Pit Pond | 051801SWSP047 | E0100456 | 1.3 | 12 U | 0.93 | | ND | 3.0 U | 8.3 | | 180 | J | 81 | 230 U | 0.011 | J | -0.000010 | 0.0005 UJ | 0.18 | 2.1 UJ | 0.13 | 0.95 U | 360 | | 5.0 | J | 2.8 | 49 U |
| SP048 | Mountain Fuel Mine East Limb Pit Pond | 051701SWSP048 | E0100365 | 4.3 | 12 U | 0.62 | | ND | 3.0 U | 8.1 | | 370 | J | 91 | 230 U | 0.069 | J | 0.0000090 | 0.0005 U | 0.018 | 2.1 U | 0.17 | 0.95 U | 660 | | 8.0 | J | 2.2 | 49 U |
| SP050 | Wooley Valley Mine Unit III Pit Pond (South | 052101SWSP050 | E0100495 | 2.0 | 12 U | 0.21 | | ND | 3.0 U | 8.2 | | 34 | J | 46 | 230 U | 0.056 | J | -0.0000090 | 0.0005 UJ | 0.036 | 2.1 U | 0.32 | 0.95 U | 150 | | 39 | J | 3.4 | 49 U |
| SP051 | Wooley Valley Mine Unit III Pit Pond (North | 052101SWSP051 | E0100500 | 1.0 | 12 U | 0.24 | | ND | 3.0 U | 8.7 | | 25 | J | 66 | 230 U | 0.015 | J | -0.000019 | 0.0005 UJ | 0.074 | 2.1 U | 0.083 | 0.95 U | 99 | | 8.0 | J | 2.9 | 49 U |
| SP054 | Smoky Canyon Mine A Pit Pond | 052201SWSP054 | E0100592 | 23 | | 0.41 | | ND | 3.0 U | 8.5 | | 60 | J | 58 | 230 U | 0.085 | J | -0.000039 | 0.0005 UJ | -0.018 | 2.1 U | 0.43 | 0.95 U | 220 | | 12 | J | 2.1 | 49 U |
| SP055 | Henry Mine South Pit Pond | 051401SWSP055 | E0100262 | 1.7 | 12 U | 1.0 | | ND | 3.0 U | 8.0 | | 700 | J | 140 | 230 U | 0.67 | J | 0.0000030 | 0.0005 U | 0.0094 | 2.1 U | 0.30 | 0.95 U | 1200 | | 10 | J | 5.0 | 49 U |
| SP059 | Ballard Mine Pit #4 Stock Pond | 051501SWSP059 | E0100271 | 1.5 | 12 U | 0.53 | | ND | 3.0 U | 7.6 | | 13 | J | 60 | 230 U | 0.024 | J | 0.00026 | 0.0005 U | 0.077 | 2.1 U | 3.3 | | 320 | | 180 | J | 3.2 | 49 U |
| SP060 | Rasmussen Ridge Mine Unit I Overburden Runoff Pond #4 | 051801SWSP060 | E0100464 | 18 | | NA | | ND | 3.0 U | 7.7 | | 1800 | J | 120 | 230 U | 0.044 | J | -0.000026 | 0.0005 UJ | 0.42 | 2.1 UJ | 0.041 | 0.95 U | 2600 | | 300 | J | 6.7 | 49 U |
| SP061 | Dry Valley Mine Pit B Pond | 052101SWSP061 | E0100498 | 9.9 | 12 U | 0.36 | | ND | 3.0 U | 8.0 | | 190 | J | 110 | 230 U | 0.16 | J | -0.000027 | 0.0005 UJ | 2.4 | J | 0.078 | 0.95 U | 460 | | 3.0 | 4.0 U | 1.0 | 49 U |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analys
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation proce
Data qualifier definitions are
(U) - The material was analyzed for, but was not detected. The value preceeding the U indicates the value below which results are considered undetect
(J) - The sample result is an estimated quantity
(R) - The data are unusable
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise. The value preceeding the UJ indicates the value below which results are considered undete
na: Not available
ND: Not detected

# Appendix E
# Validated Soil Data

## Appendix E- Spring 2001 Area-Wide Investigation
## Soil Data Results

The data, as presented in the tables within Chapter 2 of this report, are validated in strict accordance with USEPA's data validation functional guidelines (USEPA, 1994). However, for an investigation that demands knowledge of trace levels of a trace element having a very low regulatory criterion, these validation guidelines require that data, at their low end, be censored. Such censorship results in the loss of information that is useful to the data analyst (Gilbert, 1987) and, thereby, potentially meaningful to the risk manager.

