Site Inspection Report for the Abandoned and Inactive Mines in Idaho on U.S. Forest Service Lands (Region 1), Idaho Panhandle National Forest: Volume V, Section A: Coeur d'Alene River Drainage Surrounding the Coeur d'Alene Mining District (Excluding the Prichard Creek and Eagle Creek Drainages), Secondary Properties

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1.0 PROJECT OVERVIEW

1.1 INTRODUCTION

In order to fulfill its obligations under the Clean Water Act and related legislation, the Northern Region of the United States Forest Service (USFS) needs to identify and characterize the abandoned and inactive mines with environmental, health, and/or safety problems that are on or could impact National Forest Service-administered lands. The Northern Region of the USFS administers National Forest lands in the northern part of Idaho, Montana, and parts of North and South Dakota. The Idaho Geological Survey (IGS) is the lead state agency for the collection, interpretation, and distribution of information about the geology and mineral resources of Idaho. The USFS and the IGS, having determined that an inventory and preliminary characterization of abandoned and inactive mines in Idaho would be beneficial to both agencies, have entered into a series of participating agreements to accomplish this work. The first forest inventoried was the Panhandle National Forest. Volume III and Volume V (Sections A through D) present the results of the work done in the Coeur d’Alene River basin, excluding properties in the Prichard-Eagle Creek drainage (which are covered in Volumes I and IV). Appendix E contains a list of all reports prepared for this project. For continuity, the general design of this report follows that used by the Montana Bureau of Mines and Geology for similar studies in Montana.

1.2 PROJECT OBJECTIVES

In 1992, the USFS and IGS entered into an agreement to inventory abandoned and inactive mines on or affecting Forest Service lands in Idaho. Work on the initial phase of the project included developing a computerized database of all such mines and prospects and plotting the locations of these properties on National Forest base maps. Phase 2 work conducted the following year provided the Forest Service with screening forms containing site information from the database and map overlays at 7.5-minute scale for areas of dense mining activity. Phase 3 started in the summer of 1996 and included field examination of properties in the Prichard Creek and Eagle Creek basins (Summit mining district) in Shoshone County, field examination of properties in the Gold Creek drainage (Lakeview mining district) in Bonner County, and preparation of reports discussing the ownership and operational history of selected mines. Field work in the summer of 1997 covered properties in the Coeur d’Alene River basin surrounding the Coeur d’Alene mining district that had not been examined the previous summer.

The overall objectives of this inventory and preliminary characterization process, as defined by the USFS, are to:

1. Systematically identify all mine sites with possible human health, environmental, and/or safety related problems that either are on or affecting National Forest Service lands.

2. Identify the human health and environmental risks at each location based on site characterization factors (see Section 1.5), including screening-level soil and water samples
taken and analyzed in accordance with Environmental Protection Agency (EPA) protocols and quality control procedures.

3. Based on site characterization factors, identify those sites that are not affecting National Forest Service lands and that can therefore be eliminated from further consideration.

4. Cooperate with other state and federal agencies, and integrate the Northern Region program with their programs.

5. Develop and maintain a data file of site information that will allow the Region to pro-actively respond to governmental and public interest group concerns.

In addition to the USFS objectives outlined above, the IGS objectives include gathering new information associated with these abandoned and inactive mines. The Survey's enabling legislation (Sections 47-201–47-204 of the Idaho Code) designates the IGS as the lead state agency for the collection, interpretation, and distribution of all geologic and minerals data for Idaho.

1.3 ABANDONED AND INACTIVE MINES DEFINED

For the purposes of this study, mines, mills, or other processing facilities related to mineral extraction and/or processing are defined as abandoned or inactive as follows:

A mine is considered *abandoned* if there are no identifiable owners or operators for the facilities, or if the facilities have reverted to federal ownership.

A mine is considered to be *inactive* if there is an identifiable owner or operator of the facility, but the facility is not currently operating and there are no approved authorizations or permits to operate.

1.4 HEALTH AND ENVIRONMENTAL PROBLEMS AT MINES

A variety of safety, health, and environmental problems may occur at abandoned and inactive mines. These include metals that contaminate ground water, surface water, and soils; airborne dust from abandoned tailings impoundments; eroding mine and mill waste materials that contribute excessive amounts of sediment to surface waters; unstable waste piles with the potential for catastrophic failure; and physical hazards associated with mine openings and dilapidated structures. The most important environmental hazard is the contamination of both surface and subsurface water by metals, acid mine drainage, or sediment loading.

Metals are often transported from a mine by water (ground water discharge or surface runoff) and may be dissolved, suspended, or carried as part of the bedload. When sulfides are present, acid water can form; this, in turn, increases the solubility of metals. This condition, known as acid mine drainage (AMD), is a significant source of metal releases at some mine sites in Idaho.
1.4.1 Acid Mine Drainage

Trexler and others (1975) identified six factors that govern the formation of metal-laden acid mine waters. They are:

1) availability of acid-producing minerals, particularly pyrite,
2) presence of oxygen,
3) moisture in the atmosphere,
4) availability of leachable heavy metals,
5) availability of water to transport the dissolved constituents, and
6) mine characteristics, which affect movement of air and water through the mine workings.

These factors occur not only within the mines themselves, but also within mine dumps and mill tailings piles, making these waste materials potential sources of contamination as well. Formation of acid mine drainage can be reduced if minerals such as calcite, which can neutralize acidity, are present (Trexler and others, 1975; Marvin and others, 1995).

Acid mine drainage is formed by the oxidation and dissolution of sulfides, particularly pyrite (FeS₂) and pyrrhotite (Fe₁₋₄S). Other sulfides play a minor role in acid generation. Oxidation of iron sulfides forms sulfuric acid (H₂SO₄), sulfate ions (SO₄²⁻), and reduced iron (Fe²⁺). When sulfide-bearing rock is mined, the sulfide minerals are exposed to atmospheric oxygen and oxygen-bearing water. Consequently, the sulfide minerals are oxidized, and acid mine waters are produced (Trexler and others, 1975; Marvin and others, 1995).

The oxidation of the reduced iron is the step that limits how much acid will form. The rate of this reaction can be greatly increased by iron-oxidizing bacteria (*Thiobacillus ferrooxidans*). The oxidized iron produced by biological activity promotes further oxidation and dissolution of pyrite, pyrrhotite, and marcasite (FeS₂, a dimorph of pyrite) (Trexler and others, 1975; Marvin and others, 1995).

Once formed, the acid can dissolve other sulfide minerals to produce high concentrations of copper, lead, zinc, and other metals. Minerals that can contribute heavy metals to acid mine drainage include arsenopyrite, FeAsS; chalcopyrite, CuFeS₂; galena, PbS; tetrahedrite, (CuFe)₁₂Sb₄S₁₃; and sphalerite, (Zn, Fe)S. Aluminum can be leached by the dissolution of aluminosilicates common in soils and waste material found in Idaho. The dissolution of any given metal is controlled by the solubility of that metal (Trexler and others, 1975; Marvin and others, 1995).

1.4.2 Solubility of Selected Metals

The following information is paraphrased from Marvin and others (1995, p. 5-6). This report cites the following references as sources for this material: Lindsay (1979), Stumm and Morgan (1981), Hem (1985), and Maest and Metesh (1993).
At a pH above 2.2, ferric hydroxide $[\text{Fe(OH)}_3]$ produces a brownish orange color in surface waters and forms a precipitate with a similar color on rocks in affected streams. If other metals, such as copper, lead, cadmium, zinc, and aluminum, are present in the source rock, they may also precipitate with or adsorb onto the ferric hydroxide (Stumm and Morgan, 1981). Alunite $[\text{KAl}_4(\text{SO}_4)_2(\text{OH})_8]$ and jarosite $[\text{KFe}_3(\text{SO}_4)_2(\text{OH})_6]$ will precipitate at a pH of less than 4, depending on $\text{SO}_4^{2-}$ and $\text{K}^+$ activities (Lindsay, 1979).

Under acidic conditions, the solubility of the metal controls how much will be released into the environment:

**Manganese** solubility is strongly controlled by the redox state and is limited by the presence of minerals such as pyrolusite and manganite; under reducing conditions, pyrolusite $[\text{MnO}_2]$ dissolves and manganite $[\text{MnO(OH)}]$ precipitates. Manganese is found in mineralized environments as rhodochrosite $[\text{MnCO}_3]$ and its weathering products.

**Aluminum** solubility is most often controlled by alunite $[\text{KAl}_4(\text{SO}_4)_2(\text{OH})_8]$ or by gibbsite $[\text{Al(OH)}_3]$, depending on pH. Aluminum is one of the most common elements in rock-forming minerals such as feldspars, micas, and clays.

**Arsenic** tends to precipitate and adsorb with iron at low pH and de-sorb or dissolve at higher pH. Once oxidized, arsenic will be found in solution in higher pH waters. When the pH is between 3 and 7, the dominant arsenic compound is a monovalent arsenate, $\text{H}_2\text{AsO}_4$. Arsenic is abundant in metallic mineral deposits as arsenopyrite $[\text{FeAsS}]$, enargite $[\text{Cu}_3\text{AsS}_4]$, tennantite $[\text{Cu}_{12}\text{As}_4\text{S}_{13}]$, and other minerals.

**Cadmium** solubility data are limited. When the pH of soils is above 7.5, the solubility of cadmium is controlled by the carbonate species octavite $[\text{CdCO}_3]$; when the pH of the soil is below 6, cadmium solubility is controlled by strengite $[\text{Cd}_3(\text{PO}_4)_2]$. Octavite is the dominant control on the solubility of cadmium in soils. In water, at low partial pressures of $\text{H}_2\text{S}$, $\text{CdCO}_3$ is easily reduced to $\text{CdS}$.

**Copper** solubility in natural waters is controlled primarily by the amount of carbonate present; malachite $[\text{Cu}_2(\text{OH})_2\text{CO}_3]$ and azurite $[\text{Cu}_3(\text{OH})_2(\text{CO}_3)_2]$ form when $\text{CO}_3^{2-}$ ions are available in sufficient concentrations. In soil, copper combines readily with iron to form cupric ferrite. Other compounds, such as sulfate and phosphates, may also control copper solubility in soils. Copper is present in many ore minerals, including chalcopryite $[\text{CuFeS}_2]$, bornite $[\text{Cu}_5\text{FeS}_4]$, chalcocite $[\text{Cu}_2\text{S}]$, and tetrahedrite $[\text{Cu}_{12}\text{Sb}_4\text{S}_{13}]$. 
Mercury readily vaporizes under atmospheric conditions and thus is most often found in concentrations well below the 25 μg/L equilibrium concentration. The most stable form of mercury in soil is its elemental form. Mercury is found in low temperature hydrothermal ores as cinnabar [HgS], in epithermal (hot springs) deposits as native mercury, and as native mercury in man-made deposits where mercury was used to process gold ores.

Lead concentrations in natural waters are controlled by the formation of lead carbonate, which has an equilibrium concentration of 50 μg/L when the pH is between 7.5 and 8.5. As with other metals, concentrations in solution increase with decreasing pH. In sulfate soils with a pH of less than 6, the formation of anglesite determines how much lead will remain in solution. The formation of cerussite, a lead carbonate, controls solubility in buffered soils. Lead occurs in the common ore mineral galena [PbS].

Zinc solubility is controlled by the formation of zinc hydroxide and zinc carbonate in natural waters. When the pH is above 8, the equilibrium concentration of zinc in water with a high bicarbonate content is less than 100 μg/L. Franklinite may control solubility at pH less than 5 in water and soils, and its formation is strongly affected by sulfate concentrations. Thus, production of sulfate from acid mine drainage may ultimately control the solubility of zinc in water affected by mining. Sphalerite [ZnS] is common in mineralized systems.

1.4.3 The Use of pH and Specific Conductivity to Identify Water Quality Problems

Specific conductance (SC) and pH provide a rapid way to distinguish many "problem" mine sites from those that have no adverse water-related impacts. As a rough screening tool, low pH (<6.0) and high SC (variable) usually occur at sites with problems; neutral or higher pH and low SC indicate sites that are less likely to have serious problems.

Limiting data collection only to pH and SC largely ignores the various controls on solubility and can lead to overlooking some types of problems. Arsenic, for example, is most mobile in waters with higher pH values (>7), and its concentration is strongly dependent on the presence of dissolved iron. Cadmium and lead may also exceed standards in waters with pH values within acceptable limits.

Reliance on SC as an indicator of site conditions can also be misleading in certain situations. The SC value of a sample represents 55 to 75 percent of the total dissolved solids (TDS), depending on the concentration of sulfate. Also, it is necessary to have a statistically significant amount of SC data for a study area in order to define what constitutes a high or low SC value.

In some cases, a water sample with a near-neutral pH and a moderate SC could have one or more dissolved metal species that may exceed standards. The complete evaluation of a mine site for
adverse impacts on water and soil should include the collection of samples for analysis of metals, cations, and anions.

1.5 METHODOLOGY

1.5.1 Data Sources

The IGS began compiling a database of mining properties in Idaho in 1979. This work has continued to date, and the database (now digital) contains information on some 8,700 mines and prospects. All or parts of the following databases and information sources have been integrated into this digital information system:

1. the Mineral Industry Location Subsystem (MILS) database (U.S. Bureau of Mines)
2. the Mineral Resources Data System (MRDS) database (U.S. Geological Survey)
3. published compilations of mines and prospects data
4. state publications on Idaho mineral deposits
6. IGS mineral property files
7. all mines and prospects noted on the appropriate USGS 7.5-minute quadrangle maps
8. data held in private collections or company information.

Most of the data for this project were collated with existing data in the IGS Mines and Prospects digital database. As noted, this is the most complete compilation available for information on Idaho's mining properties. The IGS continues to update the database, which now contains an estimated 85-90 percent of the mining properties in the state. During the field visits, the IGS located some (but not many) mines and prospects for which no previous information existed. Also, a very few mines listed in the database were not found.

1.5.2 Pre-field Screening

Field crews visited almost all the mine sites in the study area, emphasizing the properties with the potential to release hazardous substances and those for which there was not enough information available to make that determination without a field visit. The IGS and the USFS developed screening criteria (Table 1.5-1) which they used to determine if a site had the potential to release hazardous substances or posed other environmental or safety hazards. The first page of the Field Form (Appendix A) contains the screening criteria. If any of the answers were "yes" or unknown, the site was visited. Personal knowledge of a site and published information were used initially to answer the questions. Forest Service mineral specialists used these criteria to "screen out" several sites using their knowledge of an area.

Mine sites which were not visited were retained in the database along with the data source(s) that were consulted. However, if these sites were close to a visited site, the geologist usually looked at them to verify that the screening information was correct.
Placer mines were not studied as part of this project. Although mercury was used in amalgamating free gold in placer mines, the complex nature of placer deposits makes detection of mercury difficult and is beyond the scope of this inventory. Due to their oxidized nature, placer deposits are not likely to contain other anomalous concentrations of heavy metals.

Table 1.5-1. Screening Criteria (answer Yes or No to each item).

<table>
<thead>
<tr>
<th>Yes/No</th>
<th>Screening Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Mill site or tailings present.</td>
</tr>
<tr>
<td></td>
<td>2. Adits with discharge or evidence of discharge.</td>
</tr>
<tr>
<td></td>
<td>3. Evidence of or strong likelihood for metal leaching or AMD (water stains, stressed or lack of vegetation, waste below water table, etc.)</td>
</tr>
<tr>
<td></td>
<td>4. Mine waste in floodplain or shows signs of water erosion.</td>
</tr>
<tr>
<td></td>
<td>5. Residences, high public use area, or environmentally sensitive area (as listed in HRS) within 200 feet of the disturbance.</td>
</tr>
<tr>
<td></td>
<td>6. Hazardous wastes/materials (chemical containers, explosives, etc.)</td>
</tr>
<tr>
<td></td>
<td>7. Open adits/shafts, highwalls, or hazardous structures/debris.</td>
</tr>
</tbody>
</table>

If the answers to criteria 1 through 6 were all "NO" (based on literature, personal knowledge, or a site visit), the site was not investigated further.

1.5.3 Field Inspection Procedures

The sites which could not be screened out by using the criteria in Table 1.5-1 were visited by an IGS geologist. At sites for which little geologic or mining data existed, geologists characterized the geology, collected samples for geochemical analysis, evaluated the deposit, and described surface workings and processing facilities present. All information required to fill in the Field Questionnaire (Appendix A) was gathered.

When it was determined that a site had a possible environmental problem, more sampling and description were required. Information was collected concerning environmental degradation, hazardous mine openings, the presence of structures, and land ownership. After the potential problems were described, appropriate soil and water samples were collected. All site locations were refined using conventional field methods, and each site was located by latitude and longitude and by Township, Range, and Section. If previously determined, these values were checked and corrected, as needed.

On public lands, sites with ground-water discharge, flowing surface water, or contaminated soils (as indicated by impacts on vegetation) were mapped. Sketch maps show locations of the workings, exposed geology, dumps, tailings, and surface water and geologic sample locations. Oblique aerial photographs were sometimes substituted or used to supplement the field sketches.
The site was photographically recorded using both still images and videotape. The videotape record proved especially useful for site description and review, and is recommended for future studies.

1.5.3.1 Soil, Rock, and Mine Waste Sampling Procedures

At sites identified as having a potential problem, the geologist collected soil, rock, and waste samples, as appropriate. Sample locations were selected in areas where waste material was obviously impacting natural material. In most cases a composite sample was gathered to get as representative a sample as possible, or multiple samples were collected. All sample sites were located so as to assess conditions on National Forest lands. Three types of samples were collected:

1) select rock, soil, or waste samples—specimens representing a particular material taken for analysis;

2) composite samples—rock and soil taken systematically from a waste dump or tailings pile for analysis, representing the overall composition of material in the source;

3) leach samples—duplicates of selected composite samples (usually waste rock or mill tailings) for testing leachable metals.

The three types of samples were used to examine the value and metal content of dumps and tailings, and to check the availability of metals during leaching when sample sites were exposed to water. Outcrops and waste materials were not sampled extensively enough to provide reliable estimates of tonnages, grades, or economic feasibility.

1.5.3.2 Water Sampling Procedure

As noted, this project focused on the impacts of mining on surface water, ground water, and soils. The reasoning behind this approach was that a mine disturbance may have high total metal concentrations yet may be releasing few metals into the surface water, ground water, or soil. Conversely, another disturbance could have lower total metal content but be releasing metals in concentrations that adversely impact the environment.

The geologist selected and marked water sample sites based on field parameters (SC, pH, temperature) and observations (such as erosion and staining of soils or stream beds). Sample locations were chosen that would provide the best information on the relative impact of the site to surface water and soils. All sites were accurately located on topographic base maps. Surface water samples were collected at all discharge points at the site, as well as samples from upstream and downstream of the site.

At each water sampling site, the temperature, specific conductivity, and pH were measured. A unique sample number was affixed to the sample bottle. Two 125-ml samples were collected.
One sample was left raw and the other was acidified with 0.1N nitric acid. Both samples were stored in a secured ice box. The samples remained under constant refrigeration and security until submitted for analysis.

Since monitoring wells were not installed as part of this investigation, the evaluation of metal contamination of ground water was limited to strategic sampling of surface water and soils. In most cases, background water-quality data at a particular mine site was restricted to upstream surface water samples. However, in some drainages background samples were collected at sites with no visible contamination and no known mining activity upstream from the sampling location. Background soil samples were not collected. Laboratory leach tests were used to determine if metals might be released from mine waste material, which could provide additional insight to possible ground-water contamination.

1.5.4 Analytical Methods

The Analytical Sciences Laboratory at the University of Idaho performed all of the laboratory analyses using the following EPA-approved protocols and quality assurance standards:

Water Samples (acidified and unfiltered)—Total Recoverable Metal Screen (EPA Test 200.7).
Water Samples (acidified and unfiltered)—Arsenic (EPA Test 200.9), Lead (EPA Test 200.9), and Mercury (EPA Test 245.1).
Water Samples (raw and filtered 0.45 micron filter)—Dissolved Metal Screen (EPA Test 200.7).
Soil and Waste Material—Element Screen (EPA Test 3050/6010).
Leachable Metals, TCLP—Metal Screen (EPA Test 1311/6010).

1.5.5 Standards

EPA and various state agencies have developed human health and environmental standards for various metals. In an attempt to put the metal concentrations that were measured into some perspective, they were compared to these developed standards. However, it is understood that the background metal concentrations in mineralized areas may exceed these standards.

1.5.5.1 Water-Quality Standards

The Safe Drinking Water Act (SDWA) directs EPA to develop standards for potable water. Some of these standards are mandatory (primary) and some are desired (secondary). The standards established under the SDWA are often referred to as primary and secondary maximum contaminant levels (MCLs). Similarly, the Clean Water Act (CWA) directs EPA to develop water-quality standards (acute and chronic) that will protect aquatic organisms. These standards may vary with water hardness and are often referred to as the Aquatic Life Standards. The primary and secondary MCLs along with the acute and chronic Aquatic Life Standards for selected metals are listed in Table 1.5-2. As these standards can vary with water hardness, a range of values is given for some elements. Hardness was not measured for this study.
Table 1.5-2. Standards for contaminants in water.

<table>
<thead>
<tr>
<th>Element</th>
<th>Primary MCL (mg/L)</th>
<th>Secondary MCL (mg/L)</th>
<th>Aquatic Life, Acute (mg/L)</th>
<th>Aquatic Life, Chronic (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>---</td>
<td>0.05-0.2</td>
<td>0.75</td>
<td>0.087</td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.05</td>
<td>---</td>
<td>0.36</td>
<td>0.19</td>
</tr>
<tr>
<td>Barium</td>
<td>2</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.005</td>
<td>---</td>
<td>0.004/0.009</td>
<td>0.001/0.002</td>
</tr>
<tr>
<td>Chromium</td>
<td>0.1</td>
<td>---</td>
<td>1.7/3.1</td>
<td>0.21/0.37</td>
</tr>
<tr>
<td>Copper</td>
<td>1.3</td>
<td>1</td>
<td>0.018/0.034</td>
<td>0.012/0.021</td>
</tr>
<tr>
<td>Iron</td>
<td>---</td>
<td>0.3</td>
<td>---</td>
<td>1</td>
</tr>
<tr>
<td>Lead</td>
<td>0.015</td>
<td>---</td>
<td>0.082/0.2</td>
<td>0.003/0.008</td>
</tr>
<tr>
<td>Manganese</td>
<td>---</td>
<td>0.05</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.002</td>
<td>---</td>
<td>0.0024</td>
<td>0.000012</td>
</tr>
<tr>
<td>Nickel</td>
<td>0.1</td>
<td>---</td>
<td>1.4/2.5</td>
<td>0.16/0.28</td>
</tr>
<tr>
<td>Zinc</td>
<td>---</td>
<td>5</td>
<td>0.12/0.21</td>
<td>0.11/0.19</td>
</tr>
</tbody>
</table>

1.5.5.2 Soil and Rock Background Standards

It is useful to have some idea about the natural background values of rocks and soils when interpreting geochemical data. Although no whole rock or soil samples were run for this study, an estimate can be made from the analyses presented by Gott and Cathall (1980). They analyzed both rock samples from the parent formation and soil samples from above the parent material. The median results from these analyses are presented in Tables 1.5-3 and 1.5-4, which show data for the Prichard, Burke, Revett, St. Regis, and Wallace Formations. These samples were analyzed by emission spectrophotometry, a much less accurate technique than we use today. However, due to the large number of analyses, the data is still useful, especially for estimating background values. For example, an average sample of soil above the Prichard Formation might contain 54 ppm (mg/Kg) lead, 140 ppm (mg/Kg) zinc, 21 ppm (mg/Kg) copper, 0.13 ppm (mg/Kg) mercury, and 10 ppm (mg/Kg) arsenic. These data were used by the Environmental Protection Agency as background data for their studies of the Bunker Hill Superfund Site (Nick Ceto, 1997, personal communication).

There are no federal standards for concentrations of metals and other constituents in soils; acceptable limits for such are often based on human and/or environmental risk assessments for an area. Since no assessments of this kind have been done, concentrations of metals in soils were
Table 1.5-3. Median values of metals in rock samples from various units of the Belt Supergroup (data from Gott and Cathrall, 1980; ppm = mg/Kg).

<table>
<thead>
<tr>
<th>Element</th>
<th>Prichard Formation</th>
<th>Burke Formation</th>
<th>Revett Formation</th>
<th>St. Regis Formation</th>
<th>Wallace Formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron (percent)</td>
<td>3</td>
<td>1.8</td>
<td>1.4</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Magnesium (percent)</td>
<td>0.4</td>
<td>0.1</td>
<td>0.05</td>
<td>0.19</td>
<td>0.48</td>
</tr>
<tr>
<td>Calcium (percent)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.05</td>
</tr>
<tr>
<td>Titanium (percent)</td>
<td>0.3</td>
<td>0.19</td>
<td>0.13</td>
<td>0.19</td>
<td>0.21</td>
</tr>
<tr>
<td>Manganese (ppm)</td>
<td>224</td>
<td>386</td>
<td>381</td>
<td>600</td>
<td>360</td>
</tr>
<tr>
<td>Barium (ppm)</td>
<td>343</td>
<td>360</td>
<td>235</td>
<td>543</td>
<td>378</td>
</tr>
<tr>
<td>Beryllium (ppm)</td>
<td>1.3</td>
<td>---</td>
<td>---</td>
<td>0.9</td>
<td>0.89</td>
</tr>
<tr>
<td>Cobalt (ppm)</td>
<td>5</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>3.9</td>
</tr>
<tr>
<td>Chromium (ppm)</td>
<td>40</td>
<td>13</td>
<td>8.3</td>
<td>20</td>
<td>23.8</td>
</tr>
<tr>
<td>Molybdenum (ppm)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Nickel (ppm)</td>
<td>10</td>
<td>5.5</td>
<td>4.2</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Strontium (ppm)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Vanadium (ppm)</td>
<td>54</td>
<td>26</td>
<td>20</td>
<td>30</td>
<td>36</td>
</tr>
<tr>
<td>Sulfur (percent)</td>
<td>.01</td>
<td>0.007</td>
<td>0.006</td>
<td>0.007</td>
<td>0.009</td>
</tr>
<tr>
<td>Mercury (ppm)</td>
<td>.03</td>
<td>---</td>
<td>0.03</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Copper (ppm)</td>
<td>22</td>
<td>6.2</td>
<td>8</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Lead (ppm)</td>
<td>34</td>
<td>14</td>
<td>10</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>Zinc (ppm)</td>
<td>60</td>
<td>31</td>
<td>15</td>
<td>20</td>
<td>41</td>
</tr>
<tr>
<td>Silver (ppm)</td>
<td>0.4</td>
<td>0.36</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Cadmium (ppm)</td>
<td>0.5</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Arsenic (ppm)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Antimony (ppm)</td>
<td>109</td>
<td>1.1</td>
<td>1.6</td>
<td>2.2</td>
<td>1.1</td>
</tr>
<tr>
<td>No. of Samples</td>
<td>727</td>
<td>402</td>
<td>455</td>
<td>839</td>
<td>998</td>
</tr>
</tbody>
</table>
Table 1.5-4. Median values of metals in soil samples from various units of the Belt Supergroup (data from Gott and Cathrall, 1980; ppm = mg/Kg).

<table>
<thead>
<tr>
<th>Element</th>
<th>Prichard Formation</th>
<th>Burke Formation</th>
<th>Revett Formation</th>
<th>St. Regis Formation</th>
<th>Wallace Formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron (percent)</td>
<td>3.1</td>
<td>3.3</td>
<td>3.8</td>
<td>3.7</td>
<td>3.7</td>
</tr>
<tr>
<td>Magnesium (percent)</td>
<td>0.61</td>
<td>0.60</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Calcium (percent)</td>
<td>0.57</td>
<td>0.59</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Titanium (percent)</td>
<td>0.56</td>
<td>0.49</td>
<td>0.5</td>
<td>0.5</td>
<td>0.4</td>
</tr>
<tr>
<td>Manganese (ppm)</td>
<td>1,285</td>
<td>1,373</td>
<td>1,730</td>
<td>1,809</td>
<td>1,377</td>
</tr>
<tr>
<td>Barium (ppm)</td>
<td>647</td>
<td>647</td>
<td>616</td>
<td>684</td>
<td>586</td>
</tr>
<tr>
<td>Beryllium (ppm)</td>
<td>1.4</td>
<td>1.1</td>
<td>1</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Cobalt (ppm)</td>
<td>14</td>
<td>10</td>
<td>8.8</td>
<td>9.5</td>
<td>9.4</td>
</tr>
<tr>
<td>Chromium (ppm)</td>
<td>43</td>
<td>32</td>
<td>34</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>Molybdenum (ppm)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Niobium (ppm)</td>
<td>9</td>
<td>9</td>
<td>---</td>
<td>---</td>
<td>8</td>
</tr>
<tr>
<td>Nickel (ppm)</td>
<td>29</td>
<td>21</td>
<td>20</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Strontium (ppm)</td>
<td>159</td>
<td>178</td>
<td>157</td>
<td>164</td>
<td>154</td>
</tr>
<tr>
<td>Vanadium (ppm)</td>
<td>98</td>
<td>90</td>
<td>97</td>
<td>90</td>
<td>94</td>
</tr>
<tr>
<td>Mercury (ppm)</td>
<td>0.13</td>
<td>0.09</td>
<td>0.08</td>
<td>0.1</td>
<td>0.13</td>
</tr>
<tr>
<td>Copper (ppm)</td>
<td>21</td>
<td>20</td>
<td>29</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Lead (ppm)</td>
<td>54</td>
<td>35</td>
<td>41</td>
<td>39</td>
<td>45</td>
</tr>
<tr>
<td>Zinc (ppm)</td>
<td>140</td>
<td>89</td>
<td>77</td>
<td>86</td>
<td>115</td>
</tr>
<tr>
<td>Silver (ppm)</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Cadmium (ppm)</td>
<td>1.3</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Arsenic (ppm)</td>
<td>10</td>
<td>8.6</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Antimony (ppm)</td>
<td>1</td>
<td>1</td>
<td>1.8</td>
<td>1.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Sulfur (percent)</td>
<td>0.029</td>
<td>0.035</td>
<td>0.053</td>
<td>0.049</td>
<td>0.046</td>
</tr>
<tr>
<td>No. of Samples</td>
<td>1,705</td>
<td>573</td>
<td>699</td>
<td>1,586</td>
<td>2,298</td>
</tr>
</tbody>
</table>
compared to the limits postulated by the U.S. EPA for the Clark Fork Superfund site (Table 1.5-5). The proposed upper limit for lead in soils is 1,000 mg/Kg to 2,000 mg/Kg, and 80 to 100 mg/Kg for arsenic in residential areas.

