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Field Inspection conducted by John Kauffman
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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 that could impact U.S. 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 area inventoried was the Panhandle National Forests. This volume presents work that was done in the Pierce, North Fork, Powell, and Lochea Ranger Districts of the Clearwater National Forest. 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. Properties north and south of the Coeur d'Alene River drainage were examined during the 1998 field season. In the summer of 1999, field work shifted to lands administered by the Clearwater and Nez Perce National Forests.

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 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 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 (FeS$_2$) and pyrrhotite (Fe$_{1-x}$S). Other sulfides play a minor role in acid generation. Oxidation of iron sulfides forms sulfuric acid (H$_2$SO$_4$), sulfate ions (SO$_4^{2-}$), and reduced iron (Fe$^{2+}$). 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 (FeS$_2$, 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, CuFeS$_2$; galena, PbS; tetrahedrite, (CuFe)$_{12}$Sb$_4$S$_{13}$; 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 [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 [KAl$_3$(SO$_4$)$_2$(OH)$_6$] and jarosite [KFe$_3$(SO$_4$)$_2$(OH)$_6$] will precipitate at a pH of less than 4, depending on SO$_4^{2-}$ and 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 [MnO$_2$] dissolves and manganite [MnO(OH)] precipitates. Manganese is found in mineralized environments as rhodochrosite [MnCO$_3$] and its weathering products.

**Aluminum** solubility is most often controlled by alunite [KAl$_3$(SO$_4$)$_2$(OH)$_6$] or by gibbsite [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, H$_2$AsO$_4$. Arsenic is abundant in metallic mineral deposits as arsenopyrite [FeAsS], enargite [Cu$_3$AsS$_4$], tennantite [Cu$_{12}$As$_4$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 [CdCO$_3$]; when the pH of the soil is below 6, cadmium solubility is controlled by strengite [Cd$_4$(PO$_4$)$_2$]. Octavite is the dominant control on the solubility of cadmium in soils. In water, at low partial pressures of H$_2$S, CdCO$_3$ is easily reduced to CdS.

**Copper** solubility in natural waters is controlled primarily by the amount of carbonate present; malachite [Cu$_2$(OH)$_2$CO$_3$] and azurite [Cu$_3$(OH)$_2$(CO$_3$)$_2$] form when 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 chalcopyrite [CuFeS$_2$], bornite [Cu$_9$FeS$_4$], chalcocite [Cu$_2$S], and tetrahedrite [Cu$_{12}$Sb$_4$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. 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, Stream Sediment, and Mine Waste Sampling Procedures

At sites identified as having a potential problem, the geologist collected soil, rock, stream sediment, 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, stream sediment, 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 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 0.1\textit{N} 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, reference water-quality data at a particular mine site was restricted to upstream surface water samples. However, in some drainages reference samples were collected at sites with no visible contamination and no known mining activity upstream from the sampling location. Reference 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 [Toxicity Characteristic Leaching Procedure (TCLP) for Metals] 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 Cathrall (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 are still useful, especially for estimating background values. For example, an average sample of soil above the Wallace Formation might contain 45 ppm (mg/Kg) lead, 115 ppm (mg/Kg) zinc, 29 ppm (mg/Kg) copper, 0.13 ppm (mg/Kg) mercury, and no detectible 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 compared to the limits postulated by the U.S. EPA for the Clark Fork Superfund site (Table
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>
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 database 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 digit for the month; 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., “99,” if the samples was taken in 1999); and 5) two 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 PIERCE, NORTH FORK, POWELL, AND LOCHSA RANGER DISTRICTS, CLEARWATER, IDAHO, AND SHOSHONE COUNTIES, IDAHO

2.1 INTRODUCTION

This volume, Volume II of the Clearwater National Forest report, describes thirty-three properties in the Pierce, North Fork, Powell, and Lochsa Ranger Districts of the Clearwater National Forest. Volume I of the Clearwater National Forest report described properties in the Palouse Ranger District. Eight properties discussed in this volume reported lode production since 1900, but no property had over 1,000 tons of total lode output. Although gold discoveries in the Pierce area were among the earliest in the state, systematic records of production before 1900 are not available.

The study area covers the Pierce, North Fork, Powell, and Lochsa Ranger Districts, which are in Clearwater, Idaho, and Shoshone counties (Figure 2.1-1). The mineralized areas in the study area are in widely scattered areas in the drainages of the North Fork of the Clearwater and the Lochsa rivers. The northern boundary of the study area is the drainage divide between the North Fork of the Clearwater River and the Little North Fork and St. Joe rivers, and the southern boundary of the study area is the drainage divide between the Lochsa and Selway rivers. In the east, the boundary is the Idaho-Montana state line, and the National Forest boundary forms the western boundary of the study area. The Clearwater National Forest contains enclaves of private land (mostly owned by timber companies but also patented mining claims). Conversely, irregular tracts of National Forest land occur outside the Forest boundary. Access to the area is by unpaved roads from U.S. Highway 12, which traverses the southern and southeastern parts of the area; by numerous Forest Service roads throughout the study area; and by trails that connect to the Forest Service roads. Most of the drainages with past mining activity have dirt roads.

The thirty-three mines and prospects described in this volume are located on eleven 7.5-minute topographic maps (U.S. Geological Survey). The locations of these properties are shown in Figure 2.1-1. Elevations in the study area range from about 1,365 feet on the Middle Fork of the Clearwater River along the western boundary to 7,612 feet at Shale Mountain on the Idaho-Montana border. The area is heavily forested with dense brush and conifers, and the topography is generally steep.