Gilbert (1987), one of the world's preeminent environmental statisticians, offers this recommendation on how to deal with data near detection limits:

It is strongly recommended here that, whenever the measurement technique permits, report the actual measurement, whatever it may be, even if it is negative. Similar recommendations are also made by [U.S.] Environmental Protection Agency (USEPA,1980 Chapter 6) and American Society for Testing and Materials (ASTM, 1984).

Because most, if not all, modern methods of environmental chemical measurement in the laboratory permit it, it is beneficial to avoid data censorship. In order to maintain the quality of the data by adhering to Gilbert's recommendation, the uncensored data is presented in this appendix. The uncensored data presented here are validated within the context of the USEPA validation protocols except for the fact that they are not censored. These preserved and validated data allow a data analyst to avoid having to fabricate pseudo-values during subsequent data analyses, thereby allowing a higher quality evaluation of the data.

### References:

American Society for Testing and Materials (ASTM), 1984. *Annual Book of ASTM Standards*, "Section 11, Water and Environmental Technology," vol. 11.01, designation D4210-83.

Gilbert, R. O., 1987. *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

U.S. Environmental Protection Agency (USEPA), 1980. Upgrading Environmental Radiation Data. United States Environmental Protection Agency, Office of Radiation Programs. EPA/520/1-80-012.

U.S. Environmental Protection Agency (USEPA), 1994. Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA/540/R/94/083. Publication 9240-1-26.