Table 1.5-5. Clark Fork Superfund background levels for selected elements.

<table>
<thead>
<tr>
<th>Material</th>
<th>As (mg/Kg)</th>
<th>Cd (mg/Kg)</th>
<th>Pb (mg/Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Mean Soil</td>
<td>6.7</td>
<td>0.7</td>
<td>20.0</td>
</tr>
<tr>
<td>Helena Valley Mean Soil</td>
<td>16.5</td>
<td>0.2</td>
<td>11.5</td>
</tr>
<tr>
<td>Missoula Lake Bed Sediments</td>
<td>n.a.</td>
<td>0.2</td>
<td>34.0</td>
</tr>
<tr>
<td>Blackfoot River</td>
<td>4.0</td>
<td>&lt;0.1</td>
<td>n.a.</td>
</tr>
<tr>
<td>Phytotoxic Concentration</td>
<td>100.0</td>
<td>100.0</td>
<td>1,000.0</td>
</tr>
</tbody>
</table>

1.5.6 Analytical Results

The results of the sample analyses were used to estimate the nature and extent of potential impacts to the environment and human health. Selected results for each site are presented in the discussion; a complete listing of water quality, soil chemistry, and leach test results are presented in Appendix C. It should be noted that the sampling for this study was of a reconnaissance nature only, sufficient for outlining possible problem areas for future study. Sampling density was not sufficient to provide a statistically valid description of any specific site.

The data fields in the current database are presented in Appendix B, and the format (dBase IV) is compatible with the widely used ARC/INFO Geographical Information System (GIS). In addition, all of the field observations and analytical data were entered into a Paradox database, which is compatible with other studies under way by the U.S. Forest Service.

1.5.7 Sample and Site Identification Numbers

All water, tailings, and dump samples were assigned unique numbers. These were constructed according to the following system: 1) an initial letter code identifying the person who took the sample (usually the first letter of the last name); 2) one or two digits for the month (some sample numbers contain a leading zero); 3) two digits for the day on which the sample was taken; 4) the last two digits in the year in which the sample was taken (i.e., “97,” if the samples was taken in 1997); and 5) one to three digits, including leading zeros, identifying the individual sample. Site numbers for properties that did not have a database identification number assigned to them were generated in the same manner.
2.0 COEUR D'ALENE RIVER DRAINAGE SURROUNDING THE COEUR D'ALENE MINING DISTRICT (Part 2 of the discussion of the Coeur d'Alene basin excluding Prichard Creek and Eagle Creek drainages)

2.1 INTRODUCTION

This report describes 132 secondary and minor properties in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district, excluding the drainages of Prichard and Eagle creeks. Only three properties discussed in this volume reported any production, and only one company out of those three had more than 50 tons of total output. The study area extends from the Montana border on the east to Coeur d'Alene Lake on the west and includes Kootenai County north of the Coeur d'Alene River and Shoshone County north of the southern drainage divide for the South Fork of the Coeur d'Alene River. Access to the area is by paved and unpaved roads from the major highways. Interstate 90 provides access to the southern part of the area, and U.S. Highway 95 is near the western boundary. Most of the secondary drainages have dirt roads, especially those with past mining activity.

The study area is in the Wallace and Fernan Districts of the Panhandle National Forest, and most of the land is administered by the U.S. Forest Service (USFS). There are enclaves of private land, mostly on patented mining claims.

The 132 mines and prospects described in this report are located on twenty-three 7.5-minute topographic maps (U.S. Geological Survey). The location of these properties is shown in Figure 2.1-1. Elevations in the study area range from 2,125 feet at Coeur d'Alene Lake to over 6,500 feet on the Idaho-Montana border. The area is heavily forested with dense brush and conifers, and the topography is generally very steep.

2.1.1 Summary of the Coeur d'Alene River Basin Study Area

There were 154 mining properties (Table 2.1.1-1 and Part 1 of this report [Kauffman and others, 1998]) examined in the Coeur d'Alene River basin surrounding the Coeur d'Alene mining district. The twenty-two sites with the most significant environmental problems are discussed in Part 1 (Volume III). These properties had either significant environmental problems (usually acid water, high metal loadings in the water, or old mill tailings) or physical hazards (open adits, tunnels, shafts, or pits). The properties with less serious environmental problems or with only physical hazards are covered in this volume (Volume V, Sections A through D).

Of the 132 mines in the Coeur d'Alene River drainage discussed in Part 2 (Volume V, Sections A through D), forty-seven have the potential to have an environmental impact on or near USFS lands. Fifteen of these properties have waste dumps in active waterways, twenty-six sites have water discharges that exceed one or more water quality standards, and six properties have both water quality concerns and waste rock impinging on an active waterway.

Of the thirty-one sites discussed in this section of the report (Section A of Volume V), eighteen have the potential to have an environmental impact on or near USFS lands. Of these sites, seven
Figure 2.1-1b. Location of properties in the southwest part of the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (U.S. Geological Survey St. Maries 1:100,000-scale map). Properties for all four sections of this volume are shown on Figures 2.1-1a–2.1-1d.
Figure 2.1-1c. Location of properties in the northeast part of the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (U.S. Geological Survey Thompson Falls 1:100,000-scale map). Properties for all four sections of this volume are shown on Figures 2.1-1a–2.1-1d.
Table 2.1-1. Summary of the secondary and minor sites in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard and Eagle Creek drainages). The properties are arranged in the order they are discussed in the text, approximately in relative order of importance regarding environmental concerns and/or physical hazards. Properties shown in gray are discussed in Sections B, C, and D of this volume.

Explanation:

Site No.: Idaho Geological Survey file number, or field designation number.
Surface Owner: FS = Forest Service; P = Private; M = mixed Forest Service/Private, or undetermined.
Water/Solid Sample: numbers indicate the number of samples collected.
Environmental Concerns: W = adit water; D = waste dump; T = tailings. Environmental concerns are noted as follows: W - samples of adit water or seeps from waste dumps that exceed one or more water quality standards in the Dissolved Metals Screen, the Total Recoverable Metals Screen, or the arsenic, lead or mercury tests; T or D - tailings or dump samples that exceed background or environmental standards for one or more elements in the Element Screen, and/or tailings or dump samples that show significant leaching of one or more metals in the TCLP for Metals Screen.
Physical Conditions: AO = open adit; AG = open adit, gated; AG(O) = open adit, gated, gate open; AC = caved or otherwise closed adit; SO = open shaft; SC = caved shaft; StO = open stope; T = trench or dozer cut; P = prospect pit. Numbers indicate number of each type of working at the site; queried when type or condition of workings uncertain or unknown.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Mine/Prospect Name</th>
<th>Surface Owner</th>
<th>Water Sample</th>
<th>Solid Sample</th>
<th>Environmental Concerns</th>
<th>Physical Conditions</th>
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<tbody>
<tr>
<td>SP-117</td>
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<td>D</td>
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Table 2.1-1 (continued). Summary of the secondary and minor sites in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard and Eagle Creek drainages).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Mine/Prospect Name</th>
<th>Surface Owner</th>
<th>Water Sample</th>
<th>Solid Sample</th>
<th>Environmental Concerns</th>
<th>Physical Conditions</th>
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<tbody>
<tr>
<td>WL-433</td>
<td>Beacon Light Mine, No. 2 adit</td>
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<td>W</td>
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<td>WL-182</td>
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<td>WL-258</td>
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<td>Carbonate Hill</td>
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</table>
Table 2.1-1 (continued). Summary of the secondary and minor sites in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard and Eagle Creek drainages).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Mine/Prospect Name</th>
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<th>Water Sample</th>
<th>Solid Sample</th>
<th>Environmental Concerns</th>
<th>Physical Conditions</th>
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<td>WL-467</td>
<td>Copper Queen</td>
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<td>Twin Gulch Prospect</td>
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<td>Dobson Pass Prospect</td>
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<td>W</td>
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Table 2.1-1 (continued). Summary of the secondary and minor sites in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard and Eagle Creek drainages).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Mine/Prospect Name</th>
<th>Surface Owner</th>
<th>Water Sample</th>
<th>Solid Sample</th>
<th>Environmental Concerns</th>
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<td>D (-04)</td>
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Table 2.1-1 (continued). Summary of the secondary and minor sites in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard and Eagle Creek drainages).

<table>
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<tr>
<th>Site No.</th>
<th>Mine/Prospect Name</th>
<th>Surface Owner</th>
<th>Water Sample</th>
<th>Solid Sample</th>
<th>Environmental Concerns</th>
<th>Physical Conditions</th>
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<td>Ordway Tungsten Mine</td>
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<td>SP-36</td>
<td>Buckles Prospect</td>
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<td>SP-37</td>
<td>Rock City Mine</td>
<td>FS</td>
<td></td>
<td></td>
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<td>1T or P</td>
</tr>
<tr>
<td>SP-38</td>
<td>Two Brothers Prospect</td>
<td>FS</td>
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<td></td>
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<td>1AC</td>
</tr>
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<td>1T</td>
</tr>
<tr>
<td>SP-40</td>
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<td></td>
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<tr>
<td>SP-41</td>
<td>RM Prospect</td>
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<td>SP-44</td>
<td>Lower Property Prospect</td>
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<td></td>
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<td>2-3P 1T</td>
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<td>SP-48</td>
<td>Big Elk Group</td>
<td>FS</td>
<td></td>
<td></td>
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<td>1AO 1T</td>
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<td>Unnamed Prospect, trib. to Short Creek, Spyglass Pk. 7.5</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>2T 2P</td>
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<tr>
<td>SP-57</td>
<td>Hamburg-American Prospect</td>
<td>M</td>
<td></td>
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<td>SP-61</td>
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<td>FS</td>
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<td>1SC</td>
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<td>SP-83</td>
<td>Kootenai King Prospect</td>
<td>FS</td>
<td></td>
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<td>4T?</td>
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<td>SP-92</td>
<td>Lost Cabin Prospect</td>
<td>FS</td>
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<td>3T or 3AC?</td>
</tr>
<tr>
<td>SP-98</td>
<td>Blue Fox</td>
<td>FS</td>
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<tr>
<td>SP-101</td>
<td>McGillivray Prospect</td>
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<tr>
<td>SP-102</td>
<td>Blue Jay</td>
<td>FS</td>
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<td></td>
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<tr>
<td>SP-397</td>
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<td></td>
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<td>1SC?</td>
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<tr>
<td>SP-108</td>
<td>King Solomon Prospect</td>
<td>FS</td>
<td></td>
<td></td>
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<td>1AC</td>
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Table 2.1-1 (continued). Summary of the secondary and minor sites in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard and Eagle Creek drainages).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Mine/Prospect Name</th>
<th>Surface Owner</th>
<th>Water Sample</th>
<th>Solid Sample</th>
<th>Environmental Concerns</th>
<th>Physical Conditions</th>
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<tr>
<td>SP-115</td>
<td>Maine Standard</td>
<td>FS</td>
<td></td>
<td></td>
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<td>1AC?</td>
</tr>
<tr>
<td>SP-268</td>
<td>Silver Belt Prospect</td>
<td>M ?, P ?</td>
<td></td>
<td></td>
<td></td>
<td>1T</td>
</tr>
<tr>
<td>SP-274</td>
<td>Wolfson Mine</td>
<td>M</td>
<td>I</td>
<td></td>
<td></td>
<td>1AC</td>
</tr>
<tr>
<td>SP-284</td>
<td>Fahey Group</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1/7T</td>
</tr>
<tr>
<td>SP-309</td>
<td>Bonanza Gold</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>4T</td>
</tr>
<tr>
<td>WL-176</td>
<td>Capitol Silver-Lead No. 1</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1AC</td>
</tr>
<tr>
<td>WL-204</td>
<td>Silver Mint</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1AC?</td>
</tr>
<tr>
<td>WL-206</td>
<td>Best Chance</td>
<td>FS</td>
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<td></td>
<td></td>
<td>1AC</td>
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<tr>
<td>WL-213</td>
<td>Belmont Mine</td>
<td>FS</td>
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<tr>
<td>WL-220</td>
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<tr>
<td>WL-228</td>
<td>Temple Mining Company, Ltd.</td>
<td>M</td>
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<td>WL-240</td>
<td>Homestake Silver-Lead Prospect</td>
<td>M</td>
<td></td>
<td></td>
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<tr>
<td>WL-277</td>
<td>Burke Property Prospect</td>
<td>FS</td>
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<td>1AC</td>
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<tr>
<td>WL-282</td>
<td>Champion Gold and Silver Mine</td>
<td>M</td>
<td>1</td>
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<td>1AC</td>
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<tr>
<td>WL-292</td>
<td>Silverore-Inspiration</td>
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<td>1AG</td>
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<tr>
<td>WL-417</td>
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<tr>
<td>WL-450, B8059706</td>
<td>Carney Prospect</td>
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<td>3 or 4 AC 1P</td>
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<tr>
<td>WL-451</td>
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<tr>
<td>WL-453</td>
<td>Pioneer Mines, Inc.</td>
<td>FS</td>
<td>1</td>
<td>W?</td>
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<tr>
<td>WL-456</td>
<td>Idaho Copper</td>
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<tr>
<td>WL-461</td>
<td>Helvetia Prospect</td>
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<td>1</td>
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<tr>
<td>WL-465</td>
<td>Nonpareil Group</td>
<td>FS</td>
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<td>several P, T</td>
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</table>
Table 2.1-1 (continued). Summary of the secondary and minor sites in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard and Eagle Creek drainages).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Mine/Prospect Name</th>
<th>Surface Owner</th>
<th>Water Sample</th>
<th>Solid Sample</th>
<th>Environmental Concerns</th>
<th>Physical Conditions</th>
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<tr>
<td>WL-468</td>
<td>Tillicum Prospect</td>
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<td>WL-470</td>
<td>Placer Creek Prospect</td>
<td>FS</td>
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<td>1</td>
<td>D</td>
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<td>1AC</td>
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<td>B7189705</td>
<td>Unnamed Prospect, Terror Gulch, Kellogg East 7.5</td>
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<td></td>
<td>1AC</td>
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<tr>
<td>K07229704</td>
<td>Unnamed Prospect, E. Fork of Hayden Creek, Spades Mtn. 7.5</td>
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<td></td>
<td></td>
<td></td>
<td>IT</td>
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<td>K07239701</td>
<td>Unnamed Prospect, trib. of Lewelling Creek, Spades Mtn. 7.5</td>
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<td>K07299701</td>
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<td>2</td>
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<td></td>
<td>1AC</td>
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<tr>
<td>K08069703</td>
<td>Unnamed Prospect, W. Fork of Big Creek, Polaris Peak 7.5</td>
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<td>1</td>
<td>W</td>
<td></td>
<td>1AC</td>
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<tr>
<td>K08069706</td>
<td>Unnamed Prospect, W. Fork of Big Creek, Polaris Peak 7.5</td>
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<td>SP-286</td>
<td>National Mine, unnamed adit (K08079708)</td>
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<td>1AC</td>
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<tr>
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<td>M</td>
<td></td>
<td></td>
<td></td>
<td>1P</td>
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</table>
Table 2.1-1 (continued). Summary of the secondary and minor sites in the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard and Eagle Creek drainages).

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Mine/Prospect Name</th>
<th>Surface Owner</th>
<th>Water Sample</th>
<th>Solid Sample</th>
<th>Environmental Concerns</th>
<th>Physical Conditions</th>
</tr>
</thead>
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<td>B8139706</td>
<td>Unnamed Prospect, Military Gulch, Burke 7.5</td>
<td>FS</td>
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<td></td>
<td>IP</td>
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<td>B8139708</td>
<td>Unnamed Prospect, Military Gulch, Burke 7.5</td>
<td>FS</td>
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<td>1AC</td>
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<tr>
<td>K08199711</td>
<td>Unnamed Prospect, Sonora Gulch, Burke 7.5</td>
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<td>D</td>
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<td>1AC</td>
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<td>M</td>
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<td></td>
<td>1AC</td>
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<tr>
<td>K08209702, K08209703</td>
<td>Unnamed Prospects, Sonora Gulch, Burke 7.5</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>1AC, IP</td>
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<tr>
<td>K08209704</td>
<td>Unnamed Prospect, Canyon Creek, Burke 7.5</td>
<td>M</td>
<td>1</td>
<td>1</td>
<td></td>
<td>2AC? or 2T</td>
</tr>
<tr>
<td>WL-272</td>
<td>Sonora Prospect</td>
<td>M</td>
<td>1</td>
<td>1</td>
<td>D, W</td>
<td>2AO, 1AC</td>
</tr>
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</table>
have dumps that impinged on active waterways, nine have water discharges that exceed one or more water quality standards, and two have both water quality concerns and waste rock impinging on an active waterway.

Forty-seven properties discussed in Volume V have open adits or shafts. An additional eight properties have gated openings. Some of the gates are secure, but others could be circumvented by someone determined to enter the adit. Of the thirty-one properties discussed in Section A of Volume V, twenty-three have open adits or shafts. Three more have gated openings. Of these, one gate was open at the time of the site inspection, one appeared secure, and the third gate had a narrow opening above it which could be used to enter the adit.

2.2 GEOLOGY

The most recent general references on the geology of the Coeur d'Alene River basin are Griggs (1973) and Harrison and others (1986). The geology and ore deposits of parts of the area are discussed in Anderson (1940) and Hobbs and others (1965). Additional references include Ransome (1904), Ransome and Calkins (1908), Umpleby and Jones (1923), and Fryklund (1964). Gott and Cathrall (1980) discuss the geochemistry of the Coeur d'Alene district. The geology and mineral deposits of the western part of the drainage are discussed in Anderson (1940). A brief description of the geologic framework of the area follows.

The metal mines in the district are hosted by metasedimentary rocks of the Belt Supergroup of Precambrian age (Figure 2.2-1). The characteristics of the various units comprising the supergroup are shown in Table 3.2.1. One group of mines in the study area are lead-zinc-silver deposits in the Prichard Formation. This formation is broken into an upper and lower part by Hosterman (1956) and Harrison and others (1986). Key references to the Prichard are Cressman (1982) and Cressman (1989). Other important groups of mines include stratabound copper-silver deposits located near the contact between the Revett and St. Regis Formations and lead-silver-zinc deposits located in the transition zone between the Prichard and Burke Formations (Bennett, 1984; Mitchell and Bennett, 1983). Some of the deposits are located in the Wallace Formation.

Igneous rocks include several Cretaceous or Tertiary granitic intrusives near the western edge of the area (Anderson, 1940) and the Gem stocks in the vicinity of Ninemile Creek. Some of the mines in the area are associated with these granitic rocks.

A series of northwest-trending strike-slip faults, including the Thompson Pass, Osburn, and Kellogg faults, are part of the Lewis and Clark line. The Osburn fault separates the Coeur d'Alene district into two halves and follows the South Fork of the Coeur d'Alene River near the southern boundary of the study area. North of the Kellogg fault, a series of faults that trend north-south marks the southern end of the Purcell trench. Folds generally trend north-south or west-northwest, mimicking better known structures in the Coeur d'Alene mining district. The Dobson Pass fault is a major structure that separates the Prichard Formation from the Wallace Formation in the central part of the study area and is a continuation of a major fault that extends up Ninemile Creek north of Wallace, Idaho.
Figure 2.2-1a. Geology of the western part of the Coeur d'Alene River drainage, Idaho (Griggs, 1973). pCQd = Middle Proterozoic quartz diorite or amphibolite; pCp, pCpu, pCpl, pCdp = Middle Proterozoic Prichard Formation; pCbb = Middle Proterozoic Burke Formation; pCcr = Middle Proterozoic Revett Formation; pCrb = Middle Proterozoic Revett and Burke Formations, undivided; pCw, pCwu, pCwl = Middle Proterozoic Wallace Formation; pCsp = Middle Proterozoic Striped Peak Formation; pCgl = Middle Proterozoic Libby Formation; Crg = Rennie Shale and Gold Creek Quartzite; Cl = Lakeview Limestone; TMg = Tertiary and Mesozoic granitic rocks; Td = Miocene and Pliocene Columbia River Basalt and Latah Formation; QTg = Tertiary and Quaternary older gravel deposits; Qp = Pleistocene Palouse Formation; Qgo = Pleistocene older glacial deposits; Ogf = Pleistocene glacial flood deposits; Ogx = Pleistocene younger glacial deposits; Qts = Quaternary landside deposits; Qal = Holocene alluvium. Properties for all four sections of this volume are shown on Figures 2.2-1a and 2.2-1b.
Figure 2.2-1b. Geology of the eastern part of the Coeur d'Alene River drainage, Idaho (Harrison and others, 1986). Ypu, Ypl = Middle Proterozoic Prichard Formation; Yb = Middle Proterozoic Burke Formation; Yr = Middle Proterozoic Revett Formation; Yw, Ywu, Ywm, Ywl = Middle Proterozoic Wallace Formation; Ysp = Middle Proterozoic Striped Peak Formation; ZYd = Late and Middle Proterozoic mafic dikes and sills; Ks, Kg = Cretaceous granitic rocks; QTg = Tertiary and Quaternary gravel deposits; Qg = Pleistocene glacial, fluvial and flood deposits; Ql = Quaternary lake sediments; Qal = Holocene alluvium. Properties for all four sections of this volume are shown on Figures 2.2-1a and 2.2-1b.
<table>
<thead>
<tr>
<th>Group</th>
<th>Formation</th>
<th>Lithology</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missoula</td>
<td>Striped Peak Formation</td>
<td>Interbedded quartzite and argillite with some arenaceous dolomitic beds. Purplish gray and pink to greenish gray. Ripple marks, mud cracks common. Top eroded.</td>
<td>1,500+</td>
</tr>
<tr>
<td></td>
<td>Wallace Formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper part</td>
<td>Mostly medium- to greenish-gray finely laminated argillite. Some arenaceous dolomite and impure quartzite, and minor gray dolomite and limestone in the middle part.</td>
<td>4,500-6,500</td>
</tr>
<tr>
<td></td>
<td>Lower part</td>
<td>Light-gray more or less dolomitic quartzite interbedded with greenish-gray argillite. Ripple marks, mud cracks abundant.</td>
<td></td>
</tr>
<tr>
<td>Ravalli</td>
<td>St. Regis Formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper part</td>
<td>Light greenish-yellow to light green-gray argillite; thinly laminated. Some carbonate-bearing beds.</td>
<td>1,400-2,000</td>
</tr>
<tr>
<td></td>
<td>Lower part</td>
<td>Gradational from thick-bedded pure quartzite at base to interbedded argillite and impure quartzite at top. Red-purple color characteristic; some green-gray argillite. Some carbonate-bearing beds. Ripple marks, mud cracks, and mud-chip breccia common.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Revett Quartzite</td>
<td>Thick-bedded vitreous light yellowish-gray to nearly white pure quartzite. Grades into nearly pure and impure quartzite at bottom and top. Cross-stratification common.</td>
<td>1,200-3,400</td>
</tr>
<tr>
<td></td>
<td>Burke Formation</td>
<td>Light greenish-gray impure quartzite. Some pale red and light yellowish-gray pure to nearly pure quartzite. Ripple marks, swash marks, and pseudo-conglomerate.</td>
<td>2,200-3,000</td>
</tr>
<tr>
<td></td>
<td>Pritchard Formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper part</td>
<td>Interbedded medium-gray argillite and quartzose argillite and light-gray impure to pure quartzite. Some mud cracks and ripple marks.</td>
<td>12,000+</td>
</tr>
<tr>
<td></td>
<td>Lower part</td>
<td>Thin- to thick-bedded, medium gray argillite and quartzose argillite; laminated in part. Pyrite abundant. some discontinuous quartzite zones. Base buried.</td>
<td></td>
</tr>
</tbody>
</table>
2.3 **ECONOMIC GEOLOGY**

2.3.1 General Characteristics of the Ore

The metal mines in the district are hosted by metasedimentary rocks of the Belt Supergroup of Precambrian age (Figure 2.2-1). Most of the mines in the study area are lead-zinc-silver deposits, sometimes containing copper and gold. Host rocks include all formations of the Belt Supergroup. The ore veins have variously been described as hydrothermal deposits (Umpleby and Jones, 1923; Fryklund, 1964) or as mobilized syngenetic stratabound deposits (Hershey, 1916; Bennett, 1984). The veins may have been filled as late as the Cretaceous (Fleck and others, 1991; Eaton and others, 1993). Sphalerite, galena, pyrite, and pyrrhotite are commonly found in these deposits (Fryklund, 1964; Umpleby and Jones, 1923). Only three of the properties discussed in this volume reported any production. Of the three properties, only one produced more than 50 tons of ore.

2.3.2 Summary of Mill Development

All of the mines that had associated mills were discussed in Volume III (Part 1 of this report), which covers the Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district but excluding the Prichard Creek and Eagle Creek drainages. This volume (Part 2 of the discussion of the Coeur d'Alene River drainage) covers the smaller properties, which did not have associated mills.

2.4 **HYDROLOGY AND HYDROGEOLOGY**

The study area includes all of the drainage of the Coeur d'Alene River, except the drainages of Prichard and Eagle creeks (which are covered in Volumes I and IV of this report; see Appendix E). Prichard Creek flows into the Coeur d'Alene River at Prichard. The major drainages in the area (Figures 2.1-1 and 2.1-2) are the Coeur d'Alene River (which forms the southern boundary of the western half of the study area) and the North Fork of the Coeur d'Alene River. The South Fork of the Coeur d'Alene River, which drains the Coeur d'Alene mining district (most of which is not Forest Service land), flows into the Coeur d'Alene River west of Enaville. In the eastern part of the area, the southern boundary of the study area follows the drainage divide of the South Fork of the Coeur d'Alene River.

As noted, a number of the lead-zinc mines in the study area are hosted by rocks of the Prichard Formation. In places these rocks contain visible sulfides (primarily pyrite and pyrrhotite). These rocks also contain significantly higher values of base metals than some of the other Belt rocks. Table 1.5-3 (based on 727 samples) shows that rocks in the Prichard Formation contain 60 ppm zinc, 34 ppm lead, 3 percent iron, 22 ppm copper, and 0.5 percent cadmium, and soils above the Prichard reflect this metal content (Table 1.5-4 based on 1,705 samples) with 140 ppm zinc, 54 ppm lead, 3.1 percent iron, 21 ppm copper, 1.3 ppm cadmium, and 10 ppm arsenic. Tables 1.5-3 and 1.5-4 show similar data for the other formations in the Belt Supergroup.
To test whether the high metal content from the Belt Supergroup, especially the Prichard Formation, was impacting stream waters, eight reference water samples were collected. The chemical analyses for these samples are shown in Tables 2.4-1 and 2.4-2, along with water quality standards suggested by the Environmental Protection Agency (EPA). The following reference water samples were collected:

- B7169711 — East Fork of Twomile Creek
- B7169712 — Ninemile Creek
- B7259704 — Daisy Gulch
- K07299704 — headwaters of Stewart Creek
- R07309701 — Lost Man Creek
- R08069702 — Big Creek
- R08119701 — Varnum Creek
- R72297001 — Beauty Creek

Of these eight samples, only R08119701 was below all EPA standards for all elements. In the total recoverable metals screen, samples B7169712, K07299704, R07309701, and R08069702 exceed all standards for cadmium, samples B7259704 and R72297001 exceed the Aquatic Life Chronic standard and are within the range of the Aquatic Life Acute standard for cadmium, and sample B7169711 exceeds the Aquatic Life Chronic standard for cadmium. In the dissolved metals screen, sample B7169712 exceeds all standards for cadmium, and samples R07309701 and R72297001 exceed the Aquatic Life Chronic standard for cadmium.

In addition, sample B7169712 exceeds both Aquatic Life standards for zinc in the total recoverable metals and the dissolved metals screens. In the dissolved metals screen, samples K07299704 and R07309701 exceed the Aquatic Life Chronic standard and are within the range of the Aquatic Life Acute standard for copper, sample R72297001 is within the range of the Aquatic Life Chronic standard for copper, and sample R08069702 is at the lower limit of the Aquatic Life Chronic standard for copper.

2.5 SUMMARY OF THE COEUR D'ALENE RIVER DRAINAGE

2.5.1 Summary of Environmental Observations

Most, but not all, samples which significantly exceed EPA water standards are from the larger mines in the area (Tables 2.5-1 and 2.5-2). Water quality variances include significant amounts of zinc from the Silver Cable Mine and lesser amounts of copper from the Beacon Light Mine and the Central and Little Giant Prospects (Atlas Mine). Cadmium in excess of one or more water quality standards is the most prevalent water quality variance in the Coeur d'Alene River drainage; in nearly half of these samples, cadmium is the only element that exceeds any standard. Most of the elements detected in the water samples are also found in the rock units underlying the drainages.
Table 2.4-1. Dissolved metals screen for reference samples from the Coeur d’Alene River drainage surrounding the Coeur d’Alene mining district (excluding the drainages of Prichard and Eagle Creeks).