2.1.1 Summary of the Pierce, North Fork, Powell, and Lochsa Ranger Districts Study Area

There were thirty-three mining properties (Table 2.1-1) examined in the Pierce, North Fork, Powell, and Lochsa Ranger Districts. Of these properties, six have the potential to have an environmental impact on or near USFS lands, four have water discharges that exceed one or more water quality standards, and one has both water quality concerns and waste rock impinging on an active waterway. In addition, one site has both water quality concerns and possible mill tailings at the site.

Of the thirty-three sites discussed in this volume, eleven have open adits or shafts. Of these, one property has multiple open workings and three have gated or otherwise secured openings. Some of these openings pose significant safety hazards.
Figure 2.1.1c. Location of properties in the North Fork and Powell Ranger Districts (Idaho Transportation Department Missoula West 1:100,000-scale map).
Table 2.1-1. Summary of properties visited in the Pierce, North Fork, Powell, and Lochsa Ranger Districts. The properties are arranged according to site number. All sites were visited in 1999.

**Explanation:**

**Site Number:** Idaho Geological Survey file number, or field designation number.

**Surface Owner:** FS = Forest Service; P = Private or Patented claims; ? where ownership is uncertain

**Water/Solid Sample:** numbers indicate the number of samples collected.

**Environmental Concerns:** W = 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; D or T - dump or tailings samples that exceed background or environmental standards for one or more elements in the Element Screen, and/or dump or tailings samples that show significant leaching of one or more metals in the TCLP for Metals Screen.

**Physical Conditions:** AO = open adit; AC = caved or otherwise closed adit; AG = gated adit; SO = open shaft; SC = caved shaft; SG = covered, secured shaft; T = trench(es); C = cut(s); P = prospect pit(s). Numbers indicate how many of each are at the site; queried when type or condition of workings is uncertain or unknown.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Mine Name</th>
<th>Surface Owner</th>
<th>Water Samples</th>
<th>Solid Samples</th>
<th>Environmental Concerns</th>
<th>Physical Conditions/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM-17</td>
<td>Clearwater Gold and Copper Mine</td>
<td>P, FS</td>
<td>3</td>
<td>2</td>
<td>W, D</td>
<td>3AC</td>
</tr>
<tr>
<td>HM-41</td>
<td>Moose Mountain</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>no workings found; numerous qtz veins and pegmatite dikes</td>
</tr>
<tr>
<td>HM-45</td>
<td>Lost Cabin lode</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>no workings found</td>
</tr>
<tr>
<td>HM-51</td>
<td>Ann Dee lode</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1P 8-10 ft. diam. x 6 ft. deep</td>
</tr>
<tr>
<td>HM-95</td>
<td>New Red Lead</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1AO, P</td>
</tr>
<tr>
<td>HM-96</td>
<td>Red Lead</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>one very minor P</td>
</tr>
<tr>
<td>HM-101, HM-102</td>
<td>Blacklead Mtn.</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>4AO, 1AC, numerous shallow P</td>
</tr>
<tr>
<td>HM-103</td>
<td>E. &amp; R. Toughluck</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1AO (v. short - 6’), 1SC, several shallow P</td>
</tr>
<tr>
<td>HM-108</td>
<td>Southeast Blacklead Mountain</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1AC, several P</td>
</tr>
<tr>
<td>HM-111</td>
<td>Little Papoose</td>
<td>FS</td>
<td>1</td>
<td></td>
<td>W</td>
<td>1AG, 1AC</td>
</tr>
<tr>
<td>HM-122</td>
<td>Oxford Mine</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1SG</td>
</tr>
<tr>
<td>HM-165</td>
<td>Bond Mine</td>
<td>FS</td>
<td>2</td>
<td>1</td>
<td>W, T(?)</td>
<td>1AO, 1AC, 1SC</td>
</tr>
<tr>
<td>HM-167</td>
<td>Bole Property Mine (Preacher Claims)</td>
<td>FS ?</td>
<td></td>
<td></td>
<td></td>
<td>1SG, 1AC, P, T</td>
</tr>
</tbody>
</table>
Table 2.1-1 (continued). Summary of properties visited in the Pierce, North Fork, Powell, and Lochsa Ranger Districts.