**APPENDIX E**
**SPRING 2001 AREA-WIDE INVESTIGATION SOIL DATA RESULTS**

| Station ID | Facility Name | MWH ID | UI Sample ID | Silver mg/kg | Flag | Arsenic mg/kg | Flag | Barium mg/kg | Flag | Beryllium mg/kg | Flag | Cadmium mg/kg | Flag | Chromium mg/kg | Flag | Copper mg/kg | Flag | Manganese mg/kg | Flag | Lead mg/kg | Flag | Antimony mg/kg | Flag | pH (s.u.) | Flag | Electical Conductivity uS/cm | Flag | Organic Carbon mg/kg | Flag | Sand | Flag | Clay | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WD001-1 | Dry Valley Mine A Dump | 052101SSWD001-1-0 | E0100528 | 11 | J | 41 | | 110 | J | 1.8 | J | 71 | | 980 | J | 160 | J | 25 | J | 9.6 | | 13 | | 5.4 | | 0.21 | | 4.1 | | 32 | | 23 | |
| WD002-1 | Dry Valley Mine North B Dump | 052101SSWD002-1-0 | E0100529 | 5.8 | J | 38 | | 110 | J | 1.2 | J | 26 | | 420 | J | 76 | J | 270 | J | 5.7 | 7.5 U | 5.8 | 7.5 U | 7.3 | | 2.1 | | 4.7 | | 25 | | 28 | |
| WD003-1 | Dry Valley Mine South B Dump | 052101SSWD003-1-0 | E0100530 | 4.0 | J | 25 | | 68 | J | 0.97 | J | 26 | | 700 | J | 55 | J | 94 | J | 9.0 | | 8.4 | | 4.6 | | 2.6 | | 2.0 | | 59 | | 11 | |
| WD013-1 | Gay Mine Mill Shale Pile 19 | 051601SSWD013-0-0 | E0100330 | 3.5 | J | 54 | | 76 | J | 1.4 | J | 72 | | 850 | J | 90 | J | 220 | J | 8.1 | | 13 | | 7.6 | | 0.47 | | 2.2 | | 59 | | 13 | |
| WD021-1 | Gay Mine North Limb Dump 25 | 051601SSWD021-0-0 | E0100331 | 2.1 | J | 59 | | 180 | J | 1.5 | J | 47 | | 530 | J | 64 | J | 560 | J | 8.0 | | 9.7 | | 7.3 | | 0.42 | | 0.98 | | 53 | | 15 | |
| WD024-1 | Gay Mine East Limb Main Fill | 051601SSWD024-0-0 | E0100332 | 10 | J | 45 | | 100 | J | 1.4 | J | 99 | | 830 | J | 130 | J | 130 | J | 7.7 | | 13 | | 6.7 | | 0.54 | | 3.6 | | 36 | | 44 | |
| WD044-1 | Georgetown Canyon Mine Dump #1 | 052301SSWD044-1-0 | E0100569 | 2.0 | J | 34 | | 75 | J | 1.2 | J | 70 | | 760 | J | 74 | J | 110 | J | 2.8 | 7.5 U | 7.6 | | 7.5 | | 0.46 | | 2.9 | | 46 | | 20 | |
| WD045-1 | Georgetown Canyon Mine Dump #2 | 052301SSWD045-1-0 | E0100570 | 6.8 | J | 50 | | 76 | J | 1.6 | J | 67 | | 1200 | J | 120 | J | 67 | J | 2.8 | 7.5 U | 12 | | 7.3 | | 0.50 | | 6.6 | | 38 | | 27 | |
| WD047-1 | Georgetown Canyon Mine Dump #4 | 052301SSWD047-1-0 | E0100571 | 7.7 | J | 40 | | 71 | J | 1.5 | J | 40 | | 1200 | J | 130 | J | 92 | J | 2.6 | 7.5 U | 14 | | 7.2 | | 0.92 | | 6.4 | | 38 | | 28 | |
| WD050-1 | Central Farmers Plant Ore Stockpile | 052301SSWD050-1-0 | E0100572 | 6.4 | J | 48 | | 85 | J | 1.7 | J | 78 | | 1100 | J | 120 | J | 140 | J | 3.5 | 7.5 U | 14 | | 7.3 | | 1.2 | | 4.4 | | 35 | | 27 | |
| WD051-1 | North Maybe Mine Waste Dump | 052301SSWD095-1-0 | E0100575 | 2.0 | J | 41 | | 83 | J | 1.7 | J | 39 | | 1100 | J | 150 | J | 65 | J | 8.1 | | 11 | | 6.0 | | 0.36 | | 11 | | 41 | | 26 | |
| WD051-2 | North Maybe Mine Waste Dump | 052301SSWD098-1-0 | E0100573 | 5.5 | J | 39 | | 78 | J | 1.6 | J | 27 | | 1100 | J | 130 | J | 100 | J | 6.6 | 7.5 U | 13 | | 6.7 | | 0.45 | | 6.1 | | 27 | | 29 | |
| WD051-3 | North Maybe Mine Waste Dump | 052301SSWD097-1-0 | E0100574 | 9.7 | J | 47 | | 88 | J | 1.8 | J | 44 | | 1300 | J | 130 | J | 130 | J | 8.6 | | 18 | | 7.1 | | 0.69 | | 4.0 | | 18 | | 28 | |
| WD052-6 | Champ Mine Dump | 051701SSWD052-6-0 | E0100481 | 9.1 | J | 31 | | 120 | J | 1.3 | J | 28 | | 350 | J | 90 | J | 36 | J | 7.2 | 7.5 U | 6.1 | 7.5 U | 4.7 | | 0.74 | | 3.3 | | 15 | | 19 | |