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>REMARKS</th>
<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7169711</td>
<td>East Fork of Twomile Creek</td>
<td>---</td>
<td>0.0720</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.0053</td>
<td></td>
</tr>
<tr>
<td>B7169712</td>
<td>Nine Mile Creek</td>
<td>---</td>
<td>0.0200</td>
<td>0.0180</td>
<td>0.0080</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.0310</td>
<td>---</td>
<td>2.9000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B7259704</td>
<td>Daisy Gulch</td>
<td>---</td>
<td>0.0260</td>
<td>---</td>
<td>---</td>
<td>0.0100</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.0031</td>
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<td></td>
</tr>
<tr>
<td>K07299704</td>
<td>Stewart Creek, head</td>
<td>---</td>
<td>0.0056</td>
<td>---</td>
<td>0.0066</td>
<td>0.0200</td>
<td>0.0037</td>
<td>0.0031</td>
<td>0.020</td>
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</tr>
<tr>
<td>R07309701</td>
<td>Lost Man Creek</td>
<td>---</td>
<td>0.0099</td>
<td>0.0029</td>
<td>---</td>
<td>0.0180</td>
<td>0.0120</td>
<td>0.0039</td>
<td>0.021</td>
<td>0.0080</td>
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</tr>
<tr>
<td>R08069702</td>
<td>Big Creek</td>
<td>---</td>
<td>0.0220</td>
<td>---</td>
<td>---</td>
<td>0.0120</td>
<td>0.0057</td>
<td>0.0025</td>
<td>---</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>R08119701</td>
<td>Varnum Creek</td>
<td>---</td>
<td>0.0100</td>
<td>---</td>
<td>---</td>
<td>0.0097</td>
<td>0.1500</td>
<td>0.0180</td>
<td>---</td>
<td>0.0028</td>
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<td></td>
<td></td>
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<tr>
<td>R72297001</td>
<td>Beauty Creek</td>
<td>---</td>
<td>0.0100</td>
<td>0.0032</td>
<td>0.0055</td>
<td>0.0160</td>
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<td>---</td>
<td>0.016</td>
<td>0.013</td>
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</tbody>
</table>

**EXPLANATION**

Blank space equals no analysis

Below Detection Limit is ---

**WATER QUALITY STANDARDS**

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<thead>
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<th></th>
<th>Al (mg/L)</th>
<th>As (mg/L)</th>
<th>Ba (mg/L)</th>
<th>Cd (mg/L)</th>
<th>Cr (mg/L)</th>
<th>Cu (mg/L)</th>
<th>Fe (mg/L)</th>
<th>Pb (mg/L)</th>
<th>Mn (mg/L)</th>
<th>Hg (mg/L)</th>
<th>Ni (mg/L)</th>
<th>Zn (mg/L)</th>
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<td>Primary MCL</td>
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<td>0.050</td>
<td>0.002</td>
<td>0.100</td>
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<tr>
<td>Secondary MCL</td>
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<td>0.005</td>
<td>0.100</td>
<td>0.050</td>
<td>0.002</td>
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<td>5.000</td>
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<tr>
<td>Aquatic Life, Acute</td>
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<td>0.360</td>
<td>0.004-0.009</td>
<td>1.7-3.1</td>
<td>0.018-0.034</td>
<td>1.000</td>
<td>0.082-0.2</td>
<td>0.0024</td>
<td>1.4-2.5</td>
<td>0.12-0.21</td>
<td>0.11-0.19</td>
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</tr>
<tr>
<td>Aquatic Life, Chronic</td>
<td>0.087</td>
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<td>0.001-0.002</td>
<td>0.21-0.37</td>
<td>0.012-0.021</td>
<td>0.003-0.008</td>
<td>0.000012</td>
<td>0.016-0.28</td>
<td>0.011-0.19</td>
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<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.089</td>
<td>0.0029</td>
<td>0.0006</td>
<td>0.0023</td>
<td>0.0044</td>
<td>0.0084</td>
<td>0.0037</td>
<td>0.0015</td>
<td>0.0005</td>
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Table 2.4-2. Total metals screen for reference samples from the Coeur d’Alene River drainage surrounding the Coeur d’Alene mining district (excluding the drainages of Prichard and Eagle Creeks).

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<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
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<tbody>
<tr>
<td>B7169711</td>
<td>East Fork of Twomile Creek</td>
<td>0.076</td>
<td>0.003</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.006</td>
<td>0.03</td>
<td>—</td>
<td></td>
<td>0.3</td>
<td></td>
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</tr>
<tr>
<td>B7169712</td>
<td>Ninemile Creek</td>
<td>0.022</td>
<td>0.022</td>
<td>0.018</td>
<td>—</td>
<td>—</td>
<td>0.038</td>
<td>0.03</td>
<td>3.000</td>
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</tr>
<tr>
<td>B7259704</td>
<td>Daisy Gulch</td>
<td>0.026</td>
<td>0.005</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K07299704</td>
<td>Stewart Creek, head</td>
<td>0.006</td>
<td>0.006</td>
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<td>—</td>
<td>—</td>
<td>0.003</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R07309701</td>
<td>Lost Man Creek</td>
<td>0.010</td>
<td>0.006</td>
<td>—</td>
<td>—</td>
<td>0.016</td>
<td>0.004</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R08069702</td>
<td>Big Creek</td>
<td>0.028</td>
<td>0.006</td>
<td>—</td>
<td>—</td>
<td>0.006</td>
<td>0.03</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R08119701</td>
<td>Varnum Creek</td>
<td>0.009</td>
<td>—</td>
<td>—</td>
<td>0.220</td>
<td>0.016</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R72297001</td>
<td>Beauty Creek</td>
<td>0.010</td>
<td>0.004</td>
<td>—</td>
<td>—</td>
<td>0.032</td>
<td>0.002</td>
<td>—</td>
<td>0.051</td>
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</tr>
</tbody>
</table>

**EXPLANATION**

Blank space equals no analysis

Below Detection Limit is —

**WATER QUALITY STANDARDS**

<table>
<thead>
<tr>
<th></th>
<th>Al (mg/L)</th>
<th>As (mg/L)</th>
<th>Ba (mg/L)</th>
<th>Cd (mg/L)</th>
<th>Cr (mg/L)</th>
<th>Cu (mg/L)</th>
<th>Fe (mg/L)</th>
<th>Pb (mg/L)</th>
<th>Mn (mg/L)</th>
<th>Hg (mg/L)</th>
<th>Ni (mg/L)</th>
<th>Zn (mg/L)</th>
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</thead>
<tbody>
<tr>
<td>Primary MCL</td>
<td>0.050</td>
<td>2.000</td>
<td>0.005</td>
<td>0.100</td>
<td>0.050</td>
<td>0.002</td>
<td>1.000</td>
<td>0.300</td>
<td>0.050</td>
<td>1.000</td>
<td>5.000</td>
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<tr>
<td>Secondary MCL</td>
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<td>0.100</td>
<td>0.050</td>
<td>0.002</td>
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<td>0.300</td>
<td>0.050</td>
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<tr>
<td>Aquatic Life, Acute</td>
<td>0.750</td>
<td>0.360</td>
<td>0.004-0.009</td>
<td>1.7-3.1</td>
<td>0.018-0.034</td>
<td>1.000</td>
<td>0.082-0.2</td>
<td>0.0024</td>
<td>1.4-2.5</td>
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<td>Aquatic Life, Chronic</td>
<td>0.087</td>
<td>0.190</td>
<td>0.001-0.002</td>
<td>0.21-0.37</td>
<td>0.012-0.021</td>
<td>0.003-0.008</td>
<td>0.000012</td>
<td>0.16-0.28</td>
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**Estimated Detection Level (33% confidence)**

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<th>Cd (mg/L)</th>
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<th>Fe (mg/L)</th>
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Table 2.5-1. Dissolved metals in water samples from the minor properties in the Coeur d’Alene basin surrounding the Coeur d’Alene mining district. Numbers in bold exceed one or more water quality standards. Properties shown in gray are discussed in Sections B, C, and D of this volume.

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>REMARKS</th>
<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppb)</th>
<th>Hg (ppm)</th>
<th>Ni (ppb)</th>
<th>Zn (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7169701</td>
<td>Hudlow Mine (B7169701), adit</td>
<td>—</td>
<td>0.0480</td>
<td>0.0024</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.002</td>
<td>—</td>
<td>0.019</td>
<td>—</td>
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</tr>
<tr>
<td>B7169703</td>
<td>Unnamed location (B7169703), adit</td>
<td>—</td>
<td>0.0190</td>
<td>0.0024</td>
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<td>—</td>
<td>—</td>
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<td>0.002</td>
<td>—</td>
<td>0.014</td>
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</tr>
<tr>
<td>B7169704</td>
<td>Twomile Creek, downstream</td>
<td>—</td>
<td>0.02</td>
<td>0.0026</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.013</td>
<td>—</td>
<td>—</td>
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<tr>
<td>B7169709</td>
<td>May Claim Prospect (WL-263), adit</td>
<td>—</td>
<td>0.028</td>
<td>0.0024</td>
<td>—</td>
<td>—</td>
<td>1.9</td>
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<tr>
<td>B7179704</td>
<td>Silver Crescent Mine (SP-121), adit</td>
<td>—</td>
<td>0.0210</td>
<td>—</td>
<td>—</td>
<td>0.25</td>
<td>—</td>
<td>0.13</td>
<td>0.014</td>
<td>0.0210</td>
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<tr>
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<td>Moon Gulch, downstream from SP-121</td>
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<td>—</td>
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<tr>
<td>B7239702</td>
<td>Dado Peak Gulch, downstream</td>
<td>—</td>
<td>0.0330</td>
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<tr>
<td>B7309701</td>
<td>Beacon Light (WL-433), Adit #2</td>
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<td>0.0610</td>
<td>0.0025</td>
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<td>B8059702</td>
<td>Little Giant Prospect (WL-446), adit</td>
<td>—</td>
<td>0.1700</td>
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<td>B8069702</td>
<td>Central Prospect (WL-445), tributary</td>
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**EXPLANATION**

- Blank space equals no analysis
- Below Detection Limit is ---

**WATER QUALITY STANDARDS**

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<td>0.018-0.034</td>
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Table 2.5-1 (continued). Dissolved metals in water samples from the minor properties in the Coeur d'Alene basin surrounding the Coeur d'Alene mining district.

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<th>Mn (ppb)</th>
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**EXPLANATION**

Blank space equals no analysis

Below Detection Limit is —

**WATER QUALITY STANDARDS**

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<td>0.050</td>
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<td>0.082-0.2</td>
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<td>1.4-2.5</td>
<td>0.12-0.21</td>
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<tr>
<td>Aquatic Life, Acute</td>
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mg/L = ppm
Table 2.5-1 (continued). Dissolved metals in water samples from the minor properties in the Coeur d’Alene basin surrounding the Coeur d’Alene mining district.

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**EXPLANATION**

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<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
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EXPLANATION

Blank space equals no analysis
Below Detection Limit is ---

WATER QUALITY STANDARDS

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<th>Ba (mg/L)</th>
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<th>Cr (mg/L)</th>
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<th>Zn (mg/L)</th>
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<td>Secondary MCL</td>
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<td>2.00-0.25</td>
<td>0.004-0.009</td>
<td>1.7-3.1</td>
<td>0.018-0.034</td>
<td>1.000-2.00</td>
<td>0.0024</td>
<td>1.4-2.5</td>
<td>0.12-0.21</td>
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<td>Aquatic Life, Acute</td>
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<td>0.360</td>
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<td>1.4-2.5</td>
<td>0.12-0.21</td>
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Table 2.5-2. Total recoverable metals in water samples from the minor properties in the Coeur d’Alene River basin surrounding the Coeur d’Alene mining district. Numbers in bold exceed one or more water quality standards. Properties shown in gray are discussed in Sections B, C, and D of this volume.

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<th>FIELD NO.</th>
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<th>REMARKS</th>
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<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
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<th>Cu (ppm)</th>
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<th>Hg (ppm)</th>
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<td>0.005</td>
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<td>0.05</td>
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<tr>
<td>B7169703</td>
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<td>0.0210</td>
<td>0.006</td>
<td>0.016</td>
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<td>—</td>
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<td>0.007</td>
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<td>Twomile Creek, downstream</td>
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**EXPLANATION**

Blank space equals no analysis
Below Detection Limit is —

**WATER QUALITY STANDARDS**

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<th>Ni (mg/L)</th>
<th>Zn (mg/L)</th>
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Table 2.5-2 (continued). Total recoverable metals in water samples from the minor properties in the Coeur d’Alene River basin surrounding the Coeur d’Alene mining district.

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<th>Ba  (ppm)</th>
<th>Cd  (ppm)</th>
<th>Cr  (ppm)</th>
<th>Cu  (ppm)</th>
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<th>Pb  (ppm)</th>
<th>Mn  (ppm)</th>
<th>Hg  (ppm)</th>
<th>Ni  (ppm)</th>
<th>Zn  (ppm)</th>
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<tr>
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<td>unnamed prospect on West Fork of Big Creek (K08069703), adit</td>
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<td>0.540</td>
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<td>0.010</td>
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<tr>
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<td>0.0190</td>
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<td>0.017</td>
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<td>0.0340</td>
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EXPLANATION
Blank space equals no analysis
Below Detection Limit is --

WATER QUALITY STANDARDS

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<th>Cr  (mg/L)</th>
<th>Cu  (mg/L)</th>
<th>Fe  (mg/L)</th>
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<th>Mn  (mg/L)</th>
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<th>Ni  (mg/L)</th>
<th>Zn  (mg/L)</th>
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<td>0.018-0.034</td>
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<td>0.082-0.2</td>
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<td>0.12-0.21</td>
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<td>Aquatic Life, Chronic</td>
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Table 2.5-2 (continued). Total recoverable metals in water samples from the minor properties in the Coeur d'Alene River basin surrounding the Coeur d'Alene mining district.

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<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
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<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
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<td>East Fork Big Creek, downstream</td>
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<td>0.0330</td>
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<td>K08289702</td>
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EXPLANATION

Blank space equals no analysis
Below Detection Limit is ---

WATER QUALITY STANDARDS

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<th>Cu (mg/L)</th>
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<td>2.0000</td>
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<td>0.050</td>
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<td>1.000</td>
<td>0.082-0.2</td>
<td>0.0024</td>
<td>1.4-2.5</td>
<td>0.12-0.21</td>
<td>0.16-0.28</td>
<td>0.11-0.19</td>
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<tr>
<td>Aquatic Life, Acute</td>
<td>0.750</td>
<td>0.3600</td>
<td>0.001-0.002</td>
<td>0.21-0.37</td>
<td>0.012-0.021</td>
<td>0.003-0.008</td>
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Table 2.5-2 (continued). Total recoverable metals in water samples from the minor properties in the Coeur d’Alene River basin surrounding the Coeur d’Alene mining district.

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<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
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<th>Mn (ppm)</th>
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<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
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<td>K09169707</td>
<td>East Fork of Twomile Creek, downstream</td>
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EXPLANATION

Blank space equals no analysis

Below Detection Limit is —

WATER QUALITY STANDARDS

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<th>Ni (mg/L)</th>
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<td>Aquatic Life, Acute</td>
<td>0.750</td>
<td>0.3600</td>
<td>0.004</td>
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<td>Aquatic Life, Chronic</td>
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Estimated Detection Level (33% confidence)
2.5.2 Mine Waste Samples

Samples were collected from most of the properties where the mine waste dump impinged on an active waterway (Tables 2.5-3 and 2.5-4). As expected, many of these samples contain metal loadings, including arsenic, copper, lead, and zinc, which exceed the Clark Fork Superfund Background Levels. No samples of mill tailings were collected from the properties examined in this volume because no mills were operated on these properties.
Table 2.5-3. Element screen for dump samples for the minor properties in the Coeur d'Alene River basin surrounding the Coeur d'Alene mining district. Properties shown in gray are discussed in Sections B, C, and D of this volume.

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>REMARKS</th>
<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7179706</td>
<td>Royal Mine (SP-125), dump</td>
<td>NA</td>
<td>1,700.00</td>
<td>43</td>
<td>4.90</td>
<td>5.00</td>
<td>260</td>
<td>82,000</td>
<td>480</td>
<td>110</td>
<td>NA</td>
<td>23.00</td>
<td>230</td>
</tr>
<tr>
<td>B7239701</td>
<td>Washington-Idaho Mine (SP-117), Adit #1 dump</td>
<td>NA</td>
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<td>75</td>
<td>13.00</td>
<td>22.00</td>
<td>87</td>
<td>44,000</td>
<td>1,200</td>
<td>830</td>
<td>NA</td>
<td>60.00</td>
<td>1,100</td>
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<tr>
<td>B8069701</td>
<td>Central Prospect (WL-445), Adit #1 dump</td>
<td>NA</td>
<td>92.00</td>
<td>1,300</td>
<td>5.20</td>
<td>9.20</td>
<td>70</td>
<td>77,000</td>
<td>21,000</td>
<td>4,200</td>
<td>NA</td>
<td>24.00</td>
<td>60</td>
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<tr>
<td>B8069705</td>
<td>Gravel Pit, Willow Creek</td>
<td>NA</td>
<td>160.00</td>
<td>340</td>
<td>82.00</td>
<td>42.00</td>
<td>240</td>
<td>65,000</td>
<td>20,000</td>
<td>9,500</td>
<td>NA</td>
<td>32.00</td>
<td>11,000</td>
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<td>Lewis and Clark Group (WL-358), dump</td>
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<td>8.60</td>
<td>68</td>
<td>31,000</td>
<td>78</td>
<td>840</td>
<td>NA</td>
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<td>120</td>
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<td>3.70</td>
<td>18.00</td>
<td>840</td>
<td>19,000</td>
<td>8,600</td>
<td>170</td>
<td>NA</td>
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<td>52</td>
<td>580</td>
<td>NA</td>
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</tr>
<tr>
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<td>Unnamed prospect (K07179706), dump</td>
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<td>130</td>
<td>3.50</td>
<td>22.00</td>
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<td>63</td>
<td>400</td>
<td>NA</td>
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<td>140</td>
<td>3.40</td>
<td>5.20</td>
<td>48</td>
<td>49,000</td>
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<td>NA</td>
<td>22.00</td>
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<tr>
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<td>130.00</td>
<td>74</td>
<td>5.70</td>
<td>8.30</td>
<td>39</td>
<td>97,000</td>
<td>340</td>
<td>850</td>
<td>NA</td>
<td>25.00</td>
<td>150</td>
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<td>380.00</td>
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<td>4.90</td>
<td>10</td>
<td>20,000</td>
<td>27</td>
<td>500</td>
<td>NA</td>
<td>15.00</td>
<td>18</td>
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<tr>
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<td>Rainbow No. 2 Prospect (SP-55), dump, oxidized</td>
<td>NA</td>
<td>86.00</td>
<td>18</td>
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<td>3.10</td>
<td>190</td>
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<td>330</td>
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<td>NA</td>
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<td>1.20</td>
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<td>NA</td>
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<td>17.00</td>
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<td>NA</td>
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<td>15</td>
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<tr>
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<td>Rockford Group (SP-252), dump</td>
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<td>17,000</td>
<td>30</td>
<td>2,700</td>
<td>NA</td>
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<tr>
<td>K08189702</td>
<td>North Fork Mine (SP-77), Adit #2, dump</td>
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<td>5.80</td>
<td>38</td>
<td>17,000</td>
<td>37</td>
<td>1,000</td>
<td>NA</td>
<td>16.00</td>
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Clark Fork Superfund Background Levels (mg/Kg) = ppm

<table>
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<th></th>
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<th>Cd</th>
<th>Pb</th>
</tr>
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<tr>
<td>U.S. Mean Soil</td>
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<td>20.0</td>
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<tr>
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<td>16.5</td>
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<td>11.5</td>
</tr>
<tr>
<td>Missoula Lake Bed Sediments</td>
<td>NA</td>
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<td>34.0</td>
</tr>
<tr>
<td>Blackfoot River</td>
<td>4.0</td>
<td>&lt;0.1</td>
<td>NA</td>
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<td>Phytotoxic Concentration</td>
<td>100.0</td>
<td>100.0</td>
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Explanation

Below Detection Limit is —
Not analyzed equals NA
Table 2.5-3 (continued). Element screen for dump samples for the minor properties in the Coeur d'Alene River basin surrounding the Coeur d'Alene mining district.

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>REMARKS</th>
<th>Al (ppm)</th>
<th>As (ppm)</th>
<th>Ba (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Cu (ppm)</th>
<th>Fe (ppm)</th>
<th>Pb (ppm)</th>
<th>Mn (ppm)</th>
<th>Hg (ppm)</th>
<th>Ni (ppm)</th>
<th>Zn (ppm)</th>
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<tr>
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<td>1,200</td>
<td>12.0</td>
<td>12.0</td>
<td>39</td>
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<tr>
<td>K08269702</td>
<td>Highlands Aurora (WL-145), dump</td>
<td>NA</td>
<td>560</td>
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<td>6.80</td>
<td>84</td>
<td>11,000</td>
<td>1,600</td>
<td>1,300</td>
<td>16.0</td>
<td>15.0</td>
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<td></td>
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<tr>
<td>K08269705</td>
<td>Belmont-Banner Mine (WL-143), dump</td>
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<td>9.40</td>
<td>28</td>
<td>16,000</td>
<td>74</td>
<td>490</td>
<td>20.0</td>
<td>14.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K08269707</td>
<td>California Gulch Prospect (WL-94), dump</td>
<td>NA</td>
<td>130.00</td>
<td>170</td>
<td>4.60</td>
<td>15.00</td>
<td>51</td>
<td>27,000</td>
<td>230</td>
<td>1,100</td>
<td>28.0</td>
<td>540</td>
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<td>K09169705</td>
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<td>490</td>
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<td>23.0</td>
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<td>120</td>
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<td>39.00</td>
<td>230</td>
<td>59,000</td>
<td>100</td>
<td>1,000</td>
<td>67.0</td>
<td>120</td>
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<tr>
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<td>Helvetia Prospect (WL-461), dump</td>
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<td>3.00</td>
<td>25.00</td>
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<td>690</td>
<td>27.0</td>
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<tr>
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<td>28.00</td>
<td>170</td>
<td>71,000</td>
<td>110</td>
<td>1,200</td>
<td>74.0</td>
<td>160</td>
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<tr>
<td>K1059803</td>
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<td>2.30</td>
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<td>2,100</td>
<td>15,000</td>
<td>13,000</td>
<td>1,400</td>
<td>13.0</td>
<td>460</td>
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Clark Fork Superfund Background Levels (mg/Kg) = ppm

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<th></th>
<th>As</th>
<th>Cd</th>
<th>Pb</th>
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</thead>
<tbody>
<tr>
<td>U.S. Mean Soil</td>
<td>6.7</td>
<td>0.7</td>
<td>20.0</td>
</tr>
<tr>
<td>Helena Valley Mean Soil</td>
<td>16.5</td>
<td>0.2</td>
<td>11.5</td>
</tr>
<tr>
<td>Missoula Lake Bed Sediments</td>
<td>NA</td>
<td>0.2</td>
<td>34.0</td>
</tr>
<tr>
<td>Blackfoot River</td>
<td>4.0</td>
<td>&lt;0.1</td>
<td>NA</td>
</tr>
<tr>
<td>Phytotoxic Concentration</td>
<td>100.0</td>
<td>100.0</td>
<td>1000.0</td>
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Explanation
Below Detection Limit is ---
Not analyzed equals NA
Table 2.5-4. Toxicity Characteristic Leaching Procedure for dump samples from the minor properties in the Coeur d'Alene River basin surrounding the Coeur d'Alene mining district. Properties shown in gray are discussed in Sections B, C, and D of this volume.

<table>
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<th>Cd (ppm)</th>
<th>Cr (ppm)</th>
<th>Pb (ppm)</th>
<th>Hg (ppm)</th>
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<th>Ag (ppm)</th>
<th>Ba (ppm)</th>
<th>pH</th>
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<td>Royal Mine (SP-125), dump</td>
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<td>—</td>
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<td>—</td>
<td>0.073</td>
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<tr>
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<td>0.900</td>
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<tr>
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<td>Central Prospect (WL-445), Adit #1 dump</td>
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<td>—</td>
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<td>—</td>
<td>—</td>
<td>5.100</td>
<td>8.1</td>
</tr>
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<td>B8069705</td>
<td>Gravel pit, Willow Creek</td>
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<td>0.140</td>
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<td>—</td>
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<td>0.850</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<td>—</td>
<td>—</td>
<td>ND</td>
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<td>—</td>
<td>1.300</td>
<td>6.1</td>
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<tr>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>ND</td>
<td>—</td>
<td>—</td>
<td>1.300</td>
<td>6.6</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<td>—</td>
<td>1.200</td>
<td>7.8</td>
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<td>—</td>
<td>—</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1.000</td>
<td>8.1</td>
</tr>
<tr>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.830</td>
<td>4.6</td>
</tr>
<tr>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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**EXPLANATION**

Blank space equals no analysis

Not Detected is ND

Below Detection Limit is —

**WATER QUALITY STANDARDS**

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Table 2.5-4 (continued). Toxicity Characteristic Leaching Procedure for dump samples from the minor properties in the Coeur d'Alene River basin surrounding the Coeur d'Alene mining district.

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<th>Pb (ppm)</th>
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<td>North Fork Mine (SP-77), Adit #2, dump</td>
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EXPLANATION

Blank space equals no analysis
Not Detected is ND
Below Detection Limit is ---

WATER QUALITY STANDARDS

<table>
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<th>As (mg/L)</th>
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<td>Estimated Detection Level (33% confidence)</td>
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<td>0.0017</td>
<td>0.65</td>
<td>0.27</td>
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</table>
3.0 MINE DESCRIPTIONS – COEUR D'ALENE BASIN, SECONDARY PROPERTIES

3.1 WASHINGTON-IDAHO MINE (Site No. SP-117)
   Alternative names—Cavanaugh Group, Crescent Group, Hetzel Group, Annie Laurie.

3.1.1 Site Location and Access (Figure 2.1-1a)

The Washington-Idaho Mine is on the West Fork of Moon Creek at the end of the paved road. It is in the SW¼ of the NE¼ of section 26, T. 49 N., R. 3 E., on the Kellogg East 7.5-minute quadrangle (Figure 3.1-1). The mine is depicted on the topographic map with adit and shaft symbols. Beyond the mine, the road has been reclaimed by the Forest Service. The property is on Forest Service land.

3.1.2 Geologic Features (Figure 2.2-1a)

The mine is in dark gray to black, very fine grained quartzites of the Prichard Formation. There are three fairly continuous quartz veins up to 1½ feet wide, plus two short segments of a fourth vein, on the property. Principal ore minerals are sphalerite and galena (Erickson and Quinlan, 1956).

3.1.3 Site History

The first claims at the mine were located in 1889 (Erickson and Quinlan, 1956). The Crescent Mining & Milling Co. acquired the property in 1912 and by 1923, the mine had six tunnels and a total of 1,600-1,800 feet of workings. In 1923 and 1924, both the Annie Laurie Mining, Milling & Smelting Co. and the Lewis-Clark Mining & Smelting Co. did work on the property (IGS mineral property files). The Washington-Idaho Mining Co. was incorporated in October 1927 to take over the property (Erickson and Quinlan, 1956). By late 1931, the mine had about 3,000 feet of workings, including a 340-foot vertical shaft and four tunnels (IGS mineral property files).

The property was inactive from 1933 to 1948. In 1948, a compressor and other equipment were installed on the property and a small amount of development work was started. By 1950, the mine had a total of 5,500 feet of workings, including five tunnels, three intermediate levels, and a 340-foot vertical shaft (IGS mineral property files). In August 1950, the Idaho Mining Company took over the mine. The headframe burned in the spring of 1951, but the surface plant and headframe were rebuilt under a DMEA contract and exploration resumed. Work under the DMEA contract included rehabilitating the shaft and conducting exploration on the 300 level of the mine. The contract was terminated in 1954 without discovering any significant amounts of ore (Erickson and Quinlan, 1956). The mine is believed to have been idle since that time.
3.1.4 Environmental Conditions

3.1.4.1 Site Features

This property was visited by Earl Bennett on July 23, 1997. A video segment describing the property is on the Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 00:01:53-00:15:29). Documenting photos are Roll B3, frames #1-9.

The Washington-Idaho Mine consists of a shaft and waste dump on the east side of the West Fork of Moon Creek, and several adits and dumps on the west side of the creek (Figure 3.1-2). Several structures are associated with the shaft.

An old ore bin is on the main dump on the east side of the access road. Nearby is a caved shaft which has a concrete collar. Timbers from the headframe have collapsed into the shaft (Figure 3.1-3). The cage from the shaft is lying on the dump, and an air hose and another pipe go down the shaft. The pad for the hoist is just north of the shaft collar. North of the hoist pad is another collapsed building and behind that is a tower with a water tank. The tank was filled from a small tributary just a few feet from the tower, and water can be heard gurgling in a pipe in the tower. The dump, easily visible from the road (Figures 3.1-4 and 3.1-5), measures about 173 feet long, 38 feet wide, and 30 feet thick on the nose; the actual thickness is about 10-15 feet. It has no discoloration and does not impinge on the creek. The hillside east of the dump is held back by log cribbing (Figure 3.1-6). There is a considerable amount of scrap iron on the dump and garbage at the end of the road. This entire area is densely covered with brush.

The dumps for several adits are located on the west side of the creek. One adit (Adit #2) is open (Figure 3.1-7) and very accessible to the public. A small dump, about 20 feet long, is heavily overgrown. There is a prospect pit just south of this adit and several pits to the north. About 40 feet south of Adit #2 is another heavily overgrown dump (75 feet long and 30 feet wide) and a barely open adit (Adit #1; Figure 3.1-8). A tree has fallen diagonally across the adit, and below the tree, debris has sloughed in front of the opening. About 20 feet north of this adit is another prospect pit, part of an old building, and a separate concrete block foundation. The south dump does not seem to be eroded by the stream.

Total disturbed area at the site is about 1 acre.