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Mine Name</th>
<th>Surface Owner</th>
<th>Water Samples</th>
<th>Solid Samples</th>
<th>Environmental Concerns</th>
<th>Physical Conditions/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM-169</td>
<td>Wild Rose Mine</td>
<td>FS ?</td>
<td></td>
<td></td>
<td></td>
<td>did not find</td>
</tr>
<tr>
<td>HM-175</td>
<td>Gold Coin Mine</td>
<td>FS</td>
<td></td>
<td></td>
<td>1SC, 1AC</td>
<td></td>
</tr>
<tr>
<td>HM-178</td>
<td>Pistol Grip Mine</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>did not find</td>
</tr>
<tr>
<td>HM-180</td>
<td>Red Cloud Mine</td>
<td>P ?, FS ?</td>
<td>1</td>
<td>W</td>
<td></td>
<td>1AO?, 1AC</td>
</tr>
<tr>
<td>HM-190</td>
<td>Black Diamond Graphite</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>old T not found; no other workings noted</td>
</tr>
<tr>
<td>HM-198</td>
<td>Pioneer Mine</td>
<td>FS</td>
<td></td>
<td></td>
<td>1SO (to ~20 ft.), 1SC</td>
<td></td>
</tr>
<tr>
<td>HM-227</td>
<td>Smith Mine</td>
<td>FS</td>
<td>3</td>
<td>W</td>
<td></td>
<td>2AC, 1SC; 2A not found</td>
</tr>
<tr>
<td>HM-228</td>
<td>Chitwood Mine</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>T and bulldozer C only</td>
</tr>
<tr>
<td>HM-229</td>
<td>Canyon Creek Mine</td>
<td>FS</td>
<td></td>
<td></td>
<td>4AC, 1SO (incline)</td>
<td></td>
</tr>
<tr>
<td>K8029901</td>
<td>French Mountain Prospect</td>
<td>FS</td>
<td>1</td>
<td>W</td>
<td></td>
<td>1AC</td>
</tr>
<tr>
<td>K8029902</td>
<td>Last Chance #4 claim</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>1T</td>
</tr>
<tr>
<td>no site number</td>
<td>Unnamed Prospect</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>did not find—adit on Hemlock Butte 7.5-min. map on ridge west of Trapper Gulch</td>
</tr>
<tr>
<td>K8109901</td>
<td>Hi-Lead Mining</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td>active mine; did not document</td>
</tr>
<tr>
<td>K8119901</td>
<td>Unnamed Prospect</td>
<td>FS</td>
<td></td>
<td></td>
<td>1AO</td>
<td></td>
</tr>
<tr>
<td>K8129901</td>
<td>Unnamed Prospect</td>
<td>FS ?, P ?</td>
<td></td>
<td></td>
<td></td>
<td>1AC</td>
</tr>
<tr>
<td>K8259904</td>
<td>Unnamed Prospect</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>series of large, deep bulldozer C</td>
</tr>
<tr>
<td>K8269902</td>
<td>Placer tunnel</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>150-foot T on Musselshell Creek</td>
</tr>
<tr>
<td>K9019906</td>
<td>Bostonia Prospect</td>
<td>FS</td>
<td></td>
<td></td>
<td>1SC (shallow), small, shallow P</td>
<td></td>
</tr>
<tr>
<td>no site #</td>
<td>Hoodoo Pass Prospect</td>
<td>FS</td>
<td></td>
<td></td>
<td></td>
<td>14 ft. x 14 ft. x 6 ft. deep P (USBM MLA 3-93) was not found</td>
</tr>
</tbody>
</table>
2.2 GEOLOGY

The most recent references showing the geology of the Clearwater National Forest are Mitchell (1996), Lewis and others (1992a, 1992b, 1999), and Stanford (1996a, 1996b, 1996c). The geology and ore deposits of the area are discussed in Thomson and Ballard (1924), Anderson (1930), Staley (1940), Zilka and others (1987), Miller (1992), Causey and Marks (1993), and unpublished reports on individual deposits. Gott and Cathrall (1980) discussed the geochemistry of the Coeur d’Alene district, which is underlain by many of the same rock units as the Clearwater National Forest. A brief description of the geologic framework of the area follows.

Most of the mines and prospects in the study area are hosted by metasedimentary rocks of the Belt Supergroup of Precambrian age, by the Early or Middle Proterozoic Syringa metamorphic sequence, or by granitic or migmatitic rocks related to the Bitterroot lobe of the Idaho batholith (Figure 2.2-1). Eocene granitic plutons surround the Bitterroot lobe on the south, southwest, and north sides, but many of these intrusives are eroded too deeply to show any mineralization (Mitchell, 1996). The characteristics of the various units comprising the Belt Supergroup are shown in Table 2.2-1. Hobbs and others (1965) described the Belt Supergroup units in the Coeur d’Alene area. Recent work on various units in the Belt Supergroup and the Syringa metamorphic sequence is summarized in Roberts (1986) and Berg (1998). The Syringa metamorphic sequence consists of coarse-grained quartz-mica schist, quartzite, and calc-silicate rocks that are interbedded on a scale of decimeters (Lewis and others, 1992b).

Granitic rocks of Cretaceous and early Tertiary age intrude the Belt Supergroup and the Syringa sequence throughout most of the area (Rember and Bennett, 1979; Stanford, 1996a, 1996b, 1996c; Mitchell, 1996). Cretaceous and Early Tertiary granitic rocks occur in much of the southeastern part of the study area (Rember and Bennett, 1979). The most prevalent ore deposits in the area are gold-silver veins, with or without base metals. These veins are probably related to the intrusion of the Idaho batholith (Snee and Lund, 1984).