| WD052-7 | Champ Mine Dump | 051701SSWD052-7-0 | E0100482 | 4.0 | J | 51 | | 76 | J | 1.3 | J | 17 | | 670 | J | 89 | J | 240 | J | 5.2 | 7.5 U | 9.0 | | 7.2 | | 2.6 | | 7.1 | | 41 | | 19 | |
| WD053-1 | Champ Mine Extension Dump | 051701SSWD053-0-0 | E0100483 | 0.93 | J | 17 | | 62 | J | 0.78 | J | 30 | | 310 | J | 30 | J | 290 | J | 0.95 | 7.5 U | 4.1 | 7.5 U | 7.4 | | 0.60 | | 1.1 | | 79 | | 7.8 | |
| WD055-1 | Mountain Fuel Mine Saddle Dump | 051701SSWD055-0-0 | E0100480 | 2.9 | J | 58 | | 110 | J | 1.7 | J | 8.3 | | 1500 | J | 140 | J | 160 | J | 3.5 | 7.5 U | 22 | | 6.3 | | 0.39 | | 2.6 | | 45 | | 23 | |
| WD056-1 | Mountain Fuel Mine Valley Dump | 051701SSWD056-0-0 | E0100479 | 3.4 | J | 77 | | 100 | J | 1.5 | J | 25 | | 930 | J | 100 | J | 77 | J | 4.8 | 7.5 U | 14 | | 4.6 | | 2.8 | | 5.9 | | 26 | | 25 | |
| WD057-1 | Mountain Fuel Mine East Limb Dump | 051701SSWD057-0-0 | E0100478 | 2.5 | J | 38 | | 48 | J | 0.77 | J | 49 | | 380 | J | 54 | J | 150 | J | -1.5 | 7.5 U | 4.1 | 7.5 U | 7.5 | | 2.6 | | 3.8 | | 46 | | 18 | |
| WD058-1 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-1-0 | E0100484 | 12 | J | 27 | | 70 | J | 1.9 | J | 94 | | 1200 | J | 150 | J | 36 | J | 8.8 | | 15 | | 4.2 | | 2.6 | | 10 | | 40 | | 21 | |
| WD058-2 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-2-0 | E0100485 | 7.1 | J | 26 | | 64 | J | 1.5 | J | 40 | | 810 | J | 120 | J | 42 | J | 5.4 | 7.5 U | 12 | | 4.8 | | 2.8 | | 5.6 | | 27 | | 24 | |
| WD058-3 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-3-0 | E0100486 | 7.7 | J | 29 | | 89 | J | 1.6 | J | 45 | | 760 | J | 130 | J | 170 | J | 7.2 | 7.5 U | 10 | | 4.9 | | 1.9 | | 4.7 | | 26 | | 34 | |
| WD059-1 | Wooley Valley Mine Unit I Overburden Dump | 051801SSWD059-0-0 | E0100488 | 4.6 | J | 59 | | 56 | J | 1.2 | J | 69 | | 560 | J | 66 | J | 190 | J | 5.3 | 7.5 U | 10 | | 7.3 | | 0.29 | | 2.1 | | 53 | | 14 | |
| WD060-1 | Wooley Valley Mine Unit III Overburden Dump | 051801SSWD060-0-0 | E0100487 | 8.9 | J | 39 | | 81 | J | 1.8 | J | 100 | | 980 | J | 100 | J | 27 | J | 5.0 | 7.5 U | 8.6 | | 5.8 | | 0.34 | | 5.4 | | 59 | | 15 | |
| WD061-1 | Wooley Valley Mine Unit IV Overburden Dump | 051801SSWD061-0-0 | E0100489 | 13 | J | 56 | | 65 | J | 1.3 | J | 62 | | 730 | J | 210 | J | 99 | J | 7.8 | | 12 | | 7.1 | | 0.74 | | 11 | | 43 | | 19 | |
| WD068-1 | Conda Mine West Limb Waste Dump | 052201SSWD068-1-0 | E0100568 | 3.7 | J | 56 | | 79 | J | 1.2 | J | 13 | | 480 | J | 71 | J | 230 | J | 7.1 | 7.5 U | 4.8 | 7.5 U | 7.5 | | 0.43 | | 1.7 | | 47 | | 21 | |
| WD069-1 | Conda Mine North Trail Waste Dump | 052201SSWD069-1-0 | E0100567 | 13 | J | 62 | | 130 | J | 1.9 | J | 92 | | 1300 | J | 140 | J | 73 | J | 7.7 | | 19 | | 7.1 | | 0.50 | | 8.8 | | 23 | | 34 | |
| WD072-1 | Conda Mine Woodall Waste Dump | 052201SSWD072-1-0 | E0100566 | 5.6 | J | 41 | | 66 | J | 1.1 | J | 9.9 | | 1100 | J | 83 | J | 170 | J | 9.4 | | 6.6 | 7.5 U | 7.0 | | 2.9 | | 4.6 | | 28 | | 25 | |
| WD073-1 | Lanes Creek Mine Waste Dump | 052101SSWD073-1-0 | E0100531 | 7.4 | J | 31 | | 51 | J | 1.7 | J | 79 | | 470 | J | 140 | J | 25 | J | 2.6 | 7.5 U | 15 | | 4.4 | | 1.9 | | 7.8 | | 28 | | 31 | |