3.1.4.2 Sample Locations

3.1.4.2.1 Solid Samples

A waste dump sample (B7239701) was collected from the main dump on the west side of the creek (the south, or #1, adit).
<table>
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<th>Location</th>
<th>Analyzed (Yes/No)</th>
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<td>Washington-Idaho, Adit #1 (south adit) dump</td>
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### 3.1.4.2.2 Water Samples
No water samples were collected at this site.

### 3.1.4.2.3 Analytical Results

**Solid Samples (Tables 2.5-3 and 2.5-4)**

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-2), the element screen for sample B7239701 has elevated levels of arsenic (410 ppm), cadmium (13 ppm), copper (87 ppm), iron (4.4 percent), lead (1200 ppm), and zinc (1,100 ppm). In the TCLP for metals screen, cadmium and lead showed significant leaching.

### 3.1.5 Structures

Structures at the main working include the concrete shaft collar, an old ore bin, a water tank tower, a hoist pad, and a collapsed building behind the water tower. A collapsed building and a separate concrete block foundation are just north of Adit 1.

### 3.1.6 Safety

Adit #2 is readily accessible. Adit #1, although nearly caved, could be opened enough to provide access. Both of these are potentially hazardous because of collapse or caving. However, the most serious hazard is the shaft. Although somewhat sloughed-in and closed off by the collapsed headframe timbers, the shaft still may be partially open.
Figure 3.1-1. Topographic map of the Washington-Idaho Mine, Shoshone County, Idaho (U.S. Geological Survey Kellogg East 7.5-minute topographic map).
Figure 3.1-2. Sketch of the Washington-Idaho Mine site.
Figure 3.1-3. Concrete collar of the shaft. The headframe timbers and rock debris have collapsed into the opening (Roll B3, frame #1).

Figure 3.1-4. Waste dump beside the access road at the Washington-Idaho Mine (Roll B3, frame #9).
Figure 3.1-5. Looking across the surface of the Washington-Idaho dump (Roll B3, frame #3).

Figure 3.1-6. Log cribbing against the hillside on the east side of the waste dump (Roll B3, frame #4).
Figure 3.1-7. Open Adit #2 at the Washington-Idaho Mine. Some of the portal timbers are visible through the brush (Roll B3, frame #6).

Figure 3.1-8. Partially open Adit #1 at the Washington-Idaho Mine. Rock debris has sloughed in front of the adit, leaving an opening about 4 feet wide by 2 feet high (Roll B3, frame #7).
3.2 COMMONWEALTH MINE (Site No. SP-45)
Alternative names—Nighthawk, Hayden Creek Mines.

3.2.1 Site Location and Access (Figure 2.1-1a)

The Commonwealth Mine is on both sides of Hayden Creek along Forest Service Road 206, about ¼ mile west of its junction with Forest Service Road 437 in the NE¼ of the SE¼ of section 26, T. 52 N., R. 3 W., on the Hayden Lake 7.5-minute quadrangle (Figure 3.2-1).

3.2.2 Geologic Features (Figure 2.2-1a)

The mine is in rocks of the Wallace Formation (Anderson, 1940). Anderson (1940, p. 62-63) described the geology of the deposit in detail:

The Commonwealth is on one of the largest and most conspicuous quartz veins in the district. This vein strikes about N. 25° E., dips 75° S.E., and may be traced on both sides of Hayden Creek for at least 2,000 feet by its reddish and brownish iron-stained cropping, which in places projects as much as 50 feet above the surface. A short distance north of the shaft it forms a bold bluff 100 feet high. At the surface the vein appears to be mostly 10 to 20 feet thick, but the underground map indicates it may be considerably thicker.

This vein is composed largely of white granular quartz, heavily iron-stained on the surface, but showing some thin patches of malachite and azurite. It also contains variable but scant amounts of barite. The unoxidized vein matter has more or less widely disseminated minute grains and granules of sulphides, a few of which are individually recognizable to the unaided eye. In the few pieces of ore remaining on the dump are small quantities of pale brownish grains of sphalerite, some tetrahedrite, and a little pyrite, galena, and chalcopyrite. Much of the vein appears as a cemented quartz breccia. . . . According to mine records, several ore shoots were exposed in the underground workings which varied in the quantity of different metals present. Assay records show that much of the ore carried from 0.02 to 0.04 pounds of gold per ton and from 4 to 50 ounces of silver. The amount of copper rarely exceeded 1 per cent and the lead 4 per cent. Sphalerite is apparently the most abundant mineral for some of the assays reveal as much as 32 per cent zinc, although generally the percentage is less than 5 per cent. It appears to the ore is more or less bunchy and confined to individually small shoots.

3.2.3 Site History

The initial claims at the Commonwealth were located before 1900. The Hayden Creek Mining & Milling Co. was organized in 1904 and operated the property until late 1916. At that time, the development included a 300-foot shaft and 700 feet of drifts. The Commonwealth Mining Co. took over the property in November 1916. This company did considerable development work and made substantial additions to the mine plant over the next few years, but defaulted on interest
payments on its bonds. As a result, the bondholders purchased the property at a court-ordered sale in February 1923. Commonwealth Metals Co. was organized the following year to operate the mine, but did only minimal work for the next fifteen years. In 1937, Commonwealth changed its name to Sunshine Metals Corporation. The following year, the company reported about 2,520 feet of workings, including 2 tunnels and 2 shafts. In the late 1930s, Anderson (1940, p. 62) said about the mine:

It is owned by the Commonwealth Metals Company, incorporated March 19, 1924, and comprises the Commonwealth group of 7 unpatented claims on which are a vertical shaft 325 feet deep, two inclined shafts 150 and 225 feet deep, and two tunnels, No. 1, 470 feet long, and No. 2, 80 feet long. No work other than annual labor has been done for many years and none of the old workings could be entered in 1937. Some ore was shipped prior to 1916, but the amount shipped and its value was not learned. The entire surface plant has been dismantled.

The mine remained idle for the next decade. Nighthawk Silver-Lead Mining Co., Inc., acquired the Commonwealth Mine in 1948. When U.S. Bureau of Mines personnel conducted a war minerals examination of the mine in 1950, most of the workings, including both shafts, were caved. Nighthawk built a number of roads and rehabilitated some of the old workings as part of its annual assessment work.

Nighthawk merged with Sunshine Metals in 1961, and the company's name was changed to Commonwealth Silver, Inc. In 1962, Commonwealth Silver signed an agreement with Federal Resources Corporation for Federal to explore the property. Most of this work consisted of diamond drilling in connection with a $46,640 Office of Minerals Exploration contract. Five holes were drilled under this program before it was terminated due to the absence of any significant mineralization.

### 3.2.4 Environmental Conditions

#### 3.2.4.1 Site Features

The Commonwealth property was visited by John Kauffman on July 17, 1997; a follow-up visit was conducted on October 5, 1998 to locate two reported shafts that were not found during the initial visit. A video segment describing the site is on the Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 00:15:32-00:21:52). Documenting photos are 1997 series photos Roll K1, frames 11-12; and 1998 series photos, Roll K19, frames 24-26, and Roll K20, frames 1-4.

Only the remains of the two tunnels reported by Anderson were found during the initial site inspection. Two shafts, shown on a 1961 map in a Department of Interior Office of Minerals Exploration report (Figure 3.2-2), were found during the follow-up visit in 1998.

Adit #1 of this report is presumed to be the remains of Anderson's tunnel No. 1. This adit is caved and is visible as a sloughed area on the slope on the north side of FS Road 206. The road,
in fact, crosses an overpass built about where the portal would have been and, when viewed from the dump surface below the road, appears to be a portal (Figure 3.2-3). The waste dump is overgrown with trees and brush, but is partially visible from the road. It is about 75 feet long, 35 feet wide, and 15 feet thick. It does not directly impinge on the creek, although at high water or flood stage, it might be vulnerable to erosion.

What was considered a questionable Adit #2 or cut at the time of the visit is most likely the short tunnel No. 2 of Anderson’s report. It is located about 100 feet uphill from and north of Adit 1 at the end of an extensively overgrown road just below a large cliff outcrop. The dump is about 75 feet long, 25 feet wide, and 6 feet or less thick.

The North Shaft (Figure 3.2-4) is about 200 feet northeast of Adit #1 and about 50 feet above the FS Road 206. Although the waste dump actually extends down to the road, it is not obvious because of the brushy slope. A jeep trail and an old, brushed-over access road lead to the shaft from FS Road 206. The shaft is caved but still is about 15-18 feet deep. The south wall of the shaft is near vertical, but the north wall has sloughed and the slope is about 45°. It is located in thick brush and saplings near the north end of the weed-covered dump surface (Figure 3.2-5). Metal posts and barbed wire fencing surround the shaft opening, although the fencing has been knocked down in several places by fallen trees. The dump is about 105 feet long, 30 feet wide, and probably 40 feet thick down the face, although the face is cut by an old dozer road.

The South Shaft (Figure 3.2-6) is located about 1,200 feet southwest of the North Shaft along the crest of a ridge on the east side of FS Road 206, southwest of the junction of FS Roads 206 and 437. A short access road off FS Road 206 leads up the south flank of the ridge to the shaft. This shaft is also caved and about 10-12 feet deep. The sides are mostly sloughed with slopes of about 45°. The waste dump (Figure 3.2-7), about 40 feet long, 30 feet wide and 10-20 feet thick, extends across the ridge crest and down the north slope. As at the North Shaft, barbed wire fencing with metal corner posts surrounds the shaft opening. Several metal posts along the sides are anchored in concrete pads.

### 3.2.4.2 Sample Locations

#### 3.2.4.2.1 Solid Samples

Because of the relatively close proximity of the Adit #1 dump to Hayden Creek, a sample was collected from the southwest portion of the dump (K07179701).

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<th>Location</th>
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<td>Commonwealth waste dump</td>
<td>Yes</td>
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</table>
3.2.4.2.2 Water Samples
No water samples were collected at this site.

3.2.4.2.3 Analytical Results

Solid Samples (Table 2.5-3 and 2.5-4)

Compared to expected background values (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-5), sample K07179701 has elevated values of arsenic (210 ppm), cadmium (3.7 ppm), copper (840 ppm), lead (8,600 ppm), and zinc (300 ppm) in the element screen. In the TCLP for metals screen, cadmium and lead showed significant leaching.

3.2.5 Structures
No structures were found at the site.

3.2.6 Safety

There are no safety problems with the adits found at the site. The North Shaft has a vertical south wall, but the north wall has sloughed and provides an exit route from the pit. Fencing around both shaft openings, even though breached by fallen trees at the North Shaft, provides an additional measure of safety.
Figure 3.2-1. Topographic map of the Commonwealth Mine, Kootenai County, Idaho (U.S. Geological Survey Hayden Lake 7.5-minute topographic map).
Figure 3.2-2. Plan of the Commonwealth Mine, showing claim boundaries and location of workings (Idaho Geological Survey mineral property files).
Figure 3.2-3. Looking north toward caved Adit #1 at the Commonwealth property. The adit was driven northward into the hill at the base of the cut in the background. The timbers, which appear to be a portal, are actually supports for Forest Service Road 437 (Roll K1, frame #11).
Figure 3.2-4. Looking down into the North Shaft at the Commonwealth Mine (Roll K19, frame #24).
Figure 3.2-5. Surface of the North Shaft waste dump at the Commonwealth Mine, looking south (Roll K19, frame #25).
Figure 3.2-6. View into the caved South Shaft pit at the Commonwealth Mine, looking north (Roll K20, frame #1).
Figure 3.2-7. Looking north at the access road crossing the top of the waste dump at the Commonwealth Mine (Roll K20, frame #3).
3.3 SHAMROCK MINE (Site No. SP-42)

3.3.1 Site Location and Access (Figure 2.1-1a)

The Shamrock Mine is on the North Fork of Hayden Creek approximately one mile north of the junction of the North Fork and East Fork of Hayden Creek. It is just east of the center of the NW¼ of section 24, T. 52 N., R. 3 W., on the Hayden Lake 7.5-minute quadrangle (Figure 3.3-1). The adit is on the west side of the creek and is reached by a short road from Forest Service Road 625 (Figure 3.3-2). This road terminates in an open pasture area on the east side of the creek, although it presumably originally crossed the creek to the mine.

3.3.2 Geologic Features (Figure 2.2-1a)

Anderson (1940, p. 56-57) reports:

The Shamrock is on a zone of intense deformation along which the gray and black beds of the Wallace formation have been extremely sheared and altered. The zone of shearing trends N. 15° to 20° E., dips 85° N.W., and crosses the strike and dip of the Wallace strata at nearly right angles. The zone is not less than 60 feet wide and has been explored for a length of about 150 feet. It has a prominent hanging wall bounded by a conspicuous fracture plane beneath which the rock is intensely mashed and sheared for a width of 3 to 6 feet. The remainder of the zone is intricately, though not as intensively, fractured, and shades into an ill-defined, little-fractured footwall. Some of the fractures of this zone have seams of gouge an inch or two thick.

The rock throughout the zone has been more or less extensively altered. That through the intensely mashed zone along the hanging wall has a dark greenish color and has been extensively chloritized, whereas the remainder has been more or less completely sericitized and changed in part to a pale greenish sericite schist containing a little disseminated pyrite. In places the sericitized rock has associated greenish blotches of chloritized rock, also partly sericitized.

Through the altered rock are widely scattered small bunches and nests of pyrite and galena, also thin seams of quartz, some of which contain tetrahedrite and small masses of ferriferous dolomite or ankerite. In places the altered rock is heavily impregnated with pyrite for an inch or two and has minor amounts of galena as bunches rarely more than a few inches thick or a foot long.

3.3.3 Site History

According to Anderson (1940, p. 56):

The Shamrock . . . is owned by the Shamrock Silver Mining Company, incorporated as the Shamrock Mining and Milling Company, February 17, 1932, but changed to the present name July 17, 1935. The property comprises the Shamrock group of 5 unpatented claims on which the development approximates

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1,400 feet of crosscuts and drifts on one level (fig. 7 [Figure 3.3-3]). The property was active during 1930 and 1931, in 1933, and again in 1936 and 1937. During 1936, 200 feet of development work was done and all workings were retimbered. In 1937, a station was cut and work was started on a shaft from a drift on the tunnel level. During late 1937 and early 1938, work was started on a mill.

Only a little work was done in 1939. At that time, the mine had two tunnels, two shafts, and a total of 1,600 feet of development. The company forfeited its corporate charter in 1940.

3.3.4 Environmental Conditions

3.3.4.1 Site Features

The Shamrock property was visited by John Kauffman on July 17, 1997. A video segment describing the property is on the Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 00:22:00-00:26:28). Documenting photos are Roll K1, frames 13-17.

The Shamrock adit was driven westward into the hillside about 20 feet above creek level. The framed portal (Figure 3.3-4) is boarded over about 12-15 feet inside, but the adit is open and accessible from above and behind the framed part of the portal. A minor seep of less than 1 gallon per minute trickles from the portal and pools on the southwest corner of the waste dump, where it disappears into the dump. The waste dump is covered with grass and weeds (Figure 3.3-5). It is about 100 feet long, 40 feet wide, and 10-15 feet thick, with the long dimension parallel to the creek. One side meander of the creek follows the toe of the dump. Most of the material on the dump is either gray or reddish-brown waste rock. None of the material was strongly oxidized, and very little mineralization was seen in any of the waste rock. The original site, which would have included the pasture where the millsite is presumed to have been, probably occupied 2-4 acres. The present disturbed area, essentially just the adit and waste dump, covers less than 0.5 acre.

A placer claim notice dated 5/96 was found inside the portal. The short access road exiting FS Road 625 to the property had an unlocked gate across it, along with a partially destroyed “KEEP OUT” sign.

3.3.4.2 Sample Locations

3.3.4.2.1 Solid Samples

One waste dump sample (K07179703) was collected from three portions of the face of the dump.

<table>
<thead>
<tr>
<th>Sample No</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K07179703</td>
<td>Shamrock waste dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.3.4.2.2 Water Samples

A water sample (K07179702) was collected from the seep from the portal.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (μS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K07179702</td>
<td>Shamrock adit</td>
<td>109</td>
<td>48</td>
<td>7.8</td>
<td>0.2</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.3.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-5), sample K07179703 has slightly elevated values of arsenic (130 ppm), cadmium (3.0 ppm), chromium (45 ppm), and copper (37 ppm) in the element screen. In the TCLP for metals screen, only lead shows significant leaching.

Water Samples (Tables 2.5-1 and 2.5-2)

Sample K07179702 exceeds all standards for cadmium and is at the lower limit of the Aquatic Life Chronic standard for lead in the total recoverable metals screen. In the dissolved metals screen, the sample exceeds the Aquatic Life Chronic value for cadmium.

3.3.5 Structures

Although two structures are depicted on the topographic map on the east side of the creek, none were found. Presumably these were buildings associated with the mine, which included a blacksmith shop, a compressor house, bunkhouses, and a cook house. The pilot mill mentioned by Anderson would also have been in this area, but it may not have been completed. The area is now a fairly open pasture which is used by campers.

3.3.6 Safety

The only potential safety hazard would be the potential for caving conditions if someone entered the adit through the opening behind the portal timbers.
Figure 3.3-1. Topographic map of the Shamrock Mine, Kootenai County, Idaho (U.S. Geological Survey Hayden Lake 7.5-minute topographic map).
Figure 3.3-2. Sketch of the Shamrock Mine site.
Figure 3.3-3. Geologic sketch map of the underground workings of the Shamrock Mine (Anderson, 1940, Figure 7). The bedrock is Wallace Formation, and the strike and dip of the bedding is indicated by the symbols.
Figure 3.3-4. Open portal of the Shamrock Mine adit, looking west (Roll K1, frame #13).

Figure 3.3-5. Looking east across the Shamrock waste dump. The white line across the foreground is a measuring tape (Roll K1, frame #15).
3.4 BRADBURY PROSPECT (Site No. SP-35)

3.4.1 Site Location and Access (Figure 2.1-1a)

The Bradbury Prospect is near the head of the North Fork of Hayden Creek in the SE¼ of the SW¼ of section 9, T. 52 N., R. 2 W., on the Spades Mountain 7.5-minute quadrangle (Figure 3.4-1). The property is accessible via jeep trail that exits east off Forest Service Road 625 and follows the North Fork of Hayden Creek about 1 mile to the site of the workings (Figure 3.4-2).

3.4.2 Geologic Features (Figure 2.2-1a)

Anderson (1940, p. 64) noted:

The country rock consists of somewhat disturbed but not much altered quartzitic beds of the Wallace formation which locally strike northeast and dip northwest at a moderate angle. The vein, or veins, appears in general to conform rather closely with the strike of the strata; but the angle of dip is much greater than the dip of the strata and in places is in the opposite direction. The veins are extremely irregular as to thickness and pinch and swell abruptly (fig. 16 [Figure 3.4-3]). In places they are about a foot thick; in other places, 30 feet. They are also bordered by a fringe of quartz seams and stringers which extend outward at diverse angles, but for no great distance. The bodies have been cut by some faults of N. 10° W. strike, but displacement along them does not appear to exceed a few feet.

The veins are composed mostly of medium to fairly coarse-grained white quartz, in places somewhat shattered and containing scattered small crystals and granular pods of pyrite and lesser amounts of arsenopyrite and chalcopyrite. Galena is reported. Some scattered thin seams of ankerite and siderite cut and replace the quartz and its sulphides. The quartz is partly a filling but mostly a replacement of the country rock, and commonly contains chloritized fragments and shadow-like inclusions of the wall. Some of the chalcopyrite granules have thin crusts of greenish malachite.

3.4.3 Site History

According to Anderson (1940, p. 64):

The property is owned by the Hayden Lake Mining and Milling Company, incorporated May 8, 1917, and consists of 12 unpatented claims on which are two tunnels, one with about 1,600 feet of workings, the other with about 800 feet. Little active work has been carried on since 1923, and in 1937 only the lower No. 1 tunnel was open.

In 1925 the mine had one tunnel and about 800 feet of total workings. In 1936 the mine had two tunnels and 2,000 feet of workings; most of this was probably as a result of annual assessment work. The mine was operated by a lessee from 1938 until at least 1941. Little work seems to have been done after that, and the company forfeited its corporate charter in 1949.
3.4.4 Environmental Conditions

3.4.4.1 Site Features

The Bradbury Prospect was visited by John Kauffman on July 17, 1997. A video segment describing the site is on the Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 00:26:31-00:31:39). Documenting photos are Roll K1, frames 20-22.

Only the lower of the two adits mentioned by Anderson was found during the site visit. This tunnel, driven northward into the hillside, is caved, and there is a large slump on the hillside above the portal area (Figure 3.4-4). The waste dump measures about 155 feet long, 100 feet wide, and 15 feet thick. It is bisected by the creek. The waste rock is mostly coarse and fairly uniform in appearance. The remains of an old wooden flume can be seen in the creek bottom (Figure 3.4-5). This flume apparently channeled the creek beneath the waste dump. Various types of debris, such as old ore car rails, sheet metal, and rusted 55-gallon drums, are scattered around the site. The surface of the waste dump is also being used for camping. The campers have left a minor amount of garbage, such as pop and beer cans, plastic bags, and other trash, on or around the site. The other adit, presumably uphill from the lower adit, was not accessible in 1940 and no attempt was made to locate it during this visit. The hillside is extremely brushy with no obvious indications of any past or recent activity above the lower adit.

The disturbed area covers about 0.75 acre.

3.4.4.2 Sample Locations

3.4.4.2.1 Solid Samples

One channel sample (K07179705) of the waste dump was collected down the north embankment where the creek has dissected the dump.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K07179705</td>
<td>Bradbury waste dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.4.4.2.2 Water Samples

No water samples were collected at this site.

3.4.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-5), sample K07179705 has elevated values of arsenic (160 ppm), cadmium (4.0 ppm), copper
(130 ppm), lead (170 ppm), and zinc (390 ppm) in the element screen. All values are below detection limits in the TCLP for metals screen.

3.4.5 Structures

A log cabin measuring about 12 feet by 16 feet is on the south side of the creek directly across from the waste dump. It is somewhat hidden in the trees but can be seen from the east end of the dump. Although the structure is mostly intact, it is in disrepair. A foot trail extends from the east end of the dump to the cabin. A wooden foot bridge that crossed the creek has been disrupted by flooding during the past two years.

3.4.6 Safety

No safety problems were identified at this site.
Figure 3.4-1. Topographic map of the Bradbury Mine, Kootenai County, Idaho (U.S. Geological Survey Spades Mountain 7.5-minute topographic map).
Figure 3.4-2. Sketch of the Bradbury Mine site.
Figure 3.4-3. Geologic sketch map of the lower tunnel of the Bradbury Mine (Anderson, 1940, Figure 16). The bedrock is Wallace Formation, and the strike and dip of the bedding is indicated by the symbols.
Figure 3.4-4. Looking north toward the caved adit. One upright timber from the portal is in the center of the photo. A piece of black plastic water pipe crosses the lower part of the photograph (Roll K1, frame #20).
Figure 3.4.5. View of the notch where the North Fork of Hayden Creek has eroded through the waste dump. The wooden beams in the bottom appear to be the remains of a flume. A section of rail lies on the dump in the lower right portion of the photograph (Roll K1, frame #22).
3.5 BURNT CABIN MINE (Site No. SP-53)

Alternative name—Inland Premier Mine.

3.5.1 Site Location and Access (Figure 2.1-1a)

The Burnt Cabin Mine is on the east slope of a deep north-south trending ravine near the head of Burnt Cabin Creek in the NW¼ of the NE¼ of section 15, T. 51 N., R. 2 W., on the Spades Mountain 7.5-minute quadrangle (Figure 3.5-1). The workings are about ½ mile east of Burnt Cabin Summit and are accurately located on the topographic map. A foot trail descends from Forest Service Road 206 southward about 100-200 yards to the site. The Burnt Cabin Prospect is on Forest Service land.

3.5.2 Geologic Features (Figure 2.2-1a)

According to Anderson (1940, p. 57):

The Burnt Cabin occupies a prominent fissure zone as much as 20 feet wide which cuts obliquely across the upper beds of the St. Regis formation. The strata are somewhat disturbed on either side of the fracture zone, but their general strike is northwest and dip northeast. The fracture zone itself strikes about N. 40° to 50° W. and dips 60° S.W. The mineralized body is from 3 to 6 feet thick, but there are also scattered seams and stringers extending throughout the fracture zone. Post-mineral movement has produced considerable gouge along parts of the deposit, especially along the No. 2 level, but in the drift from the shaft bottom, 100 feet below, the body is frozen to the walls. Other post-mineral faults are also present, some of which parallel the fissure, whereas others strike N. 10° W. and dip steeply east.

The deposit consists mostly of ankerite, quartz, specularite, and pyrite, but contains a little siderite and chalcopyrite. . . . The wall rock has been somewhat bleached because of slight sericitization and silicification.

3.5.3 Site History

Company reports in IGS’s mineral property files state that the Burnt Cabin was originally the property of Inland Premier Mines (later Idaho Premier Lead Mines). According to Idaho Premier Vice President George O. Ayers, the company’s claims were jumped by “certain parties who afterwards conveyed these properties to the Burnt Cabin Mining Company.” Burnt Cabin won the lawsuit over who owned the property.

Anderson (1940, p. 57) notes the following information about the Burnt Cabin:

It is owned by the Burnt Cabin Mining Company, incorporated April 28, 1926, and consists of 15 unpatented claims on which are three tunnels (two of them caved) and a shaft. The accessible workings, the No. 2 level and the 100-foot shaft and its crosscuts and drifts, are shown in Figure 8 [Figure 3.5-2]. This company has

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performed some work annually since its incorporation and the shaft and its lower level have been driven since 1928. The lower drift was being extended in 1937.

After Anderson's visit, the only activity at the mine seems to have been assessment work done by the stockholders. The company forfeited its corporate charter in 1962.

3.5.4 Environmental Conditions

3.5.4.1 Site Features

The Burnt Cabin Mine was visited by John Kauffman on July 24, 1997. A video segment describing the site is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 33:31:40-00:38:30). Documenting photos are Roll K2, frame 19-24.

Although Anderson (1940) mentioned three tunnels, only two were found, and one of those may have been driven after Anderson's visit. Adit #1 of this report appears to be Anderson's No. 2 tunnel based on its location and the size of the dump. Adit #2, which is open, does not fit Anderson's description of the other tunnels, which were caved in 1937. The shaft was also found during this site visit (Figure 3.5-3). Because the slopes surrounding the main workings are heavily timbered and have considerable underbrush in places, it is entirely possible that the other adits and waste dumps still remain. However, if they were caved when Anderson visited the property, they are most likely still caved and of little significance.

Adit #1, the northernmost tunnel found, is mostly caved at the portal, but has a small opening which could be enlarged to provide access (Figure 3.5-4). It could not be determined if the adit was open beyond this opening. Remaining portal timbers are rotted and collapsed. The fan-shaped waste dump for Adit #1 is about 50 feet long, 50 feet wide, and a maximum of 25 feet in thickness. It is sparsely to moderately vegetated and reasonably stable. A tarp-and-fir bough shelter, roughly 8 feet by 8 feet square, has been constructed on the dump surface (Figure 3.5-5). Some trash at the campsite was evidence of recent use.

The shaft is about 50 feet south of Adit #1 and appears to be caved, although the vegetation is extremely thick over the area of the shaft opening. Several rocks pitched into the brush did not continue down an opening. However, it is possible that the shaft is merely bridged by debris at the surface and could be open below. The waste dump for the shaft has two lobes, although it was probably originally one dump that has been partially dissected by erosion. Lobe #1 (Figure 3.5-6) extends west from the shaft and is about 30 feet long, 5 feet wide on top, and 40 feet down the face (Figure 3.5-7). Lobe #2 (Figure 3.5-8) extends southward from the shaft parallel to the hillside and is about 30 feet long, 5 feet wide on top, and 15 feet thick. There is some patchy vegetation on these lobes, but they are mostly bare. Lobe #1 contains mostly unoxidized rock while Lobe #2 has a considerable amount of oxidized material.

Adit #2, approximately 100 feet south of the shaft, is well hidden in timber and brush, although a visible foot trail leads to it. Some material has sloughed in at the portal, but a sizable opening
remains behind this material (Figure 3.5-9). The opening was covered with chicken wire at one time, but it has been pulled down. The waste dump for Adit #2 is stable and very brushy, with some small trees several inches in diameter. It is about 25 feet long, 10 feet wide, and 20 feet down the face. Its length parallels the slope and, because of the steepness of the slope, the actual thickness is probably a maximum of 10 feet.

There is a fair amount of scrap metal at this site, including old metal drums, a garbage can, bed springs, sheet metal, and other items. The disturbed area covers about 0.5 acre.

3.5.4.2 Sample Locations

3.5.4.2.1 Solid Samples

Two waste dump samples were collected at this site. An unoxidized dump sample (K07249702) was taken from Lobe #1 and an oxidized dump sample (K07249703) from Lobe #2 of the shaft dump.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K07249702</td>
<td>Burnt Cabin, unoxidized dump</td>
<td>Yes</td>
</tr>
<tr>
<td>K07249703</td>
<td>Burnt Cabin, oxidized dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.5.4.2.2 Water Samples

The shaft waste dump somewhat impinged on the drainage and had a seep of about 3 gallons per minute flowing from its toe. A water sample (K07249701) was taken from the seep at the toe of Lobe #1 of the shaft dump.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (μS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K07249701</td>
<td>seep from dump</td>
<td>58</td>
<td>43</td>
<td>7.8</td>
<td>&lt;1</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.5.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-5), sample K07249702 (unoxidized material) has elevated cadmium (3.4 ppm) and copper (48 ppm), and slightly elevated iron (4.9 percent) and lead (58 ppm) in the element screen. Sample
K07249703 (oxidized material) has elevated values of arsenic (130 ppm), cadmium (5.7 ppm), copper (39 ppm), iron (9.7 percent), and lead (340 ppm), and slightly elevated zinc values (150 ppm) in the element screen. In the TCLP for metals screen, values for both samples are below detection limits for all metals of concern.