Low- to moderate-angle faults, which are probably thrusts, have been mapped in the northern part of the Clearwater National Forest. Several sets of high-angle faults occur in the study area. Numerous north-trending high-angle faults in the southern part of the Clearwater National Forest are parallel to the suture zone between the Precambrian and other continental rocks and the Permo-Triassic accreted terranes; the suture zone is to the southwest of the Clearwater National Forest boundary. Northeast-trending faults are related to northwest-southeast extension that occurred during the Eocene. A third set of high-angle faults trends to the northwest, parallel to the Lewis and Clark shear zone. One of these faults, the Glade Creek fault near the southwestern edge of the Clearwater National Forest, is in the trans-Idaho discontinuity and marks the southern boundary of the area where Belt Supergroup rocks are found. Several west-northwest faults in the Clearwater National Forest have been intruded by Tertiary granitic rocks (Mitchell, 1996; Lewis and others, 1999; Stanford, 1996a, 1996b, 1996c).
Figure 2.2-1a. Geology of the properties in North Fork Ranger District, Idaho (Lewis and others, 1999; Stanford, 1996a) pCpq, pCpq = Middle Proterozoic Prichard Formation; pCpq, pCpq = Middle Proterozoic Ravalli Group(?); Yw, Yw, Yeon, Yw, Ww, Yw, = Middle Proterozoic Wallace Formation; Ymg = Middle Proterozoic Mussola Group, undivided; Ym = Middle Proterozoic(?), amphibolite; zm = Cretaceous(?), ultramafic rock; Kpl, Kpl, Kpl = Cretaceous granitic rocks; Tkab = Cretaceous or Eocene(?), gabbroic and dioritic dikes and sills, Tk = Mesozoic(?), lacustrine and fluvial sediments. Qp = Quaternary glacial deposits, Qa, Qa = Quaternary stream alluvium. Dotted line labeled "q" is the garnet isograd.
Figure 2.1-1c. Geology of properties in the North Fork and Powell Ranger Districts (Stanford, 1996c). pCgs = Middle Proterozoic Ravalli Group; pCns = Middle Proterozoic St. Regis Formation (?); Yw, Ywn, Ywnm = Middle Proterozoic Wallace Formation, Yms, = Middle Proterozoic Mount Shields Formation. Yng = Missoula Group, undivided. Pzm = Mesozoic (?) marble, Kgd, Kbgd, Kdi = Cretaceous intrusive rocks; Tcv = Eocene Challis Volcanic Group (?); Trb = Eocene rhyolite breccia; Tg, Tqs = Eocene granitic rocks; Trp = Eocene rhyolite porphyry plugs and dikes; Ts = Miocene (?) lacustrine and fluvial sediments. Qg = Quaternary glacial deposits; Qls = Quaternary landslide deposits; Qal = Quaternary stream alluvium. Short, unlabeled lines are dikes.
Table 2.2-1. Generalized section of the Belt Supergroup (modified from Hobbs and others, 1965, p. 14).

<table>
<thead>
<tr>
<th>Group</th>
<th>Formation</th>
<th>Lithology</th>
<th>Thickness (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missoula</td>
<td>Libby Formation</td>
<td>Laminated black argillite and white siltite, green to gray cherty argillite and siltite, and green to tan silty limestone and dolomite. Mud cracks and ripple marks abundant. Top eroded (Harrison and Jobin, 1963).</td>
<td>1,000+</td>
</tr>
<tr>
<td></td>
<td>Striped Peak</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 [in Coeur d'Alene area].</td>
<td>1,500+</td>
</tr>
<tr>
<td></td>
<td>Formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wallace</td>
<td>Upper part 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>Upper part 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-beded 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>Prichard</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>
</tbody>
</table>
2.3 ECONOMIC GEOLOGY

2.3.1 General Characteristics of the Ore

Most of the mines and prospects in the study area are hosted by granitic or migmatitic rocks related to the Bitterroot lobe of the Idaho batholith, by metasedimentary rocks of the Belt Supergroup of Precambrian age, or by the Early or Middle Proterozoic Syringa metamorphic sequence (Figure 2.2-1). The majority of the mines examined in the study area are gold-silver quartz veins, a few of which contain major amounts of sulfide minerals. These deposits may be hosted in the Idaho batholith or in adjacent metasedimentary rocks, and the veins were the source of much of the gold found in the extensive placers in the study area. Fissure-filling or replacement veins were mined for copper at the Oxford and Clearwater Gold and Copper mines. Contact metamorphic and replacement deposits in the Blacklead Mountain area have been prospected for iron and copper (Zilka and others, 1987).

Production was recorded from eight mines in the study area, but no mine produced over 1,000 tons of ore. All of these mines produced gold and silver, and one also produced copper and zinc.

2.3.2 Summary of Mill Development

The location and history of ore processing mills in the study area is important because a major source of environmental problems in many mining camps is old mill tailings disposal sites. These problems include high metal loadings, which could contaminate waterways, and fine sediment, which could increase loading of the streams or provide a source of wind-blown material. At one time or another, mills were present at the following properties in the study area (ranked by decreasing quantity of mill tailings noted at the site):

Bond Mine — tailings(?)
Gold Coin Mine
Red Cloud Mine
Pioneer Mine

A five-stamp mill was used at the Bond Mine before or during the mid-1920s. An area about 20 feet by 20 feet square is covered to a maximum depth of 5 feet with probable mill tailings.

A small amount of ore was processed with a stamp mill at the Gold Coin Mine in the 1940s. No tailings were noted at the site.

Equipment for a two-stamp mill is at the Red Cloud Mine, but neither a mill building nor any sign of tailings was found. It is not known of this mill ever operated.

The Pioneer Mine had a 5-ton Gibson amalgamation mill in the late 1930s. No remains of this mill were found.
2.4 HYDROLOGY AND HYDROGEOLOGY

The study area covers the Forest Service lands in the drainages of the Lochsa River and the North Fork of the Clearwater River (Figure 2.1-1). Most of the streams in the study area flow into one of these rivers, but a few smaller streams in the Pierce area flow westward into the Clearwater River.