| WD073-2 | Lanes Creek Mine Waste Dump | 052101SSWD073-2-0 | E0100532 | 9.4 | J | 42 | | 81 | J | 1.7 | J | 30 | | 1100 | J | 170 | J | 27 | J | 6.4 | 7.5 U | 19 | | 5.9 | | 0.55 | | 7.3 | | 16 | | 36 | |
| WD073-3 | Lanes Creek Mine Waste Dump | 052101SSWD073-3-0 | E0100533 | 13 | J | 49 | | 97 | J | 1.9 | J | 56 | | 1300 | J | 180 | J | 34 | J | 6.9 | 7.5 U | 20 | | 6.8 | | 0.23 | | 4.4 | | 21 | | 35 | |
| WD074-6 | Smoky Canyon Mine Waste Dump A1 | 051901SSWD074-6-0 | E0100490 | 6.7 | J | 47 | | 52 | J | 1.5 | J | 79 | | 940 | J | 130 | J | 63 | J | 4.5 | 7.5 U | 11 | | 4.8 | | 0.28 | | 6.0 | | 39 | | 14 | |
| WD075-6 | Smoky Canyon Mine Pit A Backfill | 051901SSWD075-6-0 | E0100491 | 2.8 | J | 21 | | 28 | J | 0.60 | J | 10 | | 320 | J | 38 | J | 220 | J | 5.6 | 7.5 U | 3.4 | 7.5 U | 7.6 | | 0.49 | | 1.4 | | 60 | | 17 | |
| WD076-6 | Smoky Canyon Mine Pole Canyon Waste Dump | 051901SSWD076-6-0 | E0100492 | 6.7 | J | 50 | | 87 | J | 1.5 | J | 42 | | 940 | J | 110 | J | 450 | J | 6.2 | 7.5 U | 14 | | 7.3 | | 1.3 | | 3.7 | | 33 | | 24 | |
| WD080-6 | Ballard Mine Pit #1 Overburden Dump #1 | 051501SSWD080-6-0 | E0100329 | 9.0 | J | 39 | | 100 | J | 1.7 | J | 120 | | 1100 | J | 150 | J | 100 | J | 10 | | 13 | | 7.2 | | 0.43 | | 5.6 | | 34 | | 23 | |
| WD081-1 | Ballard Mine Pit #1 Overburden Dump #2 | 051501SSWD081-0-0 | E0100328 | 0.53 | J | 22 | | 39 | J | 0.62 | J | 5.8 | | 260 | J | 87 | J | 99 | J | 9.8 | | 3.4 | 7.5 U | 7.1 | | 0.33 | | 0.98 | | 59 | | 17 | |
| WD085-1 | Henry Mine North Pit Overburden Dump | 051401SSWD085-0-0 | E0100256 | 4.4 | J | 37 | | 94 | J | 1.5 | J | 31 | | 1000 | J | 140 | J | 280 | J | 11 | | 15 | | 6.6 | | 0.17 | | 3.0 | | 22 | | 24 | |
| WD086-1 | Henry Mine Center Pit #1 Overburden Dump | 051401SSWD086-0-0 | E0100255 | 2.0 | J | 50 | | 110 | J | 1.6 | J | 19 | | 1100 | J | 120 | J | 270 | J | 5.4 | 7.5 U | 17 | | 6.4 | | 0.23 | | 1.9 | | 48 | | 21 | |
| WD090-1 | Henry Mine South Pit Overburden Dump | 051401SSWD090-0-0 | E0100254 | 7.2 | J | 49 | | 75 | J | 1.2 | J | 21 | | 800 | J | 120 | J | 200 | J | 2.8 | 7.5 U | 12 | | 7.1 | | 0.56 | | 5.7 | | 25 | | 25 | |
| WD091-1 | Enoch Valley Mine Overburden Dump | 051401SSWD091-1-0 | E0100251 | 4.4 | J | 40 | | 170 | J | 1.7 | J | 42 | | 1300 | J | 170 | J | 85 | J | 7.8 | | 23 | | 6.0 | | 0.16 | | 2.6 | | 42 | | 25 | |
| WD091-2 | Enoch Valley Mine Overburden Dump | 051401SSWD091-2-0 | E0100252 | 6.2 | J | 22 | | 110 | J | 2.0 | J | 37 | | 1400 | J | 170 | J | 42 | J | 8.1 | | 14 | | 6.3 | | 0.18 | | 4.0 | | 27 | | 25 | |
| WD092-1 | Enoch Valley Mine Canyon Fill Dump | 051401SSWD092-0-0 | E0100253 | 5.9 | J | 57 | | 75 | J | 1.5 | J | 31 | | 940 | J | 110 | J | 110 | J | 3.8 | 7.5 U | 16 | | 7.2 | | 0.34 | | 3.8 | | 19 | | 25 | |
| WD093-1 | Ballard Mine Pit #2 Overburden Dump | 051501SSWD093-0-0 | E0100327 | 0.59 | J | 28 | | 91 | J | 1.3 | J | 18 | | 520 | J | 50 | J | 480 | J | 8.0 | | 5.2 | 7.5 U | 6.6 | | 0.22 | | 1.0 | | 45 | | 18 | |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analyses.
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation process.
Data qualifier definitions are:
(U) - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
(J) - The associated value is an estimated quantity.
(R) - The data are unusable.
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
na: Not Available.
ND: Not Detected.