Water Samples (Tables 2.5-1 and 2.5-2)

In the total recoverable metals screen, sample K07247901 exceeds the Aquatic Life Chronic standard for cadmium and the Secondary MCL for manganese, and is at the lower limit of the Aquatic Life Acute standard for cadmium. The sample is below all standards in the dissolved metals screen.

3.5.5 Structures

No structures remain at the site. The remains of a rock foundation, possibly for an old cabin, are at the base of the access trail just west of Adit #1.

3.5.6 Safety

Adit #1 could probably be entered with some effort, but as it is now, it should not be a hazard. Adit #2 could easily be entered and, depending on rock and air conditions, is potentially a hazard. Although the shaft appeared to be collapsed, it could be a significant hazard if it is only bridged at the surface and is open below.
Figure 3.5-1. Topographic map of the Burnt Cabin Mine, Kootenai County, Idaho (U.S. Geological Survey Spades Mountain 7.5-minute topographic map).
Figure 3.5-2. Sketch map of the underground workings of the Burnt Cabin Mine (Anderson, 1940, Figure 8). The bedrock is St. Regis Formation, and the strike and dip of the bedding are indicated by symbols.
Figure 3.5-4. Looking northeast into the opening at Adit #1 of the Burnt Cabin Mine. The boards in the left foreground may have been used at one time to cover the entrance (Roll K2, frame #19).
Figure 3.5-5. Looking south or southwest across the surface of the Adit #1 waste dump, showing the campsite and the recently occupied fir bough-and-tarp shelter (Roll K2, frame #20).

Figure 3.5-6. Looking southeast at the main lobe of the waste dump from the shaft of the Burnt Cabin Mine (Roll K2, frame #21).
Figure 3.5-7. Looking southeast at the small lobe of the waste dump from the shaft of the Burnt Cabin Mine. The oxidized dump sample (K07249703) was collected from the darker area in the center of the photograph (Roll K2, frame #22).

Figure 3.5-8. View down the face of the waste dump from the shaft at the Burnt Cabin Mine. The unoxidized dump sample (K07249702) was collected down this surface (Roll K2, frame #23).
Figure 3.5-9. Looking east into Adit #2. The wire in the right foreground probably covered the opening at one time (Roll K2, frame #24).
3.6 NORTH FORK MINE (Site No. SP-77)
Alternate name—North Fork Development Company.

3.6.1 Site Location and Access (Figure 2.1-1a)

The North Fork Mine is about 1 mile south on Coal Creek from the Coeur d’Alene River in the SW¼ of the NE¼ of the NW¼ of section 31, T. 50 N., R. 3 E., on the Steamboat Creek 7.5-minute quadrangle (Figure 3.6-1). Access from the highway along the river (Forest Highway 9) is on foot (or trail bike) on the Coal Creek-Graham Mountain trail (Forest Service Trail 41). All of the workings are on Forest Service land.

3.6.2 Geologic Features (Figure 2.2-1a)

The mine is in the Revett Formation near the contact with the St. Regis. There are several small faults in the area (Griggs, 1973).

3.6.3 Site History

This mine was the property of the North Fork Development Company, which was incorporated in 1922. Most of the work was done by the company's stockholders. In 1926, there were four tunnels at the mine with reported lengths of: No. 1, 3,000 feet; No. 2, 132 feet; No. 3, 60 feet; and No. 4, 100 feet. The company forfeited its corporate charter in 1953, after doing only minimal assessment work for many years.

3.6.4 Environmental Conditions

3.6.4.1 Site Features

This property was visited by John Kauffman on August 18, 1997. A video segment describing the workings is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 00:38:38-00:52:35). Documenting photos are Roll K6, frames 14-16.

Three adits, all open or partly open, were found at this location. Adit #1 is about 750 feet north of Adits #2 and #3 and may actually be a separate property. However, it is included here for discussion purposes.

Adit #1 (Figure 3.6-2) is adjacent to Trail 41 on the west side of the creek. The adit is about 10-15 feet above creek level and appears to be about 30 feet in length, although the end could not be seen. The entire visible length is untimbered. The waste dump is small, with maximum dimensions of 10 feet long, 5 feet wide, and 10 feet thick (Figure 3.6-3). Coal Creek has probably removed much of the material. Relatively recent spray-painted claim markings are around the adit and along the stream. Some of these may be placer rather than lode claim notices.
Adit #2, the main tunnel on this property, is about 750 feet south of Adit #1. It is on the east side of the creek about 100 feet downstream from a foot bridge across Coal Creek and 20 feet above creek level. The adit is open and has a minor seep trickling from it at a rate of possibly 0.25 gallon per minute. The waste dump parallels the creek and is about 210 feet long, 20 feet wide, and 10-15 feet thick. It is overgrown with dense brush. The adit seep trickles along the east side of the dump several tens of feet before disappearing into the dump material. No oxidized material was on the dump, although very little of the waste material could be observed due to the vegetation.

Adit #3 is about 50 feet south (upstream) from the foot bridge and 20-30 feet uphill from, and west of, the creek. The portal area has caved, but a 3-foot-high by 4-foot-wide opening remains behind the caved debris (Figure 3.6-4). A few of the rotted portal timbers are protruding through the rubble. The waste dump is about 30 feet long, 20 feet wide, and 15 feet thick, and does not quite reach the creek. Most of the dump material is fairly coarse rubble. This dump is also overgrown with large trees and underbrush. A number of the trees were blown over or snapped by last winter's ice storms.

The total disturbed area covers less than 1.0 acre.

3.6.4.2 Sample Locations

3.6.4.2.1 Solid Samples

A sample (K08189702) was collected from Adit #2 waste dump.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K08189702</td>
<td>Adit #2 waste dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.6.4.2.2 Water Samples

An adit water sample (K08189701) was collected from Adit #2.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (µS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
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<tbody>
<tr>
<td>K08189701</td>
<td>North Fork Mine, Adit #2</td>
<td>31</td>
<td>48</td>
<td>8.0</td>
<td>0.25</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.6.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-5), sample K08189702 has a very slightly elevated level of copper (38 ppm) in the element screen. In the TCLP for metals screen, values are below detection limits for all relevant metals.

Water Samples (Tables 2.5-1 and 2.5-2)

In sample K08189701, metal values are all below water quality standards in both the dissolved metals screen and the total recoverable metals screen.

3.6.5 Structures
   No structures were found at this site.

3.6.6 Safety

All of the open adits are potential safety hazards, although Adit #1 appears reasonably competent and stable compared to Adits #2 and #3. Trail 41 appears well used and provides easy access to all three adits, although Adit #2 is well concealed by the vegetation and probably would not be found by most hikers.
Figure 3.6-1. Topographic map of the North Fork Mine, Shoshone County, Idaho (U.S. Geological Survey Steamboat Creek 7.5-minute topographic map).
Figure 3.6-2. Open Adit #1 along Forest Service Trail 41, looking west (Roll K6, frame #14).

Figure 3.6-3. Small waste dump for Adit #1, with Coal Creek in the background. The view is to the east from Forest Service Trail 41 (Roll K6, frame #15).
Figure 3.6-4. Small opening of Adit #3, with sloughed rock and fallen trees nearly obscuring the opening (Roll K6, frame #16).
3.7 BISMARCK PROSPECT (Site No. SP-271)
Alternate name—Bismark Mine.

3.7.1 Site Location and Access (Figure 2.1-1b)

The Bismarck is on the west side of the West Fork of Big Creek about ¾ mile from the confluence of the West Fork with Big Creek. The prospect is in the NW corner of the NE¼ of section 28, T. 48 N., R. 3 E., on the Polaris Peak 7.5-minute quadrangle (Figure 3.7-1). An old jeep trail, now passable only with a four-wheel-drive vehicle, by trail bike, or on foot, follows the north side of the West Fork and crosses the top of the Bismarck waste dump (Figure 3.7-2). A patented claim shown on the National Forest map spans the West Fork and probably includes the portal and waste dump of the mine. The claim is surrounded by Forest Service land.

3.7.2 Geologic Features (Figure 2.2-1a)

The Bismarck is in quartzite of the Revett Formation in a block of ground between the Placer Creek and Big Creek faults. The quartzite in this area strikes northwest and dips moderately to the southwest. Several veins in the underground workings, which have a northeast strike and steep southeasterly dip, appear to be truncated by faults (Hobbs and others, 1965, Plate 2).

3.7.3 Site History

The Bismarck Mining Company was organized in 1924 and apparently purchased the claims from the original locator in exchange for stock in the company. Field examinations by H.M. Childs in 1925 and O.H. Hershey in 1926 both indicate there was little of interest at the Bismarck (IGS mineral property files). Despite this, the company continued developing the property. By 1928, the mine had two tunnels, which were 220 and 1,400 feet long. Little work seems to have been done after that, but the three original claims were patented in 1937.

In 1965, Sunshine Mining Co. gained control of the Bismarck Mining Co. in preparation for expanding its operations to the southwest and into part of the Bismarck group. For the next three years, Sunshine drove an exploration crosscut toward the Bismarck from the 2700 level of the Sun Con area. The results of this program are not known, but there is no further mention of this crosscut after 1968.

3.7.4 Environmental Conditions

3.7.4.1 Site Features

The Bismarck prospect was visited by John Kauffman on August 6, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 00:52:40-00:57:24). Documenting photos are Roll K4, frame 13-16.
The Bismarck adit has a well-framed portal with a steel mesh gate. However, the gate was open at the time of the site visit (Figure 3.7-3). Water flowing from the adit (Figure 3.7-4) has an estimated volume of 5 gallons per minute. The water flows across the surface of the dump and disappears into the dump well above the creek. The waste dump has an hour-glass shape, wide on both ends and very narrow in the middle. It is 255 feet long, a maximum of about 30 feet wide on the northeast end, and at least 60 feet long where it extends down the slope to the creek (Figure 3.7-5). An old road was built across the face of the dump about 30-40 feet down from the upper surface. This road now is overgrown with small saplings and minor amounts of brush. No oxidized material was seen on the dump. A collapsed metal shed (Figure 3.7-6) is about 20 feet southwest of the portal. Scrap metal, old timbers, pipe, and other miscellaneous debris are scattered on and down the face of the dump. The disturbed area is less than 1.0 acre.

### 3.7.4.2 Sample Locations

#### 3.7.4.2.1 Solid Samples

A waste dump sample (K08069702) was collected from the southwest end of the dump below the old road that crosses the dump face.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K08069702</td>
<td>Bismarck waste dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### 3.7.4.2.2 Water Samples

An adit water sample (K08069701) was taken several feet in front of the portal.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (µS)</th>
<th>Temperature (° F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K08069701</td>
<td>Bismarck adit</td>
<td>116</td>
<td>49</td>
<td>8.04</td>
<td>5</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### 3.7.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-5), all values in the element screen are below accepted levels. In the TCLP for metals screen, values are below detection limits for all relevant metals.

100
Water Samples (Tables 2.5-1 and 2.5-2)

Sample K08069701 equals or exceeds all standards for cadmium in the total recoverable metals screen. In the dissolved metals screen, all metals of interest were below detection limits.

3.7.5 Structures

The only structure present is a partially collapsed metal shed just southwest of the portal. The shed had an internal metal frame with corrugated metal sheets on the outer surface. There was at least one concrete pad, which probably supported machinery of some type, inside the northeast corner of the shed.

3.7.6 Safety

The open adit presents a potential safety hazard. This situation could easily be remedied by replacing the present lock or installing a more secure gate. Exploring in or around the metal shed might cause further collapse of the structure. This potential problem could be eliminated by demolishing the building.
Figure 3.7-1. Topographic map of the Bismarck Mine, Shoshone County, Idaho (U.S. Geological Survey Polaris Peak 7.5-minute topographic map).
Figure 3.7-2. Sketch of the Bismarck Mine site.
Figure 3.7-3. Portal of the Bismarck adit, looking northwest. The wire mesh gate at the entrance was open at the time of the site inspection. Water from the adit flows out and to the right of the portal support (Roll K4, frame #13).
Figure 3.7-4. The small stream of water flowing from the adit. The portal is at the top of the photograph (Roll K4, frame #15).
Figure 3.7-5. Looking southwest down the side of the waste dump. The West Fork of Big Creek is in the draw to the left (Roll K4, frame #16).

Figure 3.7-6. Remains of a metal shed or shop building west of the portal (Roll K4, frame #14). The sheets of corrugated metal at the right edge of the photograph are the same as at the left edge of Figure 3.7-3.
3.8 SILVER DALE AND BIG HILL MINE (Site No. SP-277)
Alternative names—Silver Dale Group, Big Hill Group.

3.8.1 Site Location and Access (Figure 2.1-1b)

The Silver Dale and Big Hill Mine is slightly over 2 miles up the West Fork of Big Creek. The mine is on the west side of the creek in the center of the N½ of section 29, T. 48 N., R. 3 E., on the Polaris Peak 7.5-minute quadrangle (Figure 3.8-1). The West Fork trail provides access to within about ¼ mile of the property. This is a four-wheel-drive or bike trail, but it was blocked in places by downed trees at the time of the site visit. The last ¼ mile consists of an overgrown trail that follows the east side of the creek. A slump on the west side of the creek near the waste dump is visible from the trail. Otherwise, the site is densely overgrown with small trees and brush. The workings are on the southern edge of a block of patented claims. Forest Service land surrounds all but the north side of the claims.

3.8.2 Geologic Features (Figure 2.2-1a)

This property is in a wedge of the Revett Formation that is between the Midland and Placer Creek faults (Hobbs and others, 1965, Plate 2).

3.8.3 Site History

The Silver Dale & Big Hill Mining Company was organized in 1917 and purchased the property from the original locator, who managed the mine for a number of years thereafter. The company conducted development work, usually between 100 and 200 feet a year, until the early 1930s. At that time, the mine had three tunnels and a total of 3,438 feet of workings. The mine was inactive until it was sold in 1950 to Silver Belt Lead Mines, Inc.

3.8.4 Environmental Conditions

3.8.4.1 Site Features

This property was visited by John Kauffman on August 6, 1997. A video segment describing the site is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 00:57:28-01:03:03). Documenting photos are Roll K4, frames 17-18.

Two open adits were found at this site, approximately as located on the 7.5-minute topographic map. The lower adit, Adit #1, is in dense brush and trees about 30 feet above, and on the west side of, the creek. Neither the adit nor the dump are obvious from the trail, which is on the other side of the creek. The adit has a wooden frame portal (Figure 3.8-2) with a timbered roof. There is a small cave-in about 20 feet from the portal, but the adit appears at least partially open beyond that. A steady stream of water is flowing inside the adit at about 7 gallons per minute, but it disappears into the floor of the adit inside the portal. It difficult to determine the size of the dump
because of the brush, but it is estimated to be 60 feet long, 30 feet wide, and 25 feet thick. The Adit #1 dump may impinge on the creek. The slump seen from the trail may include dump material or it may be unrelated to the dump. Except for the slump area, the entire slope, including the waste dump, is well stabilized by the vegetation.

The upper adit, Adit #2 (Figure 3.8-3), is at the base of a large cliff. It is about 50 feet uphill from, and 100 feet north of, Adit #1. Adit #2 is in a dense thicket and can only be seen from a few feet away. The dump is estimated to be 15 feet long, 15 feet wide, and 20 feet thick. A conical mound about 10 feet in diameter, presumably of waste rock, is outside the portal of Adit #2 and above what appears to be the main dump for this adit. The upper dump is well above the creek and completely stabilized by the vegetation. The total disturbed area at this property is about 0.75 acre.

3.8.4.2 Sample Locations

3.8.4.2.1 Solid Samples

No solid samples were collected because of the uncertainty in determining the size of the Adit #1 waste dump. In addition, no oxidized material was noted.

3.8.4.2.2 Water Samples

A water sample (K08069705) was collected from the stream flowing from the adit. It should be noted that a water sample was collected from the West Fork of Big Creek about 1 mile upstream from this property (K08069707) and another was collected about 2 miles downstream near the mouth of the West Fork of Big Creek (K08069709).

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (µS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K08069705</td>
<td>Silver Dale Adit #1</td>
<td>40</td>
<td>45</td>
<td>7.7</td>
<td>7</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.8.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

In sample K08069705, cadmium exceeds all standards in the total recoverable metals screen. Cadmium also exceeds all standards in the upstream sample (K08069707) from the West Fork of Big Creek. The downstream sample (K08069709) of the West Fork of Big Creek exceeds the Aquatic Life Chronic standard and is at the lower limit of the Aquatic Life Acute standard for cadmium. In the dissolved metals screens for all samples, none of the standards were exceeded. The West Fork of Big Creek is the drinking water source for the community of Big Creek and the Sunshine Mine.
3.8.5 Structures
   No structures were found at this site.

3.8.6 Safety

Both of the open adits present potential safety hazards. The workings are old and subject to caving.
Figure 3.8-1. Topographic map of the Silver Dale and Big Hill Prospect, Shoshone County, Idaho (U.S. Geological Survey Polaris Peak 7.5-minute topographic map).
Figure 3.8-2. Timbered portal of Adit #1. The timbers are barely visible through the three branches. The view is to the west (Roll K4, frame #18).
Figure 3.8-3. Looking west into the opening of Adit #2.
The rock on the left appears to be brecciated (Roll K4, frame #17).
3.9 ROYAL APEX MINE (Site No. SP-297)

3.9.1 Site Location and Access (Figure 2.1-1b)

The Royal Apex Mine is about 1 mile east of Big Creek along the East Fork of Big Creek in the NE¼ of the SW¼ of section 35, T. 48 N., R. 3 E., on the Polaris Peak 7.5-minute quadrangle (Figure 3.9-1). The workings are on the south side of the creek and can be reached by following the East Fork trail from Forest Service Road 2354 at Big Creek. The property is at the end of a short road that splits from the East Fork trail just before an old metal bridge that spans the creek (Figure 3.9-2). The East Fork trail has several washouts from recent floods but otherwise is easily traversed on foot. The property is on Forest Service land, although there is a group of patented claims to the south.

3.9.2 Geologic Features (Figure 2.2-1a)

The upper Wallace Formation is mapped in the area around the Royal Apex (Hobbs and others 1965, Plates 2 and 3). These rocks are thinly laminated, medium- to dark-gray argillite, banded light- to dark-gray arenaceous dolomite, dolomitic quartzite, and minor argillite. The carbonate-bearing units weather rusty red. Bedding in the vicinity strikes WNW and dips 30-55° NE. The Royal Apex Mine is not shown on Hobbs and others' map, and no veins are depicted or discussed in the vicinity of the property.

3.9.3 Site History

Nothing is known of the history of this site.

3.9.4 Environmental Conditions

3.9.4.1 Site Features

The Royal Apex was visited by John Kauffman on August 7, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:03:08-01:09:02). Documenting photos are K4:20-22.

The adit is completely caved. The only indications of its presence are the waste dump and water flowing out of the slope and across the dump. The flow rate is about 4 gallons per minute. The slope near the adit and the surface of the waste dump are covered with dense brush. Where the adit drainage reaches the surface, there is an area about 15 feet by 15 feet in diameter that is clear of vegetation (Figure 3.9-3). Because of the dense vegetation, it is difficult to estimate the size of the dump. However, a rough approximation is 150 feet long, 30 feet wide, and 40-50 feet thick. No mineralization was seen on the dump, which consisted mostly of dark gray argillite (Figure 3.9-4). The road to the adit crosses obliquely up the side of the waste dump from a flat along the creek. The flat is covered with a mature stand of cedars. A minor amount of scrap metal and a
few old timbers are scattered around the site, mostly on the sides of the dump or on the flat in the cedar grove. The disturbed area covers no more than 1 acre.

3.9.4.2 Sample Locations

3.9.4.2.1 Solid Samples
No dump samples were collected at this site.

3.9.4.2.2 Water Samples

An adit water sample (K08079701) was collected on the surface of the waste dump.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (μS)</th>
<th>Temperature (° F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K08079701</td>
<td>Royal Apex adit</td>
<td>134</td>
<td>47</td>
<td>8.0</td>
<td>4</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.9.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

In sample K08079701, cadmium slightly exceeds the Aquatic Life Chronic standard and was at the lower threshold of the Aquatic Life Acute standard in the total recoverable metals screen.

3.9.5 Structures
No structures were found at this site.

3.9.6 Safety
No safety hazards were identified at this site.
Figure 3.9-1. Topographic map of the Royal Apex Mine, Shoshone County, Idaho (U.S. Geological Survey Polaris Peak 7.5-minute topographic map).
Figure 3.9-2. Sketch of the Royal Apex Mine site.
Figure 3.9-3. Old metal bridge spanning the East Fork of Big Creek. The trail to the Royal Apex Mine splits from the East Fork trail a short distance before this bridge (Roll K4, frame #22).
Figure 3.9-4. Looking southwest at the probable location of the caved adit of the Royal Apex Mine. Water pooling on the dump (lower foreground of the photograph) is the main indication of its presence (Roll K4, frame #20).
Figure 3.9-5. Looking southwest up the face of the waste dump at the Royal Apex Mine from the access trail (Roll K4, frame #21).
3.10 CAPITOL SILVER-LEAD MINE (Site No. WL-221)

3.10.1 Site Location and Access (Figures 2.1-1c)

This property is about ¼ mile up a spur road along the East Fork of Twomile Creek in the SE¼ of section 5, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.10-1). Access is via Forest Service Road 271 to the switchback at the East Fork of Twomile Creek, then up the spur road. The spur road has a dirt berm blocking vehicle access. An adit symbol marks this location on the 7.5-minute topographic map and on the National Forest map. The property is on Forest Service land.

3.10.2 Geologic Features (Figure 2.2-1b)

This prospect is in northwest-striking, northeast-dipping units of the Burke Formation (Hobbs and others, 1965, Plate 3).

3.10.3 Site History

In 1929, the property was held by Wallace-Idaho Lead Mines, Inc. The mine had two tunnels and a total development of about 1,800 feet of workings. A little development was done in the next few years. By 1939, the company reported about 2,000 feet of workings, including a 50-foot vertical shaft. Wallace-Idaho Lead Mines, Inc., forfeited its corporate charter in 1945.

In 1981, Newmont Exploration, Ltd. (which had been exploring the property), paid Capitol Silver Mines, Inc., $27,000 for the right to terminate the agreement under which Newmont had spent $65,000 on a surface and diamond drilling program during the year. In November, Coeur d'Alene Mines Corporation signed an agreement with Capitol Silver to expend $150,000 during the first two years of an exploration venture on Capitol Silver's three hundred claims. The company could terminate the agreement after the expenditure of $100,000. If commercial ore was discovered, Coeur d'Alene Mines was to receive 65 percent of the net profits after recovering preproduction costs and Capital Silver, 35 percent. Preliminary reconnaissance mapping and follow-up geochemical soil sampling were conducted during 1982, and a diamond drill hole was drilled into a promising zone. Evaluation of results continued to delineate more diamond drill targets. In 1983, 636 feet of diamond drilling was done and $113,555 was spent on the property. Expenditures were reduced in 1984, but exploration continued through the following year. The 1985 work included more diamond drilling.
3.10.4 Environmental Conditions

3.10.4.1 Site Features

The Capitol Silver-Lead Mine was visited by Earl Bennett on July 16, 1997. No video was taken at this site. Documenting photo is Roll B1, frame #13.

At this property, there is a partially caved, but open, adit that appears to have had some relatively recent portal work (Figure 3.10-2). It is marked just inside the wooden-frame portal with the new Forest Service abandoned mine warning sign in Spanish and English. A concrete pad is east of the adit. The access road along the East Fork crosses the dump, which has been severely eroded by Twomile Creek. The remainder of the dump measures 60 feet long, 40 feet wide, and 25 feet thick on the nose. None of the material is oxidized or discolored. The disturbed area covers about 0.5 acre.

3.10.4.2 Sample Locations

3.10.4.2.1 Solid Samples

No waste dump samples were collected at this site.

3.10.4.2.2 Water Samples

A water sample (B7169711) was collected downstream from the East Fork of Twomile Creek above FS Road 271.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (µS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7169711, background</td>
<td>downstream, East Fork Twomile Creek</td>
<td>46</td>
<td>50</td>
<td>7.6</td>
<td>---</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.10.4.2.3 Analytical Results

Water Samples (Tables 2.4-1 and 2.4-2)

Background sample B7169711 exceeds the Aquatic Life Chronic value for cadmium in the total recoverable metals screen. In the dissolved metals screen, the sample is below all relevant standards.

3.10.5 Structures

There are no structures at this site.
3.10.6 Safety

Although partially caved, the adit is open and could easily be entered. FS Road 271 is well-traveled and, although the spur road cannot be driven, the adit can easily be reached on foot or by off-road vehicle.
Figure 3.10-1. Topographic map of the Capitol Silver-Lead Mine, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.10-2. Portal of the Capitol Silver-Lead Mine adit (Roll B1, frame #13).
3.11 LEWIS AND CLARK GROUP (Site No. WL-358)

3.11.1 Site Location and Access (Figures 2.1-1d)

The Lewis and Clark Group is on the Little North Fork of the South Fork of the Coeur d'Alene River about three miles north of the confluence with the South Fork. The prospect is in the SW¼ of the SW¼ of section 21, T. 48 N., R. 6 E., on the Lookout Pass 7.5-minute quadrangle (Figure 3.11-1). A good dirt road leads up the Little North Fork from the Old Mullan Road to the site. The property is on Forest Service land.

3.11.2 Geologic Features (Figure 2.2-1b)

The Lewis and Clark Group is in the Burke Formation near the contact with the upper Prichard Formation (Harrison and others, 1986).

3.11.3 Site History

The Lewis & Clark Mining Company was organized in 1907 by the original owners of the property, who traded the claims for stock. By 1914, two of the nine claims were patented and the mine had 450 feet of workings. In 1916, the mine had three tunnels and 600 feet of workings. Development continued until about 1917. After World War I, the company appears to have done little more than assessment work. In 1934, the mine had four tunnels and a total of about 885 feet of workings. The Lewis & Clark Mining Company forfeited its corporate charter in 1940.

3.11.4 Environmental Conditions

3.11.4.1 Site Features

This property was visited by Earl Bennett on August 7, 1997. A video segment describing the prospect is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:09:25-01:12:50). Documenting photos are Roll B9, frames #5-7.

The mine is on the Little North Fork of the Coeur d'Alene River on Forest Service Road 653.1, which becomes FS Trail 133. A partially caved adit with a small dump is by the creek. The adit has an 18-inch opening at the top (Figure 3.11-2) and a small seep. There is not enough water to sample. The dump is about 50 feet in diameter (Figures 3.11-3 and 3.11-4) and contains some bull quartz. The disturbed area is less than 0.5 acre.

3.11.4.2 Sample Locations

3.11.4.2.1 Solid Samples

Sample B8079702 was collected from the waste dump.


<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B8079702</td>
<td>Lewis &amp; Clark Group waste dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.11.4.2.2 Water Samples
No water samples were collected at this site.

3.11.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-2), sample B8079702 has slightly elevated levels of arsenic (140 ppm), cadmium (3.3 ppm), copper (68 ppm), and lead (78 ppm) in the element screen. In the TCLP for metals screen, all relevant metals were below detection limits.

3.11.5 Structures
There are no structures at this site.

3.11.6 Safety
The small opening could easily be enlarged to allow access into the adit. The condition of the underground workings is not known.
Figure 3.11-1. Topographic map of the Lewis and Clark Group, Shoshone County, Idaho (U.S. Geological Survey Lookout Pass 7.5-minute topographic map).
Figure 3.11-2. Small opening at the partially caved adit of the Lewis and Clark Group (Roll B9, frame #5).

Figure 3.11-3. Surface of the Lewis and Clark Group waste dump (Roll B9, frame #6).
Figure 3.11-4. Looking down the face of the waste dump at the Lewis and Clark Group, with the Little North Fork of the Coeur d'Alene River at the base of the dump (Roll B9, frame #7).
3.12 BEACON LIGHT MINE, UPPER WORKINGS (Site No. WL-433)

3.12.1 Site Location and Access (Figures 2.1-1d)

The upper (No. 2) adit of the Beacon Light Mine is on a spur road that turns south off the Old Mullan Road. The mine is beyond the main (lower, or No. 1) adit of the Beacon Light Mine and near the end of the spur road. It is less than ¼ mile east of Interstate 90 in the SE¼ of the SE¼ of section 33, T. 48 N., R. 6 E., on the Lookout Pass 7.5-minute quadrangle (Figure 3.12-1). This property is on Forest Service land.

This site is identified on the videotape as the Princeton-Magna Mine. However, information in IGS's mineral property files indicates that the most of the Princeton-Magna holdings (and the major workings) were on the north side of the South Fork of the Coeur d'Alene River (Nugent, 1973). The adit described here appears to be the upper (No. 2) adit of the Beacon Light Mine, as described by Fryklund (1954). The Beacon Light No. 1 adit was discussed in Volume III of this report (Kauffman and others, 1998).

3.12.2 Geologic Features (Figure 2.2-1b)

The property is in rocks of the St. Regis Formation (Harrison and others, 1986).

3.12.3 Site History

In 1954, there were four adits at the Beacon Light, and the property had been explored for several years. The lower (No. 1) tunnel had about 3,000 feet of workings, and the upper (No. 2) adit had about 2,000 feet of workings. There were two shorter adits above the No. 2 (Fryklund, 1954).

In 1980, Beacon Light Mining Company drilled two exploratory holes on the property. The following year, the company reopened the No. 1 tunnel after it had been caved for over 50 years. Bear Creek Mining Company signed an option agreement with Beacon Light in 1981. In 1983, Anaconda Minerals Company continued exploration of the area around the Beacon Light. In August, diamond drilling and geologic studies were started at the mine. Anaconda dropped its exploration program in the area in 1985.