As noted, a number of the mines in the study area are hosted by rocks of the Belt Supergroup or by igneous rocks that have intruded into Belt rocks. Some units of the Belt Supergroup contain significant values of base metals. Table 1.5-3 (based on 998 samples taken in the Coeur d’Alene mining district) shows that rocks in the Wallace Formation contain 41 ppm zinc, 23 ppm lead, 2.4 percent iron, 11 ppm copper, and 0.5 ppm cadmium, and soils developed on the Wallace reflect this metal content (Table 1.5-4, based on 2,298 samples) with 115 ppm zinc, 45 ppm lead, 3.7 percent iron, 29 ppm copper, and 0.5 ppm cadmium. Tables 1.5-3 and 1.5-4 show similar data for the other formations in the Belt Supergroup in the Coeur d’Alene mining district. Water discharges from the mines in the area reflect the metal content of the underlying rocks.

To test whether the high metal content from the Belt Supergroup was impacting stream waters, one reference water sample was collected. The chemical analyses for this sample 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 sample was collected:

- K8029903—Unnamed gulch

Sample K8029903 exceeds the Secondary MCL and the Aquatic Life Chronic standard for aluminum in the dissolved metals screen. In the total recoverable metals screen, this sample exceeds the Secondary MCL for iron.

2.5 SUMMARY OF THE PIERCE, NORTH FORK, POWELL, AND LOCHSA RANGER DISTRICTS

2.5.1 Summary of Environmental Observations

Most of the samples from properties with water discharge exceed EPA water standards for one or more elements (Tables 2.5-1 and 2.5-2). Water quality variances include significant amounts of arsenic at the Bond Mine; aluminum at the Red Cloud Mine; aluminum, arsenic, iron, and manganese at the Smith Mine; and aluminum, iron, and arsenic at the Little Papoose Prospect. Aluminum in excess of one or more water quality standards, which occurred at nearly every property sampled, is the most prevalent water quality variance in the Clearwater National Forest. At three out of the five properties sampled, arsenic also exceeds the Primary MCL. Usually, one or more other elements also exceed at least one standard in these samples. The elements detected in the water samples are also found in the rock units underlying the drainages.
Table 2.4-1. Dissolved metals in the reference water sample from the Pierce Ranger District, Clearwater National Forest. Numbers in bold-face type exceed one or more water quality standards.

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>Location</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>X8029903</td>
<td>Unnamed gulch, reference</td>
<td>0.120</td>
<td>0.0330</td>
<td>---</td>
<td>0.0092</td>
<td>0.120</td>
<td>0.0070</td>
<td>0.013</td>
<td>0.0050</td>
<td></td>
<td></td>
<td></td>
<td></td>
</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>
</tr>
</thead>
<tbody>
<tr>
<td>Primary MCL</td>
<td>0.05-0.2</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>0.100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary MCL</td>
<td>0.05-0.2</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>0.100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>0.024</td>
<td>1.4-2.5</td>
<td>0.12-0.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<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>0.00012</td>
<td>0.16-0.28</td>
<td>0.11-0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.074</td>
<td>0.0007</td>
<td>0.0014</td>
<td>0.0019</td>
<td>0.0080</td>
<td>0.0067</td>
<td>0.0053</td>
<td>0.0025</td>
<td>0.0013</td>
<td>0.0005</td>
<td>0.001</td>
<td>0.0019</td>
</tr>
</tbody>
</table>

mg/L = ppm
Table 2.4-2. Total recoverable metals in the reference water sample from the Pierce Ranger District, Clearwater National Forest. Numbers in bold-face type exceed one or more water quality standards.

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>Location</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>K8029903</td>
<td>Unnamed gulch, reference</td>
<td>0.01100</td>
<td>0.043</td>
<td>---</td>
<td>---</td>
<td>0.670</td>
<td>---</td>
<td>0.0110</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

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

mg/L = ppm

<table>
<thead>
<tr>
<th>WATER QUALITY STANDARDS</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>
</tr>
</thead>
<tbody>
<tr>
<td>Primary MCL</td>
<td>0.0500</td>
<td>2.000</td>
<td>0.005</td>
<td>0.100</td>
<td></td>
<td>0.0500</td>
<td></td>
<td></td>
<td>0.002</td>
<td>0.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary MCL</td>
<td>0.05-0.2</td>
<td></td>
<td></td>
<td>1.000</td>
<td>0.300</td>
<td>0.050</td>
<td></td>
<td>5.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic Life, Acute</td>
<td>0.750</td>
<td>0.3600</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></td>
<td></td>
</tr>
<tr>
<td>Aquatic Life, Chronic</td>
<td>0.087</td>
<td>0.1900</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></td>
<td>0.000012</td>
<td>0.16-0.28</td>
<td>0.11-0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.0007</td>
<td>0.002</td>
<td>0.003</td>
<td>0.0082</td>
<td>0.01</td>
<td>0.015</td>
<td>0.0025</td>
<td>0.0017</td>
<td>0.0005</td>
<td>0.013</td>
<td>0.0063</td>
<td></td>
</tr>
</tbody>
</table>
Table 2.5-1. Dissolved metals in water samples from the Pierce, North Fork, Lochsa, and Powell Ranger Districts, Clearwater National Forest. Numbers in bold-face type exceed one or more water quality standards.