**APPENDIX E**
**SPRING 2001 AREA-WIDE INVESTIGATION SOIL DATA RESULTS**

| Station ID | | MWH ID | UI Sample ID | Silt | Flag | > 2 mm | Flag | Texture | Flag | Boron mg/kg | Flag | Fluoride mg/kg | Flag | Mercury mg/kg | Flag | Molybdenum mg/kg | Flag | Nickel mg/kg | Flag | Selenium mg/kg | Flag | Sodium mg/kg | Flag | Thallium mg/kg | Flag | Uranium mg/kg | Flag | Vanadium mg/kg | Flag | Zinc mg/kg | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WD001-1 | Dry Valley Mine A Dump | 052101SSWD001-1-0 | E0100528 | 45 | | 45 | | | | 33 | 85 UJ | 500 | | 0.68 | J | 16 | | 170 | | 17 | J | 1300 | J | -20 | 2.0 UJ | 44 | J | 610 | | 820 | |
| WD002-1 | Dry Valley Mine North B Dump | 052101SSWD002-1-0 | E0100529 | 47 | | 35 | | CL | | 28 | 85 UJ | 960 | | 0.34 | J | 20 | | 240 | | 33 | J | 1400 | J | na | | 32 | J | 230 | | 1300 | |
| WD003-1 | Dry Valley Mine South B Dump | 052101SSWD003-1-0 | E0100530 | 30 | | 53 | | SL | | 47 | 85 UJ | 1200 | | 0.25 | J | 14 | | 320 | | 43 | J | 670 | J | -23 | 2.0 UJ | 28 | J | 160 | | 570 | |
| WD013-1 | Gay Mine Mill Shale Pile 19 | 051601SSWD013-0-0 | E0100330 | 28 | | 34 | | SL | | 2.2 | 85 UJ | 1100 | | 0.45 | J | 37 | | 260 | | 10 | J | 2200 | J | -2.5 | 2.0 UJ | 35 | J | 610 | | 1400 | |
| WD021-1 | Gay Mine North Limb Dump 25 | 051601SSWD021-0-0 | E0100331 | 32 | | 30 | | SL | | 7.9 | 85 UJ | 1100 | | 0.31 | J | 9.8 | | 94 | | 6.1 | J | 1500 | J | -25 | 2.0 UJ | 43 | J | 780 | | 660 | |
| WD024-1 | Gay Mine East Limb Main Fill | 051601SSWD024-0-0 | E0100332 | 20 | | 27 | | L | | 33 | 85 UJ | 300 | | 0.60 | J | 26 | | 270 | | 14 | J | 2000 | J | -23 | 2.0 UJ | 40 | J | 930 | | 1200 | |
| WD044-1 | Georgetown Canyon Mine Dump #1 | 052301SSWD044-1-0 | E0100569 | 33 | | 51 | | L | | 39 | 85 UJ | 250 | | 0.40 | J | 36 | | 230 | | 19 | J | 2200 | J | na | | 53 | J | 820 | | 1400 | |
| WD045-1 | Georgetown Canyon Mine Dump #2 | 052301SSWD045-1-0 | E0100570 | 35 | | 30 | | L | | 32 | 85 UJ | 770 | | 0.59 | J | 29 | | 250 | | 200 | J | 2000 | J | -0.33 | 2.0 UJ | 51 | J | 970 | | 1100 | |
| WD047-1 | Georgetown Canyon Mine Dump #4 | 052301SSWD047-1-0 | E0100571 | 35 | | 34 | | CL | | 46 | 85 UJ | 590 | | 0.61 | J | 27 | | 260 | | 110 | J | 1400 | J | -2.2 | 2.0 UJ | 41 | J | 450 | | 1000 | |
| WD050-1 | Central Farmers Plant Ore Stockpile | 052301SSWD050-1-0 | E0100572 | 39 | | 31 | | L | | 31 | 85 UJ | 620 | | 0.62 | J | 35 | | 240 | | 34 | J | 2500 | J | -19 | 2.0 UJ | 59 | J | 900 | | 1100 | |
| WD051-1 | North Maybe Mine Waste Dump | 052301SSWD095-1-0 | E0100575 | 32 | | 53 | | L | | 50 | 85 UJ | 420 | | 1.0 | J | 6.2 | | 200 | | 330 | J | 2100 | J | -8.0 | 2.0 UJ | 29 | J | 610 | | 590 | |
| WD051-2 | North Maybe Mine Waste Dump | 052301SSWD098-1-0 | E0100573 | 45 | | 45 | | CL | | 30 | 85 UJ | 1100 | | 0.75 | J | 16 | | 300 | | 140 | J | 1900 | J | -1.2 | 2.0 UJ | 31 | J | 320 | | 1000 | |
| WD051-3 | North Maybe Mine Waste Dump | 052301SSWD097-1-0 | E0100574 | 55 | | 41 | | SiCL | | 33 | 85 UJ | 840 | | 0.72 | J | 27 | | 380 | | 41 | J | 2100 | J | -34 | 2.0 UJ | 38 | J | 480 | | 1500 | |
| WD052-6 | Champ Mine Dump | 051701SSWD052-6-0 | E0100481 | 67 | | 31 | | SiL | | 12 | 85 UJ | 960 | | 0.54 | J | 20 | | 340 | | 33 | J | 1000 | J | -40 | 2.0 UJ | 20 | J | 850 | | 1700 | |