3.12.4 Environmental Conditions

3.12.4.1 Site Features

This property was visited by Earl Bennett and Virginia Gillerman on July 30, 1997. A video segment describing the property is on the Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:12:55-01:15:59). Documenting photos are Roll B6, frames #19-22.

An old “No Trespassing” sign is on the portal of the open adit (Figure 3.12-2). A fair amount of water flows from the adit and disappears into the dump. It does not impact any active waterway.
The dump is relatively large, about 75 feet long, 20 feet wide, and 15 feet thick. The surface is covered with flowers and weeds (Figure 3.12-3), and the sides are partially overgrown with trees and brush (Figure 3.12-4). There is little scrap at the site except for some rails. The disturbed area covers about 0.5 acre.

3.12.4.2 Sample Locations

3.12.4.2.1 Solid Samples
   No waste dump samples were collected at this site.

3.12.4.2.2 Water Samples

A sample (B7309701) was collected from the adit water.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (µS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
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<tr>
<td>B7309701</td>
<td>Beacon Light Mine, No. 2 adit</td>
<td>102</td>
<td>50</td>
<td>8.4</td>
<td>2</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.12.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

In the dissolved metals screen, sample B7309701 exceeds the Aquatic Life Chronic standard for cadmium and is within the range of the Aquatic Life Acute standard for copper. In the total recoverable metals screen, the sample exceeds the Aquatic Life Chronic standard, is within the range of the Aquatic Life Acute standard, and equals the Primary MCL for cadmium.

3.12.5 Structures
   There are no structures at this site.

3.12.6 Safety

The open adit is the only potential safety hazard at this site.
Figure 3.12-1. Topographic map of the No. 2 adit at the Beacon Light Mine, Shoshone County, Idaho (U.S. Geological Survey Lookout Pass 7.5-minute topographic map).
Figure 3.12-2. Timbered portal of the No. 2 adit of the Beacon Light Mine. The open adit has about 2 gallons per minute of water flowing from it (Roll B6, frame #20).

Figure 3.12-3. Weed- and flower-covered surface of the waste dump at the Beacon Light No. 2 adit (Roll B6, frame #21).
Figure 3.12-4. Looking down the face of the waste dump at the Beacon Light No. 2 adit. The sides are partially covered with trees and brush (Roll B6, frame #22).
3.13 SILVER ROCK PROSPECT (Site No. WL-236)

3.13.1 Site Location and Access (Figures 2.1-1c)

The Silver Rock Prospect is about 1½ miles north of Interstate 90 in the NW¼ of the NW¼ of section 8, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.13-1). The prospect is about ¼ mile up a short spur road that goes west from Twomile Creek Road. An adit symbol on the topographic map accurately locates the prospect, which is on Forest Service land.

3.13.2 Geologic Features (Figure 2.2-1b)

The property is in the upper Prichard Formation (Harrison and others, 1986) near the west end of the Shirttail Gulch fault (Hobbs and others, 1965, Plate 3).

3.13.3 Site History

This property was explored by the Silver Rock Mining Company in the late 1960s and early 1970s, and the company did some diamond drilling in 1972 (U.S. Geological Survey Mineral Resources Data System). Silver Rock's work probably covered most of the prospects in the Twomile Creek area.

3.13.4 Environmental Conditions

3.13.4.1 Site Features

The Silver Rock Prospect was visited by Earl Bennett on July 16, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:16:02-01:18:56). Documenting photo is Roll B1, frame #11.

The prospect consists of an open, dry adit. The wooden portal has “Silver Rock Mining” painted in red letters on the beams (Figure 3.13-2). The back is partially collapsed, but the adit is accessible. The access road crosses the small waste dump (50 feet long, 36 feet wide, and 4 feet thick on the nose). A small drainage ditch crosses the dump from the adit, but the ditch was dry on the day the site was inspected. The disturbed area covers about 0.5 acre.

3.13.4.2 Sample Locations

3.13.4.2.1 Soil Samples

No waste dump samples were collected.

3.13.4.2.2 Water Samples

No water samples were collected.
3.13.5 Structures
   There are no structures at this site.

3.13.6 Safety

The open adit is the only potential safety hazard.
Figure 3.13-1. Topographic map of the Silver Rock Prospect, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.13-2. Wood-framed portal of the open Silver Rock adit (Roll B1, frame #11).
3.14 UNNAMED PROSPECT (Site No. B7169707)

3.14.1 Site Location and Access (Figures 2.1-1c)

This prospect is along the west side of Twomile Creek Road, about 1½ miles north of Interstate 90, in the NW corner of the NE¼ of the NW¼ of section 8, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.14-1). A prospect symbol (x) marks this location on the topographic map. The prospect is on Forest Service land.

3.14.2 Geologic Features (Figure 2.2-1b)

This site is in rocks of the upper Prichard Formation (Harrison and others, 1986) near the Carpenter Gulch and Twomile faults (Hobbs and others, 1965, Plate 3).

3.14.3 Site History

Nothing is known about the history of this site. However, its location suggests that the adit may have been part of the New Hope Mining Company's workings (see Section 3.18, below).

3.14.4 Environmental Conditions

3.14.4.1 Site Features

This prospect was visited by Earl Bennett on July 16, 1997. No video was taken at this site. Documenting photo is Roll B1, frame #10.

This prospect consists of an open adit with a very minor seep. The adit is probably short, judging from the dump, which measures 10 feet long, 20 feet wide, and has small, steep nose. Less than 0.5 acre has been disturbed.

3.14.4.2 Sample Locations

3.14.4.2.1 Soil Samples

No waste dump samples were collected at this site.

3.14.4.2.2 Water Samples

No water samples were collected at this site.

3.14.5 Structures

There are no structures at this site.

3.14.6 Safety

Although it is probably short, the adit is open and easily accessible from Twomile Creek Road. Caving or collapse of rock inside the adit is the main safety hazard at this site.
Figure 3.14-1. Topographic map of Unnamed Prospect B7169707, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
3.15 FLAGSTAFF MINING CO., LTD. (Site No. WL-182)
Alternative name—Flag Staff.

3.15.1 Site Location and Access (Figures 2.1-1c)

The Flagstaff is on the west side of Forest Service Road 271 (Dudley Creek Road) about \( \frac{1}{2} \) mile southwest of the junction with the Beaver Creek Road. The prospect is in the SW\( \frac{1}{4} \) of the NE\( \frac{1}{4} \) of section 34, T. 49 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.15-1) and is on Forest Service land.

3.15.2 Geologic Features (Figure 2.2-1b)

The Flagstaff is in the Wallace Formation near the contact between the Wallace and the St. Regis Formations. Granitic intrusive rocks are also present in the vicinity (Harrison and others, 1986).

3.15.3 Site History

The Flag Staff Mining Co., Ltd., was incorporated in 1900 and forfeited its corporate charter in 1922. In 1921, the property had 800 feet of tunnels and open cuts.

3.15.4 Environmental Conditions

3.15.4.1 Site Features

The Flagstaff property was visited by Earl Bennett on July 24, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:19:19-01:21:03). Documenting photo is Roll B4, frame #7.

The adit at the Flagstaff, which is just off the west side of the Dudley Creek Road, has an opening about 3 feet wide and 14 inches high above some caved debris (Figure 3.15-2). The adit was driven in solid rock with no supporting timbers. There is no dump at the site, which suggests that it was destroyed during construction of the road. The disturbed area is less than 0.2 acre.

3.15.4.2 Sample Locations

3.15.4.2.1 Soil Samples
No waste dump samples were collected at this site.

3.15.4.2.2 Water Samples
No water samples were collected at this site.

3.15.5 Structures
There are no structures at this site.
3.15.6 Safety

The opening to the adit could be enlarged to allow entry. This property is on a well-traveled Forest Service road.
Figure 3.15-1. Topographic map of the Flagstaff Mining Co., Ltd., property, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.15-2. Flagstaff adit on the Dudley Creek Road. The opening is about 3 feet wide and 14 inches high (Roll B4, frame #7).
3.16 EASTERN STAR GROUP (WL-258)
Alternate names—Site Nos. B8139701, B8139702, and B8139703.

3.16.1 Site Location and Access (Figures 2.1-1c)

Three prospects are at the head of Canyon Creek near Glidden Pass in T. 48 N., R. 6 E., on the Thompson Pass 7.5-minute quadrangle (Figure 3.16-1). Although all three locations are described as "unnamed prospect" on the videotape, two of the three adits are believed to be those worked by the Eastern Star Mining Co. in the 1920s and 1930s. Site No. B8139701 is probably the Eastern Star No. 2 adit. It is on the Idaho-Montana border north of Forest Service Road 7623 in the SE¼ of the SE¼ of section 5. Site No. B8139702, which is probably the Eastern Star No. 1 adit, is just south of FS Road 7623 in the NE¼ of the NE¼ of section 8. Site No. B8139703 is on the north side of FS Road 7623 in the NE¼ of the NW¼ of section 8. The prospects are all on Forest Service land.

3.16.2 Geologic Features (Figure 2.2-1b)

These prospects are in the upper Prichard Formation (Harrison and others, 1986).

3.16.3 Site History

The Eastern Star Mining Co., Ltd., was incorporated in 1906. In 1922, the company was working eighteen claims at the head of Canyon Creek near the Idaho-Montana state line. The No. 1 tunnel was 150 feet long and the No. 2 tunnel was 800 feet long. Only assessment work was done on the property for the next two decades. The company forfeited its corporate charter in 1939, but the charter was reinstated in 1955. The company apparently held a block of twelve claims in the vicinity of the company's earlier holdings, but the exact locations of the two claim groups and the correspondence between them is uncertain. This property was included in the block of claims explored by the Burke Mining Co. in the late 1960s and early 1970s.

3.16.4 Environmental Conditions

3.16.4.1 Site Features

The three prospects were visited by Earl Bennett on August 13, 1997. No video was taken at any of the sites. Documenting photos are Roll B10, frames #20-22 (Site No. B8139701), and Roll B10, frame #23 (Site No. B8139703). No photos were taken at Site No. B8139702.

Site No. B8139701 consists of an open, dry adit that had been boarded over, but several of the boards have been removed (Figures 3.16-2 and 3.16-3). The waste dump (Figure 3.16-4) is 60 feet long, 15 feet wide, and 15 feet thick. The dump has ore car rails on the side. This adit is probably the Eastern Star No. 2, the longer of the two adits worked in the 1920s and 1930s. The disturbed area is less than 0.5 acre.
Site No. B8139702, which is believed to be the Eastern Star No. 1 adit, consists of a caved adit. Portal timbers are visible in a cut along the main road. There is no waste dump. The disturbed area is minimal and insignificant.

Site No. B8139703 is also a caved adit, expressed as a brushy scarp on the slope (Figure 3.16-5). The waste dump was apparently destroyed by construction of the road.

3.16.4.2 Sample Locations

3.16.4.2.1 Soil Samples
No waste dump samples were collected at these sites.

3.16.4.2.2 Water Samples
No water samples were collected at these sites.

3.16.5 Structures
There are no structures at these sites.

3.16.6 Safety
The open adit at Site No. B8139701 is the only potential safety hazard at these three sites.
Figure 3.16-1. Topographic map of the Eastern Star Group (Site Nos. B8139701, B8139702 and B139703), Shoshone County, Idaho (U.S. Geological Survey Thompson Pass 7.5-minute topographic map).
Figure 3.16-2. Looking at the Eastern Star No. 2 adit from across the surface of the waste dump at Site No. B8139701 (Roll B10, frame #20).

Figure 3.16-3. Close-up view of the portal at the Eastern Star No. 2 adit (Site No. B8139701). Several of the boards that had blocked the opening have been removed (Roll B10, frame #21).
Figure 3.16-4. Looking from the Eastern Star No. 2 adit across the surface of the waste dump at Site No. B8139701 (Roll B10, frame #22).

Figure 3.16-5. Brushy scarp on the slope at the caved adit of Site No. B8139703 (Roll B10, frame #23).
3.17 BLUE RIBBON GROUP (Site No. WL-304)
Alternative name—Half Moon.

3.17.1 Site Location and Access (Figures 2.1-1c)

The Blue Ribbon Group is at the south end of Lower Glidden Lake in the SE¼ of the NE¼ of section 18, T. 48 N., R. 6 E., on the Thompson Pass 7.5-minute quadrangle (Figure 3.17-1). The mine is reached from the main Canyon Creek road by Forest Service Road 615, which goes around the east side of Lower Glidden Lake. An adit symbol by a spring marks the location of this mine on the topographic map. The property is on Forest Service land.

3.17.2 Geologic Features (Figure 2.2-1b)

The Blue Ribbon Group is in the Burke Formation (Harrison and others, 1986).

3.17.3 Site History

This property was originally held by the Full Moon Mining Company. When that company became insolvent, the claims were relocated by other people. The Blue Ribbon Mining Company was organized in 1914 to take over the property. The claims were purchased, and Blue Ribbon began development work. In 1915, the company reported total workings of 1,500 to 1,600 feet, including two tunnels and a shaft. The upper tunnel was 100 feet long, the lower tunnel was 1,100 feet long, and the shaft was 40 feet deep. The company continued development for the next two decades, usually doing between 50 and 150 feet of work per year. (The low was 35 feet of crosscutting in 1925, and the high was 256 feet of crosscutting in 1930.) Total development in 1930 was 5,250 feet of workings. The tunnel was 2,500 feet long, and the shaft and upper tunnel had been abandoned (although some reports for later years included lengths for these workings). In 1936, the company reported about 3,500 feet of workings and noted that some of the crosscuts had been filled with muck. For the next two years, the company reported 4,000 feet of workings, including four tunnels and one shaft, but again noted that some of the tunnels had been filed. Blue Ribbon Mining forfeited its corporate charter in 1939.

3.17.4 Environmental Conditions

3.17.4.1 Site Features

The Blue Ribbon Group was visited by Earl Bennett on August 13, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:21:05-01:24:21). Documenting photos are Roll B10, frames #24-25, and Roll B11, frames #1-2.

The adit at this prospect is open and has a portal covered with corrugated sheet metal (Figure 3.17-2). A large volume of water (30-50 gallons per minute) flows from beneath rubble in front
of the adit (Figure 3.17-3). The water flows around the east end of the dump, which has been ditched and bermed to guide the flow into a little stream that runs into the lake. The access road crosses the top of the waste dump, which measures about 70 feet long, 70 feet wide, and 80 feet thick (Figure 3.17-4). The disturbed area covers about 1.0 acre.

3.17.4.2 Sample Locations

3.17.4.2.1 Solid Samples

No waste dump samples were collected at this site.

3.17.4.2.2 Water Samples

A sample (B8139704) was collected from the adit water discharge.

<table>
<thead>
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<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (μS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
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<td>B8139704</td>
<td>Blue Ribbon Group adit</td>
<td>38</td>
<td>40</td>
<td>7.3</td>
<td>30-50</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.17.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Sample B8139704 does not exceed any water quality standards.

3.17.5 Structures

There are no structures at this site.

3.17.6 Safety

Lower Glidden Lake receives a significant amount of recreational use, and this adit is easily accessible via the road around Lower Glidden Lake. Caving or collapse of the tunnel is a potential hazard to anyone entering the open adit.
Figure 3.17-1. Topographic map of the Blue Ribbon Group, Shoshone County, Idaho (U.S. Geological Survey Thompson Pass 7.5-minute topographic map).
Figure 3.17-2. View toward the adit (center of photo) at the Blue Ribbon Group (Roll B10, frame #25).
Figure 3.17-3. Close-up of the portal covered with corrugated sheet metal. Water is flowing from the rubble at the bottom of the photograph (Roll B11, frame #1).
Figure 3.17-4. Looking northward across the surface of the waste dump of the Blue Ribbon Group, with Lower Glidden Lake in the distance (Roll B11, frame #2).
3.18 NEW HOPE GROUP (Site No. WL-223)

3.18.1 Site Location and Access (Figures 2.1-1c)

The New Hope Group is about ½ mile up a spur road that goes west from the main Twomile Creek Road, in the SW¼ of section 5, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.18-1). The prospect is on the north side of the gulch at the switchback on the spur road (Figure 3.18-2). The prospect may be on a single patented claim surrounded by Forest Service land.

3.18.2 Geologic Features (Figure 2.2-1b)

The New Hope Group is in the upper Prichard Formation (Harrison and others, 1986) near the Carpenter Gulch fault, which forms the contact between the Prichard Formation and the Burke and Revett formations in this area (Hobbs and others, 1965, Plate 3).

3.18.3 Site History

The New Hope Mining Company was organized in 1900. In 1917, when development stopped, the company held eight claims and the property had an estimated 1,500 feet of workings. When work resumed in 1922, the mine had three tunnels and a total of 1,620 feet of workings. By 1933, the mine had 2,400 feet of workings, and the tunnels were 500, 1,100, and 800 feet long. In 1939, the company acquired two adjoining claim blocks (the Gilbert and Dixie groups). The workings were cleaned out and repaired the following year. The company forfeited its corporate charter in 1941.

3.18.4 Environmental Conditions

3.18.4.1 Site Features

The New Hope Group was visited by Earl Bennett on July 16, 1997. No video was taken at this site. Documenting photo is Roll B1, frame #7.

The prospect has an open, dry adit in solid rock (Figure 3.18-3). Brush covers the lower part of the opening. The waste dump, about 30 feet long and 30 feet wide, was disrupted by construction of the road and its thickness is uncertain. The disturbed area is less than 0.5 acre.

3.18.4.2 Sample Locations

3.18.4.2.1 Soil Samples

No waste dump samples were collected at this site.

3.18.4.2.2 Water Samples

No water samples were collected at this site.
3.18.5 Structures
   There are no structures at this site.

3.18.6 Safety
   The open adit is the only potential safety hazard at this site.
Figure 3.18-1. Topographic map of the New Hope Group, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.18-2. Sketch of the New Hope Group site.
Figure 3.18-3. The open adit (in the center of the photograph behind the brush) at the New Hope Group (Roll B1, frame #7).
3.19 HARDSCRABBLE GROUP (Site No. WL-226)

3.19.1 Site Location and Access (Figures 2.1-1c)

This mine is about 2 miles north of Interstate 90 on the west side of Twomile Creek Road, in the SE1/4 of the SW1/4 of section 5, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.19-1). An adit symbol on the topographic map accurately marks the site. The adit is beside the Twomile Creek Road and just north of the spur road that leads to the New Hope Mine. As with the New Hope Mine, this property may be on a patented claim surrounded by Forest Service land.

3.19.2 Geologic Features (Figure 2.2-1b)

The Hardscrabble Group is in rocks of the Burke Formation near Cretaceous intrusive rocks and close to the Carpenter Gulch and Twomile faults (Hobbs and others, 1965, Plate 3).

3.19.3 Site History

According to the U.S. Geological Survey's Mineral Resources Data System records, the property was mapped by the Bunker Hill Company in 1969 and Sierra Silver Lead Mining Company did some geochemical work in 1973. Nothing else is known of the history of this site.

3.19.4 Environmental Conditions

3.19.4.1 Site Features

This prospect was visited by Earl Bennett on July 16, 1997. No video was taken. Documenting photos are Roll B1, frames #8-9.

This prospect has an open, dry adit with no supporting timbers (Figure 3.19-2). There are no sulfides visible on the dump, which measures 15 feet long, 5 feet wide, and 80 feet thick down the face (Figure 3.19-3). The dump is on a steep slope, however, so the actual thickness is considerably less. Another caved adit may be just below the open adit. The dump for the caved adit appears to be partially buried by the upper dump. The disturbed area covers about 0.5 acre.

3.19.4.2 Sample Locations

3.19.4.2.1 Soil Samples

No waste dump samples were collected at this site.

3.19.4.2.2 Water Samples

No water samples were collected at this site.

3.19.5 Structures

There are no structures at this site.
3.19.6 Safety

The open adit is the only potential safety hazard.
Figure 3.19-1. Topographic map of the Hardscrabble Group, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.19-2. Open adit at the Hardscrabble Group (Roll B1, frame #8).

Figure 3.19-3. Looking up from the base of the waste dump at the Hardscrabble Group (Roll B1, frame #9).
3.20 UNNAMED PROSPECT ON TWOMILE CREEK (Site No. B7169702)

3.20.1 Site Location and Access (Figures 2.1-1c)

This mine is about 200 yards up Twomile Creek from the junction of the main Twomile Creek Road and Forest Service Road 271, in the NE¼ of the SW¼ of section 5, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.20-1). This prospect is shown as an adit symbol on the topographic map. Access is via the Twomile Creek road, and the prospect is on Forest Service land.

3.20.2 Geologic Features (Figure 2.2-1b)

This prospect is in rocks of the Burke Formation near the Carpenter Gulch and Twomile faults (Hobbs and others, 1965, Plate 3).

3.20.3 Site History

Nothing is known about the history of this prospect. However, judging from its location, it may be on the Gilbert claims that were acquired by the New Hope Mining Company in 1939.

3.20.4 Environmental Conditions

3.20.4.1 Site Features

This prospect was visited by Earl Bennett on July 16, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:25:05-01:30:20). Documenting photos are Roll B1, frames #3-5.

Figure 3.20-2 is a sketch of the site. The mine has a gated, wire-covered adit with “Keep Out” and “Danger” signs (Figure 3.20-3). The portal, about 8 feet high and 10 feet wide, appears to have recently been refurbished with steel supports and roof bolts. Part of the wire gate has been ripped open and the top of the portal is caved, allowing access into the adit. There is a slight seep from the portal, but not enough to sample. Twomile Creek is off the east side of the dump, and the access road crosses the dump. Just past the dump to the north, the access road is choked with vegetation. The dump (Figure 3.20-4) measures about 174 feet long, 50 feet wide, and 12 feet thick on the nose. It is stable and was not washed out by the spring floods. The disturbed area is about 1 acre.

3.20.4.2 Sample Locations

3.20.4.2.1 Soil Samples

No waste dump samples were collected.
3.20.4.2.2 Water Samples
   No water samples were collected.

3.20.5 Structures
   There are no structures at this site.

3.20.6 Safety

   The opening above the portal could provide access into the adit.
Figure 3.20-1. Topographic map of Unnamed Prospect (Site No. B7169702), Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.20-2. Sketch of Site No. B7169702.
Figure 3.20-3. Wire-covered portal of the adit at Site No. B7169702. Part of the wire has been torn off (Roll B1, frame #5).

Figure 3.20-4. View across the surface of the waste dump at Site No. B7169702, with the portal to the left (Roll B1, frame #4).
3.21 ROYAL MINE (Site No. SP-125)
Alternative name-Calabria.

3.21.1 Site Location and Access (Figures 2.1-1a)

The Royal Mine is at the junction of Moon Creek and the West Fork of Moon Creek, in the SW¼ of the NE¼ of section 35, T. 49 N., R. 3 E., on the Kellogg East 7.5-minute quadrangle (Figure 3.21-1). An adit symbol marks the location on the topographic map. There is a house north of the adit and across the road to the east (address: #1732 Moon Creek). The mine is either on Forest Service land or on a thin patented claim along Moon Creek.

3.21.2 Geologic Features (Figure 2.2-1a)

The Royal Mine is in the Prichard Formation. An unmineralized vein in the mine workings strikes about N. 45° W. and strikes 55° SW. (Hobbs and others, 1965).

3.21.3 Site History

The Royal Mine was held by the Calabria Mining Company between 1929 and 1937. In 1929, the mine had 1,125 feet of workings, including three tunnels and one shaft. In 1933, the inclined shaft was 310 feet long, and the two remaining tunnels were 500 and 300 feet long. The company discontinued development in 1933 and never resumed work. In 1966, the property consisted of five patented claims. About 1,000 feet of the workings were open, and another several hundred feet of adit was partially caved. The 42-degree inclined shaft was flooded.

3.21.4 Environmental Conditions

3.21.4.1 Site Features

This mine was visited by Earl Bennett on July 17, 1997. A video segment describing the property is on Coeur d’Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:30:25-01:33:25). Documenting photo is Roll B1, frames #24-25.

The mine consists of an open adit (Figure 3.21-2) and an iron-stained dump (Figure 3.21-3) next to the main paved road. Both the adit and dump are clearly visible from the road. The adit was gated, but the gate has been torn off. The opening, which is actually a decline, was driven on a vein in a shear zone in the Prichard Formation. The dump has a considerable amount of sulfides and a noticeable sulfur odor. It measures 20 feet long, 20 feet wide, and 17 feet thick. The disturbed area covers less than 0.5 acre.

3.21.4.2 Sample Locations

3.21.4.2.1 Solid Samples

A waste dump sample (B7179706) was collected from the iron-stained material.
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7179706</td>
<td>Royal Mine waste dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.21.4.2.2 Water Samples
No water samples were collected at this site.

3.21.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-2), sample B7179706 has elevated levels of arsenic (1,700 ppm), cadmium (4.9 ppm), copper (260 ppm), iron (8.2 %), lead (480 ppm), and zinc (230 ppm) in the element screen. In the TCLP for metals screen, the leachable lead value is 0.68 ppm.

3.21.5 Structures
There are no structures at this site.

3.21.6 Safety

The open adit, or decline, is a potential safety hazard. The property is easily accessible and there are nearby homes. Children playing on the dump may be exposed to elevated levels of some metals.
Figure 3.21-1. Topographic map of the Royal Mine, Shoshone County, Idaho (U.S. Geological Survey Kellogg East 7.5-minute topographic map).
Figure 3.21-2. Portal of the adit (decline) at the Royal Mine (Roll B1, frame #24).

Figure 3.21-3. Iron-stained waste dump at the Royal Mine (Roll B1, frame #25).
3.22 SILVERTON PROSPECT, UPPER ADIT (Site No. WL-326)
Alternative names—Climax Group, Happy Jack, Revenue Gulch, Revenue Creek.

3.22.1 Site Location and Access (Figures 2.1-1c)

The upper adit of the Silverton Prospect is located along the east side of Revenue Gulch, just north of Silverton, in the SW 1⁄4 of the SE 1⁄4 of section 15, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.22-1). Access from Silverton is up the Revenue Gulch road, then on a narrow overgrown road that continues up the north-south trending branch of the gulch. The mine is off the west, or downhill, side of the road and is about 200 yards north of the Silverton Prospect. Both the upper and lower adits of the Silverton property are marked on the topographic map with adit symbols. The upper adit of the Silverton Prospect is on a narrow strip of Forest Service land between patented claims to the north and BLM land to the south.

On the videotape, this adit was identified as the Merry Widow Mine. However, this adit is at the location shown for the upper Silverton adit by Hobbs and others (1965, Plate 3). In addition, information in the IGS's mineral property files places the Merry Widow Mine farther up Revenue Gulch. The unnamed adits in upper Revenue Gulch shown on Plate 3 (Hobbs and others, 1965) probably mark the location of the Merry Widow.

3.22.2 Geologic Features (Figure 2.2-1b)

The upper adit of the Silverton Prospect is in the Revett Formation. There are several faults in the vicinity of the mine, and it is less than a mile from the Osburn fault (Hobbs and others, 1965, Plate 3).

3.22.3 Site History

The original four claims were located by H.V. Edwards in 1914, and by 1915 one of the claims (the Monday Morning) was patented. Climax Silver-Lead Mining Company (H.V. Edwards, secretary-manager) was incorporated in 1914 and developed the property for the next decade. By 1925, the property had three tunnels and 2,900 feet of workings.

Four adjacent claims were located in 1922 and worked for a few years by the Happy Jack Mining Company, which also had H.V. Edwards as its secretary-manager. Happy Jack was incorporated in 1924 and leased the Climax Group in the same year. The company did minimal work on the claims for the next three years. In 1929, Happy Jack and Climax Silver-Lead were consolidated, with Climax as the surviving company. No activity was reported at the property after this time, and Climax forfeited its corporate charter in 1942.

Silverton Mines, Inc., was organized in 1945. The new company acquired both this property and the adjacent Paradise Group (lower adit of the Silverton Prospect). After doing some work in the late 1940s, Silverton Mines apparently did only assessment work for many years.
In 1983, Silverton Mines announced a two-year exploration and drilling program on the company's fifteen claims. An agreement was signed with Callahan Mining Corporation in 1984 for Callahan to explore Silverton's seventeen claims, and the lease was revised the following year.

3.22.4 Environmental Conditions

3.22.4.1 Site Features

The upper adit of the Silverton Prospect was visited by Earl Bennett on July 23, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:33:30-01:36:28). Documenting photos are Roll B3, frames #18-19.

Figure 3.22-2 is a sketch of the site. The adit at this property is dry and has a six-inch opening at the top of some caved debris (Figure 3.22-3). The waste dump measures 175 feet long, 40 feet wide, and 75 feet thick on the nose. It is very overgrown with brush. The disturbed area is about 1.0 acre.

3.22.4.2 Sample Locations

3.22.4.2.1 Soil Samples
No waste dump samples were collected.

3.22.4.2.2 Water Samples
No water samples were collected.

3.22.5 Structures
There are no structures at this site.

3.22.6 Safety

The small, narrow opening could be enlarged to provide access into the adit. If the adit is open inside, caving or collapse would pose a potential hazard. No other safety hazards were found at this site.
Figure 3.22-1. Topographic map of the Silverton Prospect, upper tunnel, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.22-2. Sketch of the Silverton Prospect, upper tunnel site.
Figure 3.22-3. Small opening (center of photo) of the Silverton Prospect (upper tunnel), nearly hidden in the brush (Roll B3, frame #18).
3.23 UNNAMED PROSPECT (Site No. B8059701)

3.23.1 Site Location and Access (Figures 2.1-1d)

This prospect is on a sheer cliff near the headwaters of the West Fork of Willow Creek. It is ¼ mile north of Lone Lake, at the center of the NW¼ of section 12, T. 47 N., R. 5 E., on the Mullan 7.5-minute quadrangle (Figure 3.23-1). The adit is visible from the trail along the West Fork of Willow Creek. This prospect is either on a strip of patented claims or on Forest Service land.