<table>
<thead>
<tr>
<th>FIELD NO</th>
<th>Location</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>K8029903</td>
<td>Unnamed gulch, reference</td>
<td>0.120</td>
<td>0.030</td>
<td>0.0092</td>
<td>0.120</td>
<td>0.0070</td>
<td>0.013</td>
<td>0.0050</td>
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<tr>
<td>K8039901</td>
<td>Bond Mine (HM-165), Adit 1, water</td>
<td>0.085</td>
<td>0.0049</td>
<td>0.0120</td>
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<td>0.0043</td>
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<tr>
<td>K8039902</td>
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<td>0.077</td>
<td>0.0340</td>
<td>0.0110</td>
<td>0.0730</td>
<td>0.0094</td>
<td>0.015</td>
<td>0.0026</td>
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</tr>
<tr>
<td>K8039904</td>
<td>Red Cloud Mine (HM-180), Adit 2, water</td>
<td>0.130</td>
<td>0.0190</td>
<td>0.0075</td>
<td>0.0580</td>
<td>0.0079</td>
<td>0.0049</td>
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</tr>
<tr>
<td>K8259901</td>
<td>Smith Mine (HM-227), Adit 1, water</td>
<td>0.250</td>
<td>0.0400</td>
<td>0.5900</td>
<td>0.0770</td>
<td>0.011</td>
<td>0.0180</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>K8259902</td>
<td>Smith Mine (HM-227), upstream on Placer Creek</td>
<td>0.082</td>
<td>0.0370</td>
<td>0.1400</td>
<td>0.0140</td>
<td>0.0240</td>
<td>0.0100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K8259903</td>
<td>Smith Mine (HM-227), downstream on Placer Creek</td>
<td>0.091</td>
<td>0.0380</td>
<td>0.2700</td>
<td>0.0320</td>
<td>0.0140</td>
<td>0.0240</td>
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</tr>
<tr>
<td>K8369901</td>
<td>Little Papoose Prospect (HM-111), Adit 1, water</td>
<td>0.340</td>
<td>0.0055</td>
<td>0.0068</td>
<td>0.3800</td>
<td>0.0240</td>
<td>0.0100</td>
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</tr>
<tr>
<td>K9019902</td>
<td>Clearwater Gold and Copper Mine (HM-17), Adit 2, water</td>
<td>---</td>
<td>---</td>
<td>0.0250</td>
<td>0.0110</td>
<td>0.0096</td>
<td>0.0100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K9019903</td>
<td>Clearwater Gold and Copper Mine (HM-17), downstream on Niagara Gulch Creek</td>
<td>0.084</td>
<td>0.0110</td>
<td>0.0020</td>
<td>---</td>
<td>0.0110</td>
<td>0.0054</td>
<td>---</td>
<td>---</td>
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</tr>
<tr>
<td>K9019904</td>
<td>Clearwater Gold and Copper Mine (HM-17), upstream on Niagara Gulch Creek</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</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>
</tr>
</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>0.100</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Secondary MCL</td>
<td>0.05-0.2</td>
<td>2.000</td>
<td>0.005</td>
<td>0.100</td>
<td>0.050</td>
<td>0.002</td>
<td>0.100</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Aquatic Life, Acute</td>
<td>0.7(1)</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>
<td>0.12-0.21</td>
<td></td>
<td></td>
</tr>
<tr>
<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>0.00012</td>
<td>0.16-0.28</td>
<td>0.11-0.19</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.074</td>
<td>0.0007</td>
<td>0.0014</td>
<td>0.0019</td>
<td>0.0080</td>
<td>0.0067</td>
<td>0.0053</td>
<td>0.0025</td>
<td>0.0013</td>
<td>0.0005</td>
<td>0.001</td>
<td>0.0019</td>
</tr>
</tbody>
</table>
Table 2.5-2. Total recoverable metals in water samples from the Pierce, North Fork, Lochsa, and Powell Ranger Districts, Clearwater National Forest. Numbers in bold-face type exceed one or more water quality standards.

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>Location</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>K8039901</td>
<td>Bond Mine (HM-165), Adit 1, water</td>
<td>0.096000</td>
<td>0.006</td>
<td>---</td>
<td>---</td>
<td>0.045</td>
<td>---</td>
<td>0.0064</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>K8039902</td>
<td>Bond Mine (HM-165), downstream on Clearwater Gulch</td>
<td>0.01700</td>
<td>0.040</td>
<td>---</td>
<td>---</td>
<td>0.110</td>
<td>---</td>
<td>0.0079</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>K8039904</td>
<td>Red Cloud Mine (HM-180), Adit 2, water</td>
<td>0.03500</td>
<td>0.022</td>
<td>---</td>
<td>---</td>
<td>0.230</td>
<td>---</td>
<td>0.0100</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>K8259901</td>
<td>Smith Mine (HM-227), Adit 1, water</td>
<td>0.07000</td>
<td>0.037</td>
<td>---</td>
<td>---</td>
<td>5.100</td>
<td>---</td>
<td>0.1000</td>
<td>---</td>
<td>---</td>
<td>0.0120</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>K8259902</td>
<td>Smith Mine (HM-227), upstream on Placer Creek</td>
<td>0.00340</td>
<td>0.036</td>
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<td>---</td>
<td>0.220</td>
<td>---</td>
<td>0.0080</td>
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<td></td>
</tr>
<tr>
<td>K8259903</td>
<td>Smith Mine (HM-227), downstream on Placer Creek</td>
<td>0.00520</td>
<td>0.040</td>
<td>---</td>
<td>---</td>
<td>0.360</td>
<td>---</td>
<td>0.0270</td>
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</tr>
<tr>
<td>K8269901</td>
<td>Little Papoose Prospect (HM-111), Adit 1, water</td>
<td>0.06900</td>
<td>0.004</td>
<td>---</td>
<td>---</td>
<td>0.570</td>
<td>0.0025</td>
<td>0.0200</td>
<td>---</td>
<td>0.017</td>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>K9019902</td>
<td>Clearwater Gold and Copper Mine (HM-17), Adit 2, water</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.150</td>
<td>---</td>
<td>0.0090</td>
<td>---</td>
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</tr>
<tr>
<td>K9019903</td>
<td>Clearwater Gold and Copper Mine (HM-17), downstream on Niagara Gulch Creek</td>
<td>---</td>
<td>0.011</td>
<td>---</td>
<td>0.0085</td>
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<td>0.220</td>
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<td>0.0058</td>
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<td>0.014</td>
<td>0.0065</td>
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<tr>
<td>K9019904</td>
<td>Clearwater Gold and Copper Mine (HM-17), upstream on Niagara Gulch Creek</td>
<td>---</td>
<td>0.011</td>
<td>---</td>
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</table>