| WD052-7 | Champ Mine Dump | 051701SSWD052-7-0 | E0100482 | 40 | | 42 | | L | | -1.0 | 85 UJ | 1100 | | 0.46 | J | 39 | | 280 | | 47 | J | 1500 | J | na | | 33 | J | 180 | | 850 | |
| WD053-1 | Champ Mine Extension Dump | 051701SSWD053-0-0 | E0100483 | 13 | | 40 | | LS | | 20 | 85 UJ | 1200 | | 0.18 | J | 5.7 | | 110 | | 9.7 | J | 680 | J | na | | 30 | J | 140 | | 500 | |
| WD055-1 | Mountain Fuel Mine Saddle Dump | 051701SSWD055-0-0 | E0100480 | 32 | | 38 | | L | | 46 | 85 UJ | 770 | | 0.85 | J | 31 | | 380 | | 20 | J | 2300 | J | -13 | 2.0 UJ | 34 | J | 210 | | 1100 | |
| WD056-1 | Mountain Fuel Mine Valley Dump | 051701SSWD056-0-0 | E0100479 | 49 | | 38 | | L | | 52 | 85 UJ | 270 | | 0.56 | J | 37 | | 340 | | 94 | J | 1900 | J | -20 | 2.0 UJ | 36 | J | 500 | | 1400 | |
| WD057-1 | Mountain Fuel Mine East Limb Dump | 051701SSWD057-0-0 | E0100478 | 36 | | 43 | | L | | -7.6 | 85 UJ | 220 | | 0.26 | J | 31 | | 190 | | 21 | J | 1700 | J | na | | 14 | J | 410 | | 990 | |
| WD058-1 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-1-0 | E0100484 | 39 | | 44 | | L | | 76 | 85 UJ | 630 | | 0.77 | J | 44 | | 220 | | 160 | J | 1500 | J | -16 | 2.0 UJ | 33 | J | 600 | | 1100 | |
| WD058-2 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-2-0 | E0100485 | 49 | | 40 | | L | | 25 | 85 UJ | 860 | | 0.55 | J | 12 | | 190 | | 83 | J | 1300 | J | -21 | 2.0 UJ | 30 | J | 340 | | 760 | |
| WD058-3 | Rasmussen Ridge Mine South Pit Dump | 051801SSWD058-3-0 | E0100486 | 40 | | 48 | | L | | 39 | 85 UJ | 600 | | 0.46 | J | 18 | | 220 | | 74 | J | 1300 | J | -19 | 2.0 UJ | 33 | J | 340 | | 850 | |
| WD059-1 | Wooley Valley Mine Unit I Overburden Dump | 051801SSWD059-0-0 | E0100488 | 33 | | 39 | | SL | | -13 | 85 UJ | 540 | | 0.42 | J | 17 | | 350 | | 62 | J | 3300 | J | na | | 50 | J | 660 | | 2000 | |
| WD060-1 | Wooley Valley Mine Unit III Overburden Dump | 051801SSWD060-0-0 | E0100487 | 26 | | 50 | | SL | | 6.6 | 85 UJ | 440 | | 0.54 | J | 7.4 | | 170 | | 120 | J | 2700 | J | -25 | 2.0 UJ | 63 | J | 1200 | | 810 | |
| WD061-1 | Wooley Valley Mine Unit IV Overburden Dump | 051801SSWD061-0-0 | E0100489 | 37 | | 33 | | L | | 21 | 85 UJ | 910 | | 0.85 | J | 45 | | 460 | | 98 | J | 2600 | J | -9.9 | 2.0 UJ | 62 | J | 350 | | 1700 | |
| WD068-1 | Conda Mine West Limb Waste Dump | 052201SSWD068-1-0 | E0100568 | 32 | | 48 | | L | | 37 | 85 UJ | 850 | | 0.39 | J | 21 | | 180 | | 14 | J | 880 | J | -9.1 | 2.0 UJ | 16 | J | 200 | | 560 | |
| WD069-1 | Conda Mine North Trail Waste Dump | 052201SSWD069-1-0 | E0100567 | 43 | | 41 | | CL | | 34 | 85 UJ | 930 | | 0.58 | J | 65 | | 350 | | 58 | J | 2300 | J | -16 | 2.0 UJ | 38 | J | 920 | | 1900 | |
| WD072-1 | Conda Mine Woodall Waste Dump | 052201SSWD072-1-0 | E0100566 | 47 | | 51 | | L | | 53 | 85 UJ | 680 | | 0.39 | J | 15 | | 410 | | 34 | J | 1500 | J | na | | 26 | J | 140 | | 1100 | |
| WD073-1 | Lanes Creek Mine Waste Dump | 052101SSWD073-1-0 | E0100531 | 42 | | 38 | | CL | | 54 | 85 UJ | 480 | | 0.78 | J | 8.4 | | 230 | | 1500 | J | 1500 | J | -9.4 | 2.0 UJ | 20 | J | 620 | | 740 | |
| WD073-2 | Lanes Creek Mine Waste Dump | 052101SSWD073-2-0 | E0100532 | 49 | | 35 | | SiCL | | 48 | 85 UJ | 480 | | 0.93 | J | 12 | | 280 | | 1300 | J | 2300 | J | -30 | 2.0 UJ | 22 | J | 570 | | 1000 | |