3.23.2 Geologic Features (Figure 2.2-1b)

This adit is in the upper St. Regis Formation near its contact with the Wallace Formation. The Reindeer fault is on or near the property (Hobbs and others, 1965, Plate 5).

3.23.3 Site History

Nothing is known about the history of this site.

3.23.4 Environmental Conditions

3.23.4.1 Site Features

This prospect was not visited but was videotaped from the West Fork of Willow Creek trail by Earl Bennett on August 6, 1997. A video segment describing the prospect is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 1:36:30-01:36:48). No photos were taken.

This prospect has a small, open adit and a dump on a very steep hillside on the east side of the headwaters of the West Fork of Willow Creek. The size of the waste dump indicates workings of no more than 100 feet. The disturbed area is less than 0.25 acre.

3.23.4.2 Sample Locations

3.23.4.2.1 Soil Samples

No waste dump samples were collected.

3.23.4.2.2 Water Samples

No water samples were collected.

3.23.5 Structures

No structures were visible from where the site was videotaped.

3.23.6 Safety

The open adit is most likely the only potential safety hazard at this site.
Figure 3.23-1. Topographic map of Unnamed Prospect, Site No. B8059701, Shoshone County, Idaho (U.S. Geological Survey Mullan 7.5-minute topographic map).
3.24 ARGENTA MINE (Site No. WL-459)

3.24.1 Site Location and Access (Figures 2.1-1d)

The Argenta Mine is on the west side of the West Fork of Willow Creek in the SW¼ of the SW¼ of section 1, T. 47 N., R. 5 E., on the Mullan 7.5-minute quadrangle (Figure 3.24-1). The prospect is on the trail along the West Fork that leads to Lone Lake. The trail crosses the waste dump. The property is either on Forest Service land or on a block of patented claims surrounded by Forest Service land.

3.24.2 Geologic Features (Figure 2.2-1b)

The mine is in the St. Regis Formation (Hobbs and others, 1965, Plate 5).

3.24.3 Site History

The Argenta Mining Co., Ltd., was organized in 1906. By 1914, the company held three patented claims and one fractional claim that was not patented. There was development work on the property for most years between 1914 to 1922. In 1922, the property had two tunnels and 1,000 feet of workings. The mine apparently has been idle since then. The Argenta Mining Company forfeited its charter in 1935.

3.24.4 Environmental Conditions

3.24.4.1 Site Features

The Argenta was visited by Earl Bennett on August 5, 1997. No video was taken at this site. Documenting photos are Roll B7, frames #18-19.

This prospect consists of an open adit in solid rock with no portal structure (Figure 3.24-2). A trickle of water is coming out of the adit, but it is not large enough to sample. The road crosses the small dump (Figure 3.24-3). There is a minor amount of copper staining on the dump rocks. The disturbed area is less than 0.5 acre.

3.24.4.2 Sample Locations

3.24.4.2.1 Soil Samples

No waste dump samples were collected.

3.24.4.2.2 Water Samples

No water samples were collected.
3.24.5 Structures
There are no structures at this site.

3.24.6 Safety
The open adit is the only potential safety hazard.
Figure 3.24-1. Topographic map of the Argenta Mine, Shoshone County, Idaho (U.S. Geological Survey Mullan 7.5-minute topographic map).
Figure 3.24-2. Open adit at the Argenta Mine (Roll B7, frame #18).

Figure 3.24-3. Looking down the face of the small waste dump at the Argenta Mine (Roll B7, frame #17).
3.25 SILVER CRESCENT MINE (Site No. SP-121)
Alternative name—Charles Dickens.

The Silver Crescent Mine described below is separate from the Charles Dickens Mine. The Charles Dickens was taken over by the Silver Crescent Mining Company and, therefore, has been referred to at times in the literature as the Silver Crescent Mine. The site described here is the original Silver Crescent property (McNary, 1995; IGS mineral property files).

3.25.1 Site Location and Access (Figures 2.1-1a)

The Silver Crescent is on the main Moon Creek Road, about halfway along the string of mill tailings impoundments from the Charles Dickens Mine, in the SW¼ of section 25, T. 49 N., R. 3 E., on the Kellogg East 7.5-minute quadrangle (Figure 3.25-1). This mine is on Forest Service land.

3.25.2 Geologic Features (Figure 2.2-1a)

The Silver Crescent Mine is in the Prichard Formation (Griggs, 1973).

3.25.3 Site History

McNary (1995, p. 24) gives the following information on the history of the Silver Crescent: According to the Idaho State Inspector of Mines reports, the property later known as the Silver Crescent was incorporated on October 19, 1911, as the Placer Creek Silver-Lead Mining & Milling Co. As of 1921, development on the property consisted of a 1,400-foot-long adit. On August 11, 1922, the name was changed to the Silver Crescent Mining Co. In 1922, development consisted primarily of one 2,000-ft-long adit; about 200 ft of development was done during that year. In 1923, development was principally by a 150-ft-long adit, and about 70 ft of development was done (Campbell, 1921-1924).

In 1924, development at the Silver Crescent was by two adits: the No. 1, which was 80 ft long, and the No. 2, which was 130 ft long. About 70 ft of developmental work was done during the year. In 1925, a third adit about 125 ft long was driven, and 60 ft of development work done. Very little work was done in 1926, at which time total development consisted of five adits. The principal adit was 1,000 ft long (Campbell, 1925-1927). No production was reported from the Silver Crescent workings during the period 1911-1926. From 1926-1937, the Silver Crescent was idle.

In 1937, both the Dickens Mining Co. and the Silver Crescent Mining Co. were consolidated and incorporated under the name Silver Crescent, Inc. . . . (Campbell, 1938, pp. 250-251).
Total development in 1928 was 1,775 feet of workings, and additional claims staked in that year extended the company's property to the West Fork of Moon Creek. By 1933, there were 2,072 feet of workings on the Silver Crescent property. From 1933 through 1935, the company took advantage of the national moratorium on assessment work, but work resumed in 1936. The company staked an additional ten claims and did 1,080 feet of development work. The property had six tunnels, a 30-foot inclined shaft, and 3,302 feet of workings. The Silver Crescent Mining Company and the Dickens Mining Company forfeited their corporate charters in 1937. The properties of both these companies were taken over by Silver Crescent, Inc., which was organized in late 1936. Little work appears to have been done on the Silver Crescent workings after the two properties were combined.

3.25.4 Environmental Conditions

3.25.4.1 Site Features

This site was visited by Earl Bennett on July 17, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:39:10-01:42:08). Documenting photo is Roll B1, frame #23.

The open, wire-gated adit is on the west side of Moon Creek Road and has a Forest Service warning sign posted at the steel-framed portal (Figure 3.25-2). Water is trickling out of the adit. Across the creek from the adit are the tailings from the Charles Dickens mill, which is up the road to the north. There is no dump at this site. It was probably removed or destroyed by road construction, or by erosion from Moon Creek. The disturbed area is less than 0.5 acre.

3.25.4.2 Sample Locations

3.25.4.2.1 Solid Samples

No waste dump samples were collected at this site.

3.25.4.2.2 Water Samples

A water sample (B7179704) was collected from the seep at the adit. A sample was also collected downstream from the Silver Crescent adit and the Charles Dickens mill tailings impoundments, at the gate across the Moon Creek road.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (µS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7179704</td>
<td>Silver Crescent adit</td>
<td>360</td>
<td>60</td>
<td>8.1</td>
<td>&lt;0.5</td>
<td>Yes</td>
</tr>
<tr>
<td>B7179705</td>
<td>downstream from Charles Dickens mill tailings</td>
<td>73</td>
<td>58</td>
<td>7.2</td>
<td>---</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.25.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Sample B7179704 exceeds the Secondary MCL for manganese in the dissolved metals screen. In the total recoverable metals screen, the sample exceeds the Secondary MCL for manganese, and equals or exceeds all standards for cadmium. Arsenic was detected but does not exceed water quality standards.

Sample B7179705 exceeds the Aquatic Life Chronic standard for cadmium and both Aquatic Life standards for zinc in the dissolved metals screen. In the total recoverable metals screen, cadmium and zinc exceed both Aquatic Life standards, cadmium equals the Primary MCL, and lead is at the lower threshold of the Aquatic Life Chronic standard.

3.25.5 Structures
There are no structures at this site.

3.25.6 Safety

The mine is easily accessible from the Moon Creek Road. Although the adit is gated and locked, it could probably be entered by crawling through a narrow opening at the top of the gate.
Figure 3.25-1. Topographic map of the Silver Crescent Mine, Shoshone County, Idaho (U.S. Geological Survey Kellogg East 7.5-minute topographic map).
Figure 3.25-2. Steel-framed, gated portal at the Silver Crescent Mine (Roll B1, frame #23).
3.26 MAY CLAIM PROSPECT (Site No. WL-263)
Alternative names—Silver Hill Group, Mae Group.

3.26.1 Site Location and Access (Figures 2.1-1c)

The May Claim is just off Twomile Creek Road about 1½ miles north of Interstate 90 on the east side of Twomile Creek, near the center of the NW¼ of section 8, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.26-1). There is a prospect symbol (X) on the topographic map at this site. The prospect is on Forest Service land.

3.26.2 Geologic Features (Figure 2.2-1b)

The May Claim Prospect is in rocks of the Prichard Formation near the Shirttail Gulch fault (Hobbs and others, 1965, Plate 3).

3.26.3 Site History
Nothing is known about the history of this site.

3.26.4 Environmental Conditions

3.26.4.1 Site Features

The May Claim Prospect was visited by Earl Bennett on July 16, 1997. No video was taken at the site. Documenting photo is Roll B1, frame #12.

The prospect consists of a caved adit (Figure 3.26-2) with a iron-stained seep and a waste dump that is easily visible from the road. There is a “Keep Out” sign on a tree near the collapsed adit, as well as several sample flags and tags. The seep is discharging at a rate of about 0.5 gallons per minute. The waste dump is about 20 feet long, 20 feet wide, and 15 feet thick. The disturbed area is about 0.5 acre.

3.26.4.2 Sample Locations

3.26.4.2.1 Solid Samples
No waste dump samples were collected at this site.

3.26.4.2.2 Water Samples

A water sample (B7169709) was collected from the iron-stained seep at the caved adit.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (μS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7169709</td>
<td>May Claim adit</td>
<td>210</td>
<td>55</td>
<td>7.6</td>
<td>&lt;0.5</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.26.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Sample B7169709 exceeds the Aquatic Life Chronic standard for cadmium, the Secondary MCL and Aquatic Life Acute standards for iron, and the Secondary MCL for manganese in the dissolved metals screen. In the total recoverable metals screen, cadmium exceeds all standards, iron exceeds the Secondary MCL and Aquatic Life Acute standard, copper exceeds both Aquatic Life standards, and manganese exceeds the Secondary MCL standard.

3.26.5 Structures

There are no structures at this site.

3.26.6 Safety

There are no safety hazards at this site.
Figure 3.26-1. Topographic map of the May Claim Prospect, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.26-2. Caved adit at the May Claim Prospect. An old, leaning, wooden support is at the center of the photo (Roll B1, frame #12).
3.27 HUDLOW MINE (Site No. B7169701)

3.27.1 Site Location and Access (Figures 2.1-1c)

The Hudlow Mine is on Twomile Creek about ½ mile north of the junction of the main Twomile Creek road and Forest Service Road 271 (East Fork of Twomile Creek road). It is in the SW corner of the NE¼ of section 5, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.27-1). Access is via the Twomile Creek road. This property is on Forest Service land.

3.27.2 Geologic Features (Figure 2.2-1b)

The Hudlow Mine is in the Burke Formation near the Carpenter Gulch fault (Hobbs and others, 1965, Plate 3).

3.27.3 Site History

Nothing is known about the history of this site.

3.27.4 Environmental Conditions

3.27.4.1 Site Features

The Hudlow Mine was visited by Earl Bennett on July 16, 1997. No video was taken at the site. Documenting photos are Roll B1, frames #1-2.

The Hudlow Mine, which is marked by an adit symbol shown on the Osburn 7.5-minute quadrangle, has a caved adit with a seep. There is no visible dump. The disturbed area is less than 0.25 acre.

3.27.4.2 Sample Locations

3.27.4.2.1 Solid Samples

No waste dump samples were collected at this site.

3.27.4.2.2 Water Samples

A water sample (B7179701) was collected from the seep at the adit.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (µS)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B7179701</td>
<td>Hudlow adit</td>
<td>56</td>
<td>60</td>
<td>7.1</td>
<td>1</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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3.27.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Sample B7169701 equals the upper limit of the Aquatic Life Chronic standard for cadmium in the dissolved metals screen. In the total recoverable metals screen, the sample exceeds the Primary MCL and Aquatic Life Chronic standards and is within the range of the Aquatic Life Acute standard for cadmium.

3.27.5 Structures
   There are no structures at this site.

3.27.6 Safety
   There are no safety hazards at this site.
Figure 3.27-1. Topographic map of the Hudlow Mine, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
3.28 UNNAMED PROSPECT ON TWOMILE CREEK (Site No. B7169703)

3.28.1 Site Location and Access (Figures 2.1-1c)

This prospect is on the east side of Twomile Creek about 150 feet south of the prospect at Site No. B7169702 (see section 3.20). It is in the NW¼ of the SE¼ of section 5, T. 48 N., R. 4 E., on the Osburn 7.5-minute quadrangle (Figure 3.28-1). The adit is north of the junction of Twomile Creek and the East Fork of Twomile Creek. Access is from the Twomile Creek Road, and the prospect is on Forest Service land.

3.28.2 Geologic Features (Figure 2.2-1b)

This prospect is in rocks of the Burke Formation (Hobbs and others, 1965, Plate 3).

3.28.3 Site History
  Nothing is known about the history of this site.

3.28.4 Environmental Conditions

3.28.4.1 Site Features

This property was visited by Earl Bennett on July 16, 1997. A video segment describing the prospect is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:42:54-01:45:50). Documenting photos are Roll B1, frame #6.

This property consists of an open, gated adit (Figure 3.28-2) and a small waste dump east of the creek and the road. The portal of the adit is similar in appearance to the portal at Site B7169702 (wire gate and warning signs), and both prospects were probably operated at the same time. Water is flowing from the adit at a rate of 5-10 gallons per minute and discharges directly into Twomile Creek. What remains of the dump is 50 feet long, 20 feet wide, and 3 feet thick. The disturbed area is less than 0.5 acre.

3.28.4.2 Sample Locations

3.28.4.2.1 Solid Samples
  No waste dump samples were collected at this site.

3.28.4.2.2 Water Samples

A water sample was collected at the adit (B7169703), and a downstream sample (B7169704) was collected below the adit on Twomile Creek near the junction of Twomile Creek and its east fork.
<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (µS)</th>
<th>Temperature (°F)</th>
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<th>Analyzed (Yes/No)</th>
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<tr>
<td>B7169703</td>
<td>Unnamed Prospect, adit</td>
<td>50</td>
<td>50</td>
<td>6.3</td>
<td>5-10</td>
<td>Yes</td>
</tr>
<tr>
<td>B7169704</td>
<td>downstream on Twomile Creek</td>
<td>48</td>
<td>50</td>
<td>5.9</td>
<td>---</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.28.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

Both samples B7169703 and B7169704 exceed the Aquatic Life Chronic standard for cadmium in the dissolved metals screen. In the total recoverable metals screen for cadmium, both samples exceed the Primary MCL and Aquatic Life Chronic standards and are within the range of the values for the Aquatic Life Acute standard.

3.28.5 Structures

There are no structures at this site.

3.28.6 Safety

The gated portal appears to be secure. No safety hazards were found at the site.
Figure 3.28-1. Topographic map of Unnamed Prospect, Site No. B7169703, Shoshone County, Idaho (U.S. Geological Survey Osburn 7.5-minute topographic map).
Figure 3.28-2. Gated portal of the adit at Site No. B7169703. Water flows from the adit and discharges directly into Twomile Creek (bottom of the photograph) (Roll B1, frame #6).
3.29 CENTRAL PROSPECT (Site No. WL-445) and BANNER MINE (Site No. WL-444)
Alternative names—Boulder Creek Mining and Milling Co., Banner-Idaho.

3.29.1 Site Location and Access (Figures 2.1-1d)

These properties are on the east side of Boulder Creek in the SW¼ of the NW¼ of section 2, T. 47 N., R. 5 E., on the Mullan 7.5-minute quadrangle (Figure 3.29-1). The workings are on a spur road, shown as a jeep trail on the topographic map, that goes east from the Boulder Creek Road. Several adits are noted on the topographic map for this site, and three were found and described. The prospects are on a strip of patented claims surrounded by Forest Service land.

On the videotape, this group of adits was described as the Central Prospect. Adit #1, which is highest on the hillside, is almost certainly part of the Central Prospect. Adit #3, which is next to Boulder Creek, is part of the Banner Mine. The endline separating these two properties is somewhere on the hillside east of Boulder Creek, but IGS's mineral property files do not contain sufficient information to accurately place the location. Because the Central Prospect had several tunnels, Adit #2 is believed to be part of that property, which would place the boundary separating the Central and Banner claim groups somewhere between Adit #2 and Adit #3.

3.29.2 Geologic Features (Figure 2.2-1b)

These prospects are on the same east-west shear zone that contains many of the prospects in this area. The country rock is the St. Regis Formation (Hobbs and others, 1965, Plate 4).

3.29.3 Site History

The Central claim was located in July 1885 and was the first claim staked in this area (Frankovich, 1965). The Boulder Creek Mining & Milling Co., Ltd., was organized in 1906. By 1913, the company held eight claims and one fractional claim, including the patented Central claim. The property had four tunnels and about 1,900 feet of development. Boulder Creek Mining did no work after 1912, and by 1926, the Atlas Mining Company owned 85 percent of the stock in Boulder Creek Mining. The property was merged with that of Atlas Mining Company, and Boulder Creek forfeited its corporate charter in 1927.

Two of the old tunnels on the Central vein were opened, mapped, and sampled in 1966 or 1967 (IGS mineral property files). In 1968, Atlas Mining Co. enlarged and extended a tunnel above Boulder Creek into a new ore-bearing vein. Lead-silver ore was shipped from this discovery the following year. By 1975, Noranda Exploration was in the third year of an exploration program at the Atlas Mine. Extensive underground drilling tested the economic potential of several vein systems, and a 1,500-foot crosscut was driven to test veins at levels greater than 2,000 feet beneath the lowest known points on the property. In 1976, work continued on the drift going west from the Atlas shaft to find the downward projection of the Boulder and Central veins. Average assays indicated 4 ounces of silver and 9 percent lead per ton.
Hecla Mining Company tried to lease the Atlas property in 1977 after the Noranda lease ended. However, the negotiations were stalled by the end of the year. In 1982, as part of a settlement with Atlas Mining Company over subsurface rights to ore in the northern part of the Atlas property adjacent to the Lucky Friday Mine, Hecla began a thirty-month, $1.3 million program on the southern part of the Atlas property. Work started in the fall to rehabilitate the main Atlas tunnel and then drift westerly toward the Boulder Creek vein system. Hecla completed over 1,200 feet of drifting in 1983, and more than 2,900 feet of drifting and over 4,800 feet of diamond drilling on the Boulder Creek vein system in 1984. In January 1985, Hecla terminated the Atlas lease. No ore-grade material was encountered in the Boulder Creek vein system.

The Banner-Idaho Mining Company was organized in 1906. This company worked the Banner Mine, which was adjacent to the Central Prospect and on the same vein. By 1922, the Banner Mine had one 600-foot tunnel, but little work was done after that time. Banner-Idaho Mines, Inc., was organized in 1951, apparently to operate the same group of patented claims. In 1980, Hecla Mining Company tried to purchase an interest in Banner-Idaho Mines, but later withdrew the offer.

3.29.4 Environmental Conditions

3.29.4.1 Site Features

This prospect was visited by Earl Bennett on August 6, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:45:53-01:53:42). Documenting photos are Roll B8, frames #18-22.

Adit #1 (the upper adit) is caved, and a few timbers mark the portal location (Figure 3.29-2). There is a minor seep from the adit. A tributary to Boulder Creek bisects the dump, which measures 30 feet long, 15 feet wide, and 90 feet thick on the nose. Ore car rails extend across the dump. PVC pipe in the creek indicates that this was used as a water supply at one time.

Adit #2 is below Adit #1 and is overgrown by alder thickets. The portal at this adit is caved with many timbers in the debris (Figure 3.29-3). However, there is a small opening that could provide access into the adit. A wooden platform was used to extend the dump (Figure 3.29-4). As at Adit #1, this lower dump is cut in half by the stream. The dump is about the same size as at Adit #1.

Adit #3, thought to be either the Banner Mine or part of the Central Prospect during the field examination, is located along the east side of Boulder Creek. The open adit is about half filled with gravel (Figure 3.29-5) from a gully that passes besides the adit, and there is a sloughed area behind the adit on the hillside. The road up Boulder Creek passes over what is left of the dump, which extends into the Boulder Creek drainage but does not reach the waterway.

Total disturbed area is about 0.5 acre.
3.29.4.2 Sample Locations

3.29.4.2.1 Solid Samples

A sample (B8069701) was collected from the Adit #1 waste dump.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B8069701</td>
<td>Central Prospect Adit #1 dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.29.4.2.2 Water Samples

A water sample (B8069702) was collected below the Adit #2 waste dump from the tributary to Boulder Creek.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (μs)</th>
<th>Temperature (° F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B8069702</td>
<td>tributary to Boulder Creek, downstream</td>
<td>93</td>
<td>55</td>
<td>8.3</td>
<td>---</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.29.4.2.3 Analytical Results

Solid Samples (Tables 2.5-3 and 2.5-4)

Compared to background levels (Tables 1.5-3 and 1.5-4) and environmental standards (Table 1.5-2), sample B8069701 has slightly elevated levels of arsenic (92 ppm), cadmium (5.2 ppm), copper (70 ppm), iron (7.7 %), and a significantly elevated level of lead (21,000 ppm) in the element screen. In the TCLP for metals screen, the sample shows significant leaching for lead.

Water Samples (Tables 2.5-1 and 2.5-2)

In the dissolved metals screen, sample B8069702 is slightly above the lower threshold of the Aquatic Life Acute standard for copper. In the total recoverable metals screen, the sample exceeds the Primary MCL and Aquatic Life Chronic standards and is within the limits of the Aquatic Life Acute standard for cadmium.

3.29.5 Structures

There are no structures at this site.
3.29.6 Safety

Adits #2 and #3 could possibly be cleared sufficiently to be entered. Caving or collapse in the adits would pose a potential safety hazard. No other safety concerns were found at this site.
Figure 3.29-1. Topographic map of the Central Prospect, Shoshone County, Idaho (U.S. Geological Survey Mullan 7.5-minute topographic map).
Figure 3.29-2. Timbers and boards at caved Adit #1 of the Central Prospect (Roll B8, frame #18).

Figure 3.29-3. Boards and timbers at Adit #2 of the Central Prospect. The adit is nearly caved, but has a small opening that could provide access into the workings (Roll B8, frame #19).
Figure 3.29-4. Wooden platform that was used to extend the length of the waste dump at Adit #2 of the Central Prospect (Roll B8, frame #20).

Figure 3.29-5. Portal of Adit #3 (Banner Mine). The adit is about half filled with gravel that washed down the gully beside the opening (Roll B8, frame #21).
3.30 LITTLE GIANT PROSPECT (Site No. WL-446)

3.30.1 Site Location and Access (Figures 2.1-1d)

The Little Giant Prospect is located on a road going from the West Fork of Willow Creek to Boulder Creek. It is about halfway between these drainages in the SE¼ of the NE¼ of section 2, T. 47 N., R. 5 E., on the Mullan 7.5-minute quadrangle (Figure 3.30-1). The property is on an overgrown spur road, about 100 yards east of the newer road that goes up the ridge on the east side of Boulder Creek. The prospect is on a block of patented claims surrounded by Forest Service land.

3.30.2 Geologic Features (Figure 2.2-1b)

This mine is one of several along the east-west trending shear zone that crosses Willow and Boulder creeks and may extend to Gold Creek. Hobbs and others (1965, Plate 5) show this adit as the Lower Giant (#47 on Plate 5) and mapped the rocks as the St. Regis Formation.

3.30.3 Site History

The original claims on the Little Giant property were staked in the late 1890s (Frankovich, 1965). The Idaho Giant Mining Company was incorporated in 1901. By 1913, the company held one unpatented and four patented claims. The property had two tunnels and about 1,100 feet of workings. By 1921, Little Giant had sold the property, and the company disincorporated in 1923.

In 1924, the Atlas Mining Company was organized, and one of the new company's first objectives was to explore the Little Giant and nearby veins vein at depth. The main Atlas tunnel was driven southwesterly, and it passed 1,700 feet vertically below the vein outcrops. This tunnel work was discontinued in 1927 (Frankovich, 1965), and little work was done on the property for the next five decades. According to Frankovich (1965), both the main Atlas tunnel and the Lower Giant tunnel did not extend far enough to intersect the veins because of errors in the interpretation of the geology.

Atlas Mining drilled the Little Giant vein in 1966 and concluded that, contrary to previous expectations, the vein dipped south at a relatively shallow angle. At a depth of 200 feet, the veins were wide but weakly mineralized. Subsequent exploration efforts do not appear to have focused on this part of the Atlas property.

3.30.4 Environmental Conditions

3.30.4.1 Site Features

This mine was visited by Earl Bennett on August 5, 1997. A video segment describing the prospect is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 01:53:46-01:57:20). Documenting photos are Roll B7, frames #13-17.
An open adit (Figures 3.30-2 and 3.30-3) has a considerable flow of water (greater than 10 gallons per minute) coming from it, and the bottom of the water course is heavily iron stained (Figure 3.30-4). The overgrown spur road to this prospect crosses between the adit and the main part of the dump. A piece of drill steel has been driven into the end of the dump, possibly as a survey marker or claim corner. The dump is about 120 feet long, 8 feet wide, and 80 feet thick on the nose (Figure 3.30-5). A sign at the site says “Silver Resources Ltd., Box 70, Wallace, ID”. A corner about 150 feet west of the adit is inscribed MS #9, SW Corner #1, and MS #8, SE Corner #4. The disturbed area at this site covers less than 1.0 acre.

3.30.4.2 Sample Locations

3.30.4.2.1 Solid Samples
No waste dump samples were collected at this site.

3.30.4.2.2 Water Samples
A water sample (B8059702) was collected from the adit.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Specific Conductivity (μs)</th>
<th>Temperature (°F)</th>
<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
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</thead>
<tbody>
<tr>
<td>B8059702</td>
<td>Little Giant adit</td>
<td>38</td>
<td>48</td>
<td>6.9</td>
<td>&gt;10</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.30.4.2.3 Analytical Results

Water Samples (Tables 2.5-1 and 2.5-2)

In the dissolved metals screen, sample B8059702 exceeds the Secondary MCL for manganese and is within the limits of the Aquatic Life Chronic standard for copper. In the total recoverable metals screen, the sample exceeds the Secondary MCL for manganese, the Primary MCL and Aquatic Life Chronic standards for cadmium, and is within the limits of the Aquatic Life Acute standard for cadmium.

3.30.5 Structures
There are no structures at this site.

3.30.6 Safety

The open adit is the only potential safety hazard at this site.
Figure 3.30-1. Topographic map of the Little Giant Prospect, Shoshone County, Idaho (U.S. Geological Survey Mullan 7.5-minute topographic map).
Figure 3.30-2. Open adit at the Little Giant Prospect. A considerable amount of water is flowing from the adit (around the base of the large boulder in the adit opening) (Roll B7, frame #13).

Figure 3.30-3. View inside the Little Giant adit. Some support timbers are still intact. The floor is covered with water a foot or more deep (Roll B7, frame #12).
Figure 3.30-4. Iron-stained water flowing from the Little Giant adit (Roll B7, frame #14).

Figure 3.30-5. Partially overgrown waste dump at the Little Giant Prospect (Roll B7, frame #15).
3.31 CARBONATE HILL MINE (Site No. WL-448)
Alternative name—Carbonate Mine.

3.31.1 Site Location and Access (Figures 2.1-1d)

The Carbonate Hill Mine is located on the west side of Willow Creek near the center of the E½ of
the W½ of section 1, T. 47 N., R. 5 E., on the Mullan 7.5-minute quadrangle (Figure 3.31-1). It
is along the road that goes up the West Fork of Willow Creek and is shown as an adit symbol on
the topographic map. Access from Mullan is on the Old Mullan Road east to the mouth of
Willow Creek, then on the Willow Creek Road over Interstate 90 to the West Fork of Willow
Creek road. The mine is just northwest of the confluence of the East and West forks of Willow
Creek. The access road crosses the surface of the waste dump. This site is on a block of patented
claims surrounded by Forest Service land.

3.31.2 Geologic Features (Figure 2.2-1b)

The Carbonate Hill Mine is in rocks of the St. Regis Formation near several steeply dipping west-
northwest striking faults (Hobbs and others, 1965, Plate 5).

3.31.3 Site History

These claims were staked in earlier 1900 (Frankovich, 1965) and were later acquired by the
Carbonate Hill Mining Company, which was organized in 1906. By 1913, the company held one
unpatented and nine patented claims, and the property had about 2,300 feet of workings. The
mine was optioned in 1918 to the Idaho Carbonate Hill Consolidated Mining Company
(incorporated in 1917) and sold shortly thereafter. In 1918, the mine had 5,785 feet of tunnels,
crosscuts, and drifts, and 137 feet of shafts and winzes. By 1921, Idaho Carbonate Hill
Consolidated had discontinued operations, and the property was transferred to the Atlas Mining
Company in 1924. Atlas reported that the Carbonate Hill had 5,980 feet of tunnels, drifts, and
crosscuts, and 630 feet of raises and winzes at the time of the transfer. The assets of the Idaho
Carbonate Hill Consolidated Mining Company (500,000 shares of Atlas Mining Company stock
paid for the Idaho Carbonate property) were later transferred to Coeur d'Alenes Lead Company,
which it held until the company forfeited its charter in 1964.