**EXPLANATION**
- Blank space equals no analysis
- mg/L = ppm
- 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>0.0500</td>
<td>2.000</td>
<td>0.005</td>
<td>0.100</td>
<td>1.000</td>
<td>0.050</td>
<td>0.002</td>
<td>0.10</td>
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<td></td>
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<tr>
<td>Secondary MCL</td>
<td>0.05-0.2</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>
<td>0.12-0.21</td>
<td>0.11-0.19</td>
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</tr>
<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>
<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>
<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>
<td>0.11-0.19</td>
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<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.0007</td>
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<td>0.003</td>
<td>0.0082</td>
<td>0.01</td>
<td>0.015</td>
<td>0.0025</td>
<td>0.0017</td>
<td>0.0005</td>
<td>0.013</td>
<td>0.0063</td>
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</table>
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.
Table 2.5-3. Element screen for dump samples from properties in the Pierce, North Fork, Lochsa, and Powell Ranger Districts, Clearwater National Forest.

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>Location</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>K8039903</td>
<td>Bond Mine (HM-165), mill tailings(?) at shaft</td>
<td>810</td>
<td>100.00</td>
<td>2.40</td>
<td>49.0</td>
<td>45.0</td>
<td>18,000</td>
<td>170.0</td>
<td>130</td>
<td>19.0</td>
<td>160</td>
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</tr>
<tr>
<td>K9019901</td>
<td>Clearwater Gold and Copper Mine (HM-17), Adit 1, dump</td>
<td>100</td>
<td>71.00</td>
<td>2.40</td>
<td>17.0</td>
<td>70.0</td>
<td>25,000</td>
<td>44.0</td>
<td>570</td>
<td>19.0</td>
<td>13</td>
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</tr>
<tr>
<td>K9019905</td>
<td>Clearwater Gold and Copper Mine (HM-17), Adit 2, dump</td>
<td>130</td>
<td>18.00</td>
<td>7.00</td>
<td>10.0</td>
<td>4,100.0</td>
<td>130,000</td>
<td>92.0</td>
<td>5,700</td>
<td>110.0</td>
<td>34</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clark Fork Superfund Background Levels (mg/Kg) = ppm</th>
<th>As</th>
<th>Cd</th>
<th>Pb</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Mean Soil</td>
<td>6.7</td>
<td>0.7</td>
<td>20.0</td>
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<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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</table>

Explanation
Below Detection Limit is ---
Not analyzed equals NA
Table 2.5-4. Toxicity Characteristic Leaching Procedure (TCLP) for dump samples from properties in the Pierce, North Fork, Lochsa, and Powell Ranger Districts, Clearwater National Forest.

<table>
<thead>
<tr>
<th>FIELD NO.</th>
<th>Location</th>
<th>As  (ppm)</th>
<th>Cd (ppm)</th>
<th>Cr  (ppm)</th>
<th>Pb  (ppm)</th>
<th>Hg (ppm)</th>
<th>Se (ppm)</th>
<th>Ag (ppm)</th>
<th>Ba (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K8039903</td>
<td>Bond Mine (HM-165), mill tailings(?) at shaft</td>
<td>---</td>
<td>0.025</td>
<td>0.085</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>1.600</td>
</tr>
<tr>
<td>K9019901</td>
<td>Clearwater Gold and Copper Mine (HM-17), Adit 1, dump</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>1.300</td>
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<tr>
<td>K9019905</td>
<td>Clearwater Gold and Copper Mine (HM-17), Adit 2, dump</td>
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<td>---</td>
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<td>---</td>
<td>0.900</td>
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</table>

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

**WATER QUALITY STANDARDS**

<table>
<thead>
<tr>
<th></th>
<th>As (mg/L)</th>
<th>Cd (mg/L)</th>
<th>Cr (mg/L)</th>
<th>Pb (mg/L)</th>
<th>Hg (mg/L)</th>
<th>Se (mg/L)</th>
<th>Ag (mg/L)</th>
<th>Ba (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary MCL</td>
<td>0.050</td>
<td>0.005</td>
<td>0.100</td>
<td>0.050</td>
<td>0.002</td>
<td>0.050</td>
<td>2.000</td>
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<tr>
<td>Secondary MCL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.100</td>
<td></td>
</tr>
<tr>
<td>Aquatic Life, Acute</td>
<td>0.360 - 0.004</td>
<td>0.009 - 1.7</td>
<td>3.1</td>
<td>0.082 - 0.2</td>
<td>0.002</td>
<td>0.0041 - 0.0134</td>
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</tr>
<tr>
<td>Aquatic Life, Chronic</td>
<td>0.190</td>
<td>0.001 - 0.002</td>
<td>0.21 - 0.37</td>
<td>0.003 - 0.008</td>
<td>0.000012</td>
<td>0.00012</td>
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</tr>
<tr>
<td>Estimated Detection Level (33% confidence)</td>
<td>0.49</td>
<td>0.02</td>
<td>0.03</td>
<td>0.300</td>
<td>0.01</td>
<td>0.650</td>
<td>0.270</td>
<td>0.050</td>
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</tbody>
</table>
3.0 MINE DESCRIPTIONS — CLEARWATER NATIONAL FOREST

PIERCE DISTRICT

3.1 OXFORD MINE (Site No. HM-122)

Alternate names—Silver Creek; J1C Group; Oxford Copper Mine; J.I.C.