| WD073-3 | Lanes Creek Mine Waste Dump | 052101SSWD073-3-0 | E0100533 | 44 | | 44 | | CL, SiCL | | 44 | 85 UJ | 430 | | 0.95 | J | 12 | | 290 | | 130 | J | 2100 | J | -19 | 2.0 UJ | 43 | J | 870 | | 1100 | |
| WD074-6 | Smoky Canyon Mine Waste Dump A1 | 051901SSWD074-6-0 | E0100490 | 47 | | 48 | | L | | 41 | 85 UJ | 290 | | 0.49 | J | 29 | | 190 | | 550 | J | 1800 | J | -18 | 2.0 UJ | 21 | J | 790 | | 810 | |
| WD075-6 | Smoky Canyon Mine Pit A Backfill | 051901SSWD075-6-0 | E0100491 | 23 | | 66 | | SL | | 1.7 | 85 UJ | 1000 | | 0.22 | J | 13 | | 180 | | 9.7 | J | 700 | J | 1.3 | 2.0 UJ | 14 | J | 95 | | 410 | |
| WD076-6 | Smoky Canyon Mine Pole Canyon Waste Dump | 051901SSWD076-6-0 | E0100492 | 43 | | 34 | | L | | 24 | 85 UJ | 690 | | 0.53 | J | 26 | | 370 | | 21 | J | 2900 | J | -9 | 2.0 UJ | 39 | J | 470 | | 1400 | |
| WD080-6 | Ballard Mine Pit #1 Overburden Dump #1 | 051501SSWD080-6-0 | E0100329 | 43 | | 26 | | L | | 34 | 85 UJ | 550 | | 0.52 | J | 26 | | 270 | | 83 | J | 1600 | J | -10 | 2.0 UJ | 46 | J | 780 | | 1500 | |
| WD081-1 | Ballard Mine Pit #1 Overburden Dump #2 | 051501SSWD081-0-0 | E0100328 | 24 | | 54 | | SL | | 20 | 85 UJ | 1100 | | 0.21 | J | 15 | | 160 | | 14 | J | 440 | J | -36 | 2.0 UJ | 16 | J | 95 | | 390 | |
| WD085-1 | Henry Mine North Pit Overburden Dump | 051401SSWD085-0-0 | E0100256 | 54 | | 24 | | SiL | | 21 | 85 UJ | 910 | | 0.57 | J | 11 | | 230 | | 34 | J | 1000 | J | -22 | 2.0 UJ | 25 | J | 310 | | 580 | |
| WD086-1 | Henry Mine Center Pit #1 Overburden Dump | 051401SSWD086-0-0 | E0100255 | 31 | | 49 | | L | | 5.7 | 85 UJ | 810 | | 0.58 | J | 23 | | 330 | | 25 | J | 1600 | J | -9.3 | 2.0 UJ | 28 | J | 260 | | 1200 | |
| WD090-1 | Henry Mine South Pit Overburden Dump | 051401SSWD090-0-0 | E0100254 | 50 | | 33 | | L | | 34 | 85 UJ | 550 | | 0.69 | J | 39 | | 420 | | 39 | J | 1500 | J | na | | 39 | J | 250 | | 1500 | |
| WD091-1 | Enoch Valley Mine Overburden Dump | 051401SSWD091-1-0 | E0100251 | 33 | | 24 | | L | | 10 | 85 UJ | 1000 | | 0.87 | J | 12 | | 270 | | 35 | J | 1200 | J | -25 | 2.0 UJ | 39 | J | 320 | | 1000 | |
| WD091-2 | Enoch Valley Mine Overburden Dump | 051401SSWD091-2-0 | E0100252 | 48 | | 30 | | L | | 17 | 85 UJ | 1100 | | 0.76 | J | 6.2 | | 120 | | 38 | J | 960 | J | -7.8 | 2.0 UJ | 42 | J | 510 | | 350 | |
| WD092-1 | Enoch Valley Mine Canyon Fill Dump | 051401SSWD092-0-0 | E0100253 | 57 | | 34 | | SiL | | 23 | 85 UJ | 2300 | | 0.47 | J | 41 | | 400 | | 61 | J | 1300 | J | na | | 27 | J | 410 | | 1700 | |
| WD093-1 | Ballard Mine Pit #2 Overburden Dump | 051501SSWD093-0-0 | E0100327 | 37 | | 39 | | L | | 10 | 85 UJ | 1400 | | 0.27 | J | 14 | | 210 | | 14 | J | 770 | J | -23 | 2.0 UJ | 23 | J | 160 | | 840 | |

**Notes:**
Data validation was performed in accordance with Montgomery Watson SOP-NW-18.1 and USEPA Laboratory Data Validation Funtional Guidelines for Evaluating Inorganic Analyses.
Flag refers to the USEPA data qualifier (flag) assigned to the data resulting from the data validation procedure. More than one flag may be assigned during the data validation process.
Data qualifier definitions are:
(U) - The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
(J) - The associated value is an estimated quantity.
(R) - The data are unusable.
(UJ) - The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
na: Not Available.
ND: Not Detected.