Soon after acquiring its property, Atlas began driving a long tunnel southward from near the
South Fork of the Coeur d'Alenes River. This tunnel was intended to expose at depth the veins in
the Carbonate Hill, Little Giant, and Boulder Creek (Central) Groups of the Atlas property. By
1927, the Atlas tunnel was 7,026 feet long and from 700 to 1,800 feet below the old workings. In
1928, the company started drifting eastward toward the Carbonate Hill workings, starting about
1,400 feet north of the face of the Atlas tunnel. The following year, the company extended the
Carbonate Hill drift (so called because it was believed to be following the Carbonate Hill vein)
about 2,400 feet and a crosscut from the drift opened an ore zone (the Bird vein), which was
thought to be a continuation of the veins on the upper levels of the mine. Several hundred tons of
lead ore were shipped from the Bird vein to the Gold Hunter mill in 1930. The company operated the mine from April 1 to August 23, 1931, and shipped 1,260 tons of lead ore. In August 1938, Atlas completed a raise that connected with the Carbonate Hill Tunnel. This raise provided natural ventilation and a second entrance to the mine.

In 1940, Atlas signed an agreement with Hecla Mining Company giving Hecla a five-year option on the property in exchange for sinking an internal shaft near the Bird vein and exploring on the 400 and 800 levels off the shaft. By 1942, the shaft was 800 feet deep and about 1,300 feet of drifting had been done from the 800 level (IGS mineral property files). The Zanetti Brothers produced ore from the Bird vein during World War II, but their operations were restricted by labor shortages (Frankovich, 1965).

In 1951, the Atlas property was again optioned by Hecla, this time in association with Newmont Mining Company and the New Jersey Zinc Company. With Hecla in charge of operations, these companies rehabilitated the mine and, in June 1952, began deepening the internal shaft to the 2400 level. The shaft reached its target depth the following year, and about 2,000 feet of drifts were run on the 2400 level. Newmont surrendered its option to its partners in December 1953. When no important ore was discovered by the tunnel work, Hecla switched to a diamond drilling program in 1954. After completing several thousand feet of drilling, Hecla and New Jersey Zinc surrendered their options in December 1954. Subsequent work in this area appears to have focused on the other parts of the Atlas property.

3.31.4 Environmental Conditions

3.31.4.1 Site Features

The Carbonate Hill Mine was visited by Earl Bennett on August 5, 1997. A video segment describing the property is on Coeur d'Alene Basin (Secondary Properties) Videotape (Tape 1, index 1:57:22-02:02:52). Documenting photos are Roll B7, frames #3-9.

Figure 3.31-2 is a sketch of the site. The adit at the Carbonate Hill Mine has a collapsed wooden portal, but the adit is supported by timbers and is open beyond the portal (Figures 3.31-3 and 3.31-4). The hillside is sloughed above the adit (Figure 3.31-5). This adit has a substantial Y- or mitten-shaped dump (Figure 3.31-6). The east-west lobe of the dump is about 190 feet long, and the north-south lobe is about 150 feet long. The dump is 75 feet thick (Figure 3.31-7). An old wooden storage bin with metal-covered sides, 2 feet wide by 7 feet long, is near the adit (Figure 3.31-8). Just beyond the bin is a stack of asbestos siding (probably dumped here by someone). This pile is about 8 feet long by 4 feet wide. The disturbed area covers about 2 acres.

3.31.4.2 Sample Locations

3.31.4.2.1 Soil Samples

No waste dump samples were collected at this site.
3.31.4.2.2 Water Samples
   No water samples were collected at this site.

3.31.5 Structures
   There are no structures at this site.

3.31.6 Safety

   Although the portal has collapsed, the adit is open and can be entered. Caving and collapse inside the adit are potential safety hazards. There is also a small pile of asbestos siding at the site.
Figure 3.31-1. Topographic map of the Carbonate Hill Mine, Shoshone County, Idaho (U.S. Geological Survey Mullan 7.5-minute topographic map).
Figure 3.31-2. Sketch of the Carbonate Hill Mine site.
Figure 3.31-3. Portal of the Carbonate Hill adit (Roll B7, frame #5).

Figure 3.31-4. Opening behind the collapsed part of the portal at the Carbonate Hill adit (Roll B7, frame #7).
Figure 3.31-5. View across the Carbonate Hill waste dump toward the adit (behind the trail bike). The sloughed hillside can be seen above the adit (Roll B7, frame #3).

Figure 3.31-6. Looking east from the adit across the dump surface (Roll B7, frame #9).
Figure 3.31-7. Looking down the sloping south face of the waste dump at the Carbonate Hill Mine. The dump is about 75 feet thick (Roll B7, frame #4).
Figure 3.31-8. Old wooden storage bin with metal-covered sides near the Carbonate Hill adit (Roll B7, frame #8).
Figure 3.31-9. Small pile of asbestos siding in front of the adit (Roll B7, frame #6).
BIBLIOGRAPHY


Campbell, Stewart, 1921, Twenty-second annual report of the mining industry of Idaho for the year 1920: State of Idaho, p. 95.


Campbell, Stewart, 1924, Twenty-fifth annual report of the mining industry of Idaho for the year 1923: State of Idaho, p. 192.

Campbell, Stewart, 1925, Twenty-sixth annual report of the mining industry of Idaho for the year 1924: State of Idaho, p. 217.


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Appendix A
Field Questionnaire
PART A
(To be completed for all identified sites)

LOCATION AND IDENTIFICATION

ID# __________ Site Name(s) ________________________________
FS Tract # _______________ FS Watershed Code _______________
Forest __________________ District __________________________
Location based on: GPS ____ Field Map ____ Existing Info ____ Other ____
Lat _______ Long _______ xutm ______ yutm ______ zutm ______
Quad Name ___________________________ Principal Meridian ________
Township ___________ Range _________ Section ___ 1/4 ___ 1/4 ___ 1/4
State _____ County ___________ Mining District ______________

Ownership of all disturbances:
____ National Forest (NF)
____ Mixed private and National Forest (or unknown)
____ Private.

If private only, impacts from the site on National Forest Resources are
____ Visually apparent ____ Likely to be significant ____ Unlikely or minimal

If all disturbances are private and impacts to National Forest Resources are unlikely or
minimal - STOP

PART B
(To be completed for all sites on or likely affecting National Forest lands)

SCREENING CRITERIA

Yes  No

____ 1. Mill site or Tailings present
____ 2. Adits with discharge or evidence of a discharge
____ 3. Evidence of or strong likelihood for metal leaching, or AMD (water stains,
stressed or lack of vegetation, waste below water table, etc.)
____ 4. Mine waste in floodplain or shows signs of water erosion
____ 5. Residences, high public use area, or environmentally sensitive area (as listed in
HRS) within 200 feet of disturbance
____ 6. Hazardous wastes/materials (chemical containers, explosives, etc)
____ 7. Open adits/shafts, highwalls, or hazardous structures/debris
____ 8. Site visit (If yes, take picture of site), Film number(s)

If yes, provide name of person who visited site and date of visit
Name: ______________________ Date: ______________

If no, list source(s) of information (If based on personal knowledge,
provide name of person interviewed and date):

If the answers to questions 1 through 6 are all No - STOP

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PART C
(To be completed for all sites not screened out in Parts A or B)

Investigator ___________________________ Date ____________
Weather ______________________________

1. GENERAL SITE INFORMATION

*Take panoramic picture(s) of site, Film Number(s) ___________________________

Size of disturbed area(s) _____ acres  Average Elevation _____ feet
Access: _____ No trail _____ Trail _____ 4wd only _____ Improved road
       _____ Paved road

Name of nearest town (by road): _________________________________

Site/Local Terrain: _____ Rolling or flat _____ Foothills _____ Mesa _____ Mountains
       _____ Steep/narrow canyon

Local undisturbed vegetation (Check all that apply): _____ Barren or sparsely vegetated
       _____ weeds/grasses _____ Brush _____ Riparian/marsh
       _____ Deciduous trees _____ Pine/spruce/fir

Nearest wetland/bog: _____ On site, _____ 0-200 feet, _____ 200 feet-2 miles, _____ > 2 miles

Acid Producers or Indicator Minerals: _____ Arsenopyrite, _____ Chalcopyrite, _____ Galena,
       _____ Iron Oxide, _____ Limonite, _____ Marcasite, _____ Pyrite, _____

Pyrrhotite, _____ Sphalerite, _____ Other Sulfide

Neutralizing Host Rock: _____ Dolomite, _____ Limestone, _____ Marble, _____ Other Carbonate

2. OPERATIONAL HISTORY

Dates of significant mining activity ____________________________

**MINE PRODUCTION**

<table>
<thead>
<tr>
<th>Commodity(s)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Production (ounces)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

Years that Mill Operated ________________________________

Mill Process: _____ Amalgamation, _____ Arrastre, _____ CIP (Carbon-in-Pulp), _____ Crusher
only,
       _____ Cyanidation, _____ Flotation, _____ Gravity, _____ Heap Leach, _____ Jig Plant, _____
Leach, _____ Retort, _____ Stamp, _____ No Mill, _____ Unknown

**MILL PRODUCTION**

<table>
<thead>
<tr>
<th>Commodity(s)</th>
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</table>

<table>
<thead>
<tr>
<th>Production (ounces)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
3. HYDROLOGY

Name of nearest Stream ____________ which flows into _______________
Springs (in and around mine site): _____ Numerous _____ Several _____ None
Depth to Groundwater __ ft, Measured at: ____ shaft/pit/hole ____ well ____ wetland
Any waste(s) in contact with active stream ____ Yes ____ No

4. TARGETS (Answer the following based on general observations only)

Surface Water
Nearest surface water intake ____ miles, Probable use _______________
Describe number and uses of surface water intakes observed for 15 miles downstream of site:

Wells
Nearest well ____ miles, Probable use _______________
Describe number and use of wells observed within 4 miles of site:

Population
Nearest dwelling ____ miles, Number of months/year occupied ______ months
Estimate number of houses within 2 miles of the site (Provide estimates for 0-200ft, 200ft-1mile, 1-2miles, if possible)

Recreational Usage
Recreational use on site: ____ High (Visitors observed or evidence such as tire tracks, trash, graffiti, fire rings, etc.; and good access to site), ____ Moderate (Some evidence of visitors and site is accessible from a poor road or trail), ____ Low (Little, if any, evidence of visitors and site is not easily accessible)
Nearest recreational area ____ miles, Name or type of area: ____________________________

5. SAFETY RISKS

____ Open adit/shaft, ____ Highwall or unstable slopes, ____ Unstable structures,
____ Chemicals, ____ Solid waste including sharp rusted items, ____ Explosives
6. MINE OPENINGS

Include in the following chart all mine openings located on or partially on National Forest lands. Also, include mine openings located entirely on private land if a point discharge from the opening crosses onto National Forest land. In this case, enter data for the point at which the discharge flows onto National Forest land; you do not need to enter information about the opening itself.

<table>
<thead>
<tr>
<th>TABLE 1 - ADITS, SHAFTS, PITS, AND OTHER OPENINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Number</td>
</tr>
<tr>
<td>Type of Opening</td>
</tr>
<tr>
<td>Ownership</td>
</tr>
<tr>
<td>Opening Length (ft)</td>
</tr>
<tr>
<td>Opening Width (ft)</td>
</tr>
<tr>
<td>Latitude (GPS)</td>
</tr>
<tr>
<td>Longitude (GPS)</td>
</tr>
<tr>
<td>Condition</td>
</tr>
<tr>
<td>Ground water</td>
</tr>
<tr>
<td>Water Sample #</td>
</tr>
<tr>
<td>Photo Number</td>
</tr>
</tbody>
</table>

Comments (When commenting on a specific mine opening, reference opening number used in Table 1):

Codes Applicable for all entries: NA= Not applicable, UNK=Unknown, OTHER=Explain in comments, NO=NO or none
Type of opening: ADIT=Adit, SHAFT=Shaft, Pit=Open Pit/Trench' HOLE=Prospect Hole, WELL=Well
Ownership: NF=National Forest, MIX=National Forest and Private (Also, for unknown), PRV=Private
Condition (Enter all that apply): INTACT=Intact, PART=Partially collapsed or filled, COLP=Filled or collapsed, SEAL=Adit plug, GATE=Gated barrier,
Ground water (Water or evidence of water discharging from opening): NO= No water or indicators of water, FLOW= Water flowing, INTER=Indicators of intermittent flow, STAND= Standing water only (In this case, enter an estimate of depth below grade)
7. MINE/MILL WASTE

Include in the following chart all mine/mill wastes located on or partially on National Forest lands. Also, include mine/mill wastes located entirely on private land if it is visibly affecting or is very likely to be affecting National Forest resources. In this case enter data for the point at which a discharge from the waste flows onto National Forest land, or where wastes have migrated onto National forest land; only enter as much information about the waste as relevant and practicable.

TABLE 2 - DUMPS, TAILINGS, AND SPOIL PILES

<table>
<thead>
<tr>
<th>Waste Number</th>
<th>Waste Type</th>
<th>Ownership</th>
<th>Area (acres)</th>
<th>Volume (cu yds)</th>
<th>Size of Material</th>
<th>Wind Erosion</th>
<th>Vegetation</th>
<th>Surface Drainage</th>
<th>Indicators of Metals</th>
<th>Stability</th>
<th>Location with respect to Floodplain</th>
<th>Distance to Stream</th>
<th>Water Sample #</th>
<th>Waste Sample #</th>
<th>Soil Sample #</th>
<th>Photo Number</th>
</tr>
</thead>
</table>

Codes Applicable for all entries: NA= Not applicable, UNK=Unknown, OTHER= Explain in comments, NO=NO or none
Waste Type: WASTE=Waste rock dump, MILL=Mill tailings SPOIL=Overburden or spoil pile, HIGH=Highwall, PLACER=Placer or hydraulic deposit, POND=Settling pond or lagoon, ORE=Ore Stockpile, HEAP=Heap Leach
Ownership: NF=National Forest, MIX=National Forest and Private (Also, for unknown), PRV=Private
Size of material (If composed of different size fractions, enter the sizes that are present in significant amounts): FINE=Finer than sand, SAND=sand, GRAVEL>=sand and <2", COBBLE=2"-6", BOULD>=6"
Wind Erosion, Potential for: HIGH=Fine, dry material that could easily become airborne, airborne dust, or windblown deposits, MOD=Moderate. Some fine material, or fine material that is usually wet or partially cemented, LOW=Little it any fines, or fines that are wet year-round or well cemented.
Vegetation (density on waste): DENSE=Ground cover > 75%, MOD=Ground cover 25% - 75%, SPARSE=Ground cover < 25%, BARREN=Barren
Surface Drainage (Include all that apply): RILL-Surface flow channels mostly < 1' deep, GULLY=Flow channels >1' deep, SEEP=Intermittent or continuous discharge from waste deposit, POND=Seasonal or permanent ponds on feature, BREACH=Breached, NO=No indicators of surface flow observe
Indicators of Metals (Enter as many as exist): NO=No, VEG=Absence of or stressed vegetation, STAIN=yellow, orange, or red precipitate, SALT=Salt deposits, SULF=Sulfides present
Stability: EMER-imminent mass failure, LIKE=Potential for mass failure, LOW=mass failure unlikely
Location w/respect to Stream: IN=In contact with normal stream, NEAR=In riparian zone or floodplain, OUT=Out of floodplain

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8. SAMPLES

Take samples only on National Forest lands.

<table>
<thead>
<tr>
<th>TABLE 3 - WATER SAMPLES FROM MINE SITE DISCHARGES</th>
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<tbody>
<tr>
<td>Sample Number</td>
</tr>
<tr>
<td>Date sample taken</td>
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<tr>
<td>Sampler (Initials)</td>
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<tr>
<td>Discharging From</td>
</tr>
<tr>
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<td>Indicators of Metal Release</td>
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<td>Indicators of Sedimentation</td>
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<td>Sample Longitude</td>
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<td>Field SC</td>
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<tr>
<td>Flow (gpm)</td>
</tr>
<tr>
<td>Method of measurement</td>
</tr>
<tr>
<td>Photo Number</td>
</tr>
</tbody>
</table>

Comments: *(When commenting on a specific water sample, reference sample number used in Table 3):*

Codes Applicable for all entries: NA=Not applicable, UNK=Unknown, OTHER=Explain in comments, NO=NO or none

Discharging From: ADIT=Adit, SHAFT=Shaft, PIT=Pit/Trench, HOLE=Prospect Hole, WASTE=Waste rock dump, MILL=Mill tailings, SPOIL=Overburden or spoil pile, HIGH=Highwall, PLACER=Placer or hydraulic deposit, POND=Settling pond or lagoon, WELL=Well

Feature Number: Corresponding number from Table 1 or Table 2 *(Opening Number or Waste Number)*

Indicators of Metal Release *(Enter as many as exist): NO=None, YEG=Absence of, or stressed vegetation/organisms in and along drainage path, STAIN=yellow, orange, or red precipitate, SALT=Salt deposits, SU= Sulphides present, TURB=Discolored or turbid discharge*

Indicators of Sedimentation *(Enter as many as exist): NO=None, SLIGHT=Some sedimentation in channel, banks and channel largely intact, MOD=Sediment deposits in channel, affecting flow patterns, banks largely intact, SIGN=Sediment deposits in channel and/or along stream banks extending to nearest stream*

Method of Measurement: EST=Estimate, BUCK=Bucket and time, METER=Flow meter
### TABLE 4 - WATER SAMPLES FROM STREAM(S)

<table>
<thead>
<tr>
<th>Location relative to mine site/features</th>
<th>Upstream (Background)</th>
<th>Downstream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date sample taken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sampler (Initials)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stream Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators of Metal Release</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators of Sedimentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Latitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Longitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field pH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field SC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow (gpm)Method of measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method of measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photo Number</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments: *(When commenting on a specific water sample, reference sample number used in Table 4):*  

---

**Codes Applicable for all entries:**  
NA: Not applicable, UNK: Unknown, OTHER: Explain in comments, NO: NO or none  
**Indicators of Metal Release** *(Enter as many as exist):* NO= None, VEG= Absence of, or stressed streamside vegetation/organisms in and along drainage path, STAIN= yellow, orange, or red precipitate, SALT= Salt deposits, SULF= Sulfides present, TURB= Discolored or turbid discharge  
**Indicators of Sedimentation** *(Enter as many as exist):* NO= None, SLIGHT= Some sedimentation in channel, natural banks and channel largely intact, MOD= Sediment deposits in channel, affecting stream flow patterns, natural banks largely intact, SIGN= Sediment deposits in channel and/or along stream banks extending 1/2 a mile or more downstream  
**Method of Measurement:** EST= Estimate, BUCK= Bucket and time, METER= Flow meter
TABLE 5 - WASTE SAMPLES

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Date of sample</th>
<th>Sampler (Initials)</th>
<th>Sample Type</th>
<th>Waste Type</th>
<th>Feature Number</th>
<th>Sample Latitude</th>
<th>Sample Longitude</th>
<th>Photo Number</th>
</tr>
</thead>
</table>

Comments: *(When commenting on a specific waste or soil sample, reference sample number used in Table 5):*

Codes Applicable for all entries: NA=Not applicable, UNK=Unknown, OTHER=Explain in comments, NO=NO or none

**Sample Type:** SING=Single sample, COMP=composite sample (enter length)

**Waste Type:** WASTE=Waste rock dump, MILL=Mill tailings, SPOIL=Overburden or spoil pile, HIGH=Highwall, PLACER=Placer or hydraulic deposit, POND=Settling pond or lagoon sludge, ORE=Ore Stockpile, HEAP=Heap Leach

**Feature Number:** Corresponding number from Table 2 *(Waste Number)*
TABLE 6 - SOIL SAMPLES

<table>
<thead>
<tr>
<th>Sample Number</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of sample</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sampler (Initials)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Latitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Longitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likely Source of Contamination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feature Number</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators of Contamination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Photo Number</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments: (When commenting on a specific waste or soil sample, reference sample number used in Table 6):

**Codes Applicable for all entries:** NA= Not applicable, UNK=Unknown, OTHER=Explain in comments, NO=NO or none

**Sample Type:** SING=Single sample, COMP=composite sample (enter length)

**Likely Source of Contamination:** ADIT=Adit, SHAFT=Shaft, PIT=Open Pit, HOLE=Prospect Hole, WASTE=Waste rock dump, MILL=Mill tailings, SPOIL=Overburden or spoil pile, PLACER=Placer or hydraulic deposit, POND=Settling pond or lagoon, ORE=Ore Stockpile, HEAP=Heap Leach

**Feature Number:** Corresponding number from Table 1 or 2 (Opening or Waste Number)

**Indicators of Contamination** (Enter as many as exist): NO=None, VEG=Absence of vegetation, PATH=Visible sediment path, COLOR= Different color of soil than surrounding soil, SALT=Salt crystals
9. HAZARDOUS WASTES/MATERIALS

TABLE 7 - HAZARDOUS WASTES/MATERIALS

| Waste Number | Type of Containment | | |
| Condition of Containment | | | |
| Contents | | | |
| Estimated Quantity of Waste | | | |

Comments: (When commenting on a specific hazardous waste or site condition, reference waste number used in Table 7):

Codes Applicable for all entries: NA= Not applicable, UNK=Unknown, OTHER=Explain in comments, NO=NO or none
Type of Containment: NO=None, LID=drum/barrel/vat with lid, AIR=drum/barrel/vat without lid, CAN=cans/jars, LINE=lined impoundment, EARTH=unlined impoundment
Condition of Containment: GOOD=Container in good condition, leaks unlikely, FAIR=Container has some signs of rust, cracks, damage but looks sound, leaks possible, POOR=Container has visible holes, cracks or damage, leaks likely, BAD=Pieces of containers on site, could not contain waste
Contents: from label if available, or guess the type of waste, e.g., petroleum product, solvent, processing chemical
Estimated Quantity of Waste: Quantity still contained and quantity released
10. STRUCTURES

For structures on or partially on National forest lands.

<table>
<thead>
<tr>
<th>TABLE 8 - STRUCTURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Number</td>
</tr>
<tr>
<td>Condition</td>
</tr>
<tr>
<td>Photo Number</td>
</tr>
</tbody>
</table>

Comments:

Codes Applicable for all entries: NA=Not applicable, UNK=Unknown, OTHER=Specify in comments, NO=NO or none
Type: CABIN=Cabin or community service (store, church, etc.), MILL=mill building, MINE=building related to mining operation, STOR=storage shed, FLUME=Ore chute/Flume or tracks for ore transport
Number: Number of particular type of structure all in similar condition or length in feet
Condition: GOOD=all components of structure intact and appears stable, FAIR=most components present but signs of deterioration, POOR=major component (roof, wall, etc) of structure has collapsed or is on the verge of collapsing, BAD=more than half of the structure has collapsed

11. MISCELLANEOUS

Are any of the following present? (Check all that apply): _____ Acrid Odor, _____ Drums, _____ Pipe, _____ Poles, _____ Scrap Metal, _____ Overhead wires, _____ Overhead cables, _____ Headframes, _____ Wooden Structures, _____ Towers, _____ Power Substations, _____ Antennae, _____ Trestles, _____ Powerlines, _____ Transformers, _____ Tramways, _____ Flumes, _____ Tram Buckets, _____ Fences, _____ Machinery, _____ Garbage

Describe any obvious removal actions that are needed at this site:

General Comments/Observations (not otherwise covered)
12. SITE MAP

Prepare a sketch of the site. Indicate all pertinent features of the site and nearby environment. Include all significant mine and surface water features, access roads, structures, etc. Number each important feature at the mine site and use these numbers throughout this form when referring to a particular feature (Tables 1 and 2). Sketch the drainage routes off the site into the nearest stream.
13. RECORDED INFORMATION

Owner(s) of patented land
Name: ____________________________________________
Address: ________________________________________
Telephone Number: ________________________________

Claimant(s)
Name: __________________________________________
Address: ________________________________________
Telephone Number: ________________________________

Surface Water (From water rights)
Number of Surface Water Intakes within 15 miles downstream of site used for:
___ Domestic, ___ Municipal, ___ Irrigation, ___ Stock,
___ Commercial/Industrial, ___ Fish Pond, ___ Mining,
___ Recreation, ___ Other

Wells (From well logs)
Nearest well _____ miles
Number of wells within _____ 0-1/4 miles _____ 1/4-1/2 miles, _____ 1/2-1 mile
_____ 1-2 miles _____ 2-3 miles _____ 3-4 miles of site

Sensitive Environments
List any sensitive environments (as listed in the HRS) within 2 miles of the site or along receiving
stream for 15 miles downstream of site (wetlands, wilderness, national/state park, wildlife refuge,
wild and scenic river, T&E or T&E habitat, etc):

__________________________________________________

Population (From census data)
Population within _____ 0-1/4 miles _____ 1/4-1/2 miles _____ 1/2-1 mile
_____ 1-2 miles _____ 2-3 miles _____ 3-4 miles of site

Public Interest
Level of Public Interest: _____ Low, _____ Medium, _____ High
Is the site under regulatory or legal action? _____ Yes, _____ No

Other sources of information (MILs #, MRDS #, other sampling data, etc):

__________________________________________________
Appendix B
Database Fields
Eagle Creek Mine


EAGLE CREEK MINE

GOLD

BURKE

WALLACE

1KM

M

241
Appendix C
Geochemical Data
GEOCHEMICAL DATA

ACCURACY OF GEOCHEMICAL DATA

The following information was received on the subject of the accuracy and the detection limits for the geochemical data presented in this report:

Date: Fri, 24 Oct 1997 10:48:23 PST8PDT
From: Kim Anderson <kanderson@asl.fs.uidaho.edu>
To: Ruth E Vance <rvance@uidaho.edu>
Subject: Re: detection limit accuracy

That is something I put together some years ago for another client. Also Greg Moller [Technical Director, Analytical Sciences Laboratory] had input. Other than that, the refs are included in the discussions I sent [discussion titled “Practical Quantitation Limits”; see next page].

Good Luck
Kim,

Kim A. Anderson, Ph.D.
Asst. Prof. / Food Science and Toxicology Dept.
Chief Chemist / Analytical Sciences Laboratory
University of Idaho
Moscow, Idaho 83844-2201
208-885-7900/FAX 209-885-8937
Practical Quantitation Limits

Sensitivity of an analytical method is often based on its ability to reproducibly detect target analytes above the method noise level. Several similar definitions of this Minimum Detection Level or Limit (MDL) or Limit of Detection (LOD) are currently used. According to the American Chemical Society (ACS) (Principles of Environmental Analysis, p 9):

Limit of detection (LOD) "is defined as the lowest concentration level that can be determined as statistically different from the blank".

Instrument detection limit (IDL) "is the smallest signal above background noise that an instrument can detect reliably and is often equivalent to the LOD".

Method detection limit (MDL) "is the lowest concentration of analyte that can that a method can detect reliably in either a sample or a blank".

ACS recommends the value of LOD to be 3σ for a 99% confidence level, where σ is the standard deviation of the measurement.

Limit of Quantitation (LOQ) "is defined as the level above which quantitative results may be obtained with a specified degree of confidence".

ACS recommends an LOQ of 10σ and this imparts a quantitative measurement uncertainty of +/- 30% in the measured value at this 99% confidence level. ACS contends "quantitative interpretation, decision-making and regulatory actions should be limited to data at or above the limit of quantitation". In particular, ACS states: "Analytical chemists must always emphasize to the public that the single most important characteristic of any result obtained from one or more analytical measurements is an adequate statement of its uncertainty level. Lawyers usually attempt to dispense with uncertainty and try to obtain unequivocal statements; therefore, an uncertainty interval must be clearly defined in cases involving litigation and/or enforcement proceedings. Otherwise, a value of 1.001 without a specified uncertainty, for example, may be viewed as legally exceeding a permissible level of 1."

EPA Methods used for regulatory enforcement use the same definition of MDL. "The method detection limit is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the value is above zero". Since performance of analytical methodology and therefore detection limits vary significantly with non-controllable laboratory to laboratory variables such as the exact type of analytical instrumentation, EPA promulgates the concept of Practical Quantitation Limits (PQL). A PQL is equal to the MDL multiplied by a factor of ten or greater and are published as a general guide to laboratory method performance. The factors can range from ten to ten thousand depending on sample matrix and are intended to allow the laboratory the flexibility to determine the relative performance of an analytical method in a more complex sample matrix. In confirmation of laboratory variability, EPA methods as well as other published analytical methods often estimate detection limits and quantitation limits using a bench-level expert, performance estimate.

Recognition of the 'average performance' nature of the PQL guidelines, EPA states that PQL's "are the lowest concentrations of analytes in (samples) that can be reliably determined within specified limits of precision and accuracy by the indicated methods under routine laboratory operating conditions. The PQL's listed are generally stated to one significant figure. CAUTION: The PQL values in many cases are based only on a general estimate for the method and not on a determination for the individual compounds; PQL's are not a part of the regulation (40 CFR Part 264 Appendix IX, Footnote 6)."
SEE

FOLDER:

Geochem_data

For data
Appendix D
Field Forms for Properties in the Study Area
SEE
FOLDER:
Field_forms
For data
Appendix E
Reports Completed for U.S. Forest Service, Region 1, Field Inspection Program
1997 Reports


1998 Reports


1999 Reports


Kauffman, John, E.H. Bennett, and V.E. Mitchell, 1999, Site inspection report for the abandoned and inactive mines in Idaho on U.S. Forest Service lands (Region 1), Idaho Panhandle
National Forest: Volume V (Section A): Coeur d'Alene River drainage surrounding the Coeur d'Alene mining district (excluding the Prichard Creek and Eagle Creek drainages) [secondary properties]: Idaho Geological Survey unpublished report, 250 p., 1 videotape.