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

The Oxford Mine is on a low ridge east of Copper Creek in the SW¼ of the NW¼ of the NW¼ of section 30, T. 38 N., R. 7 E., on the French Mtn. 7.5-minute quadrangle (Figure 3.1-1). Access from Pierce, Idaho, is northeast on FS Road 250 about 18 miles to FS Road 670, then northwest about 2 miles on Road 670 to FS Road 5054, and about ¼ mile west on FS Road 5054 to where Copper Creek flows into Elk Creek. A jeep road follows the east side of Copper Creek about ¼ mile north to the site. The mine is on Forest Service land adjacent to State land on the west.

3.1.2 Geologic Features (Figure 2.2-1b)

The deposit occurs in a silicified fracture zone in granodiorite. The ore consists of pyrrhotite, bornite, malachite, and chrysocolla in altered granitic rock (Shaffer, 1943; Kelly, 1946). Igneous rocks in the area include both the Cretaceous Idaho batholith and Tertiary granitic rocks (Rember and Bennett, 1979).

3.1.3 Site History

The Oxford Mine was located by John B. Collins around 1902. The Oxford Copper Mining Company, Ltd., was incorporated on April 10, 1907, with Collins as president and manager. In 1913, 25 feet of shaft was sunk during the year and the property had about 600 feet of total development. In 1921, development included a 140-foot shaft, 180 feet of tunnels, and 500 feet of total workings. By 1931, the shaft was caved and the main tunnel was 50-60 feet long. In 1939 and 1940, the mine camp was rebuilt and preparations were made to clean out the old shaft. This work continued the following year. In 1943, the property was briefly examined by the Bureau of Mines, but further involvement by the government was not recommended unless the company reopened the workings (Shaffer, 1943). Except for assessment work, there was no further activity on the property. The company charter was forfeited in November 1963.

3.1.4 Environmental Conditions

3.1.4.1 Site Features

The Oxford Mine was visited by John Kauffman on August 2, 1999. A video segment describing the site is on Clearwater National Forest Videotape (Tape 4, index 00:30:59-00:35:42). Documenting photograph is Roll K18, frame 2.
A caved shaft and one caved adit were found at the site (Figure 3.1-2). At the shaft, old timbers are visible in the caved debris (Figure 3.1-3). Metal pipe and bent steel rods and bolts are intermixed with the timbers. The caved soil and rock are about 8 feet below the top of the timbers. Above the timbers is an 8-foot high scarp, the top of which is at the level of the waste dump, indicating the shaft originally extended to that height. The waste dump is 75 feet long, 25 feet wide, and 15 feet thick. It is overgrown with a dense thicket of fir, spruce, and cedar trees. A bulldozer cut crosses the dump parallel to the long axis, extending from the access road to the level of the shaft timbers.

A lower road follows the bottom edge of the waste dump for the shaft. A small trough on the east side of the jeep road and a narrow waste dump across the road appear to be from a caved adit. The dump measures 40 feet long, 10 feet wide, and 4-8 feet thick. Anderson reported “several short tunnels” (1930, p. 32), but only the one was found.

The disturbed area at the site covers about 0.5 acre.

3.1.4.2 Sample Locations

3.1.4.2.1 Solid Samples
No solid samples were collected.

3.1.4.2.2 Water Samples
No water samples were collected.

3.1.5 Structures
No structures were found.

3.1.6 Safety

The shaft is caved and only about 8 feet deep. Collapsed timbers and other debris provide a means of escape.
Figure 3.1-1. Location of the Oxford Mine, Clearwater County, Idaho (U.S. Geological Survey French Mtn. 7.5-minute topographic map).
Figure 3.1-2. Sketch of the Oxford Mine.
Figure 3.1-3. View into the caved shaft at the Oxford Mine. Old timbers, metal pipe, rods, and bolts are visible in the caved debris (Roll K18, frame #2).
3.2 GOLD COIN MINE (Site No. HM-175)
Alternate name—Jewel Quartz.

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

The Gold Coin Mine is near the head of French Creek in the NW¼ of the SW¼ of section 34, T.37 N., R. 6 E., on the French Mtn. 7.5-minute quadrangle (Figure 3.2-1). Access from Pierce, Idaho, is northeast on FS Road 250 about 11 miles. A short access road splits from the west side of the road and leads down to the site, which is shown by a shaft symbol on the topographic map. The mine is on Forest Service land.

3.2.2 Geologic Features (Figure 2.2-1b)

This gold deposit is in a north-south trending quartz vein in granite (Staley, 1948). In the area surrounding the Gold Coin, granitic rocks of the Idaho batholith have intruded Precambrian Wallace Formation (Rember and Bennett, 1979).

3.2.3 Site History

In 1948, the property was owned by Bob Grey, of Clarkston, Washington. At that time, the property was called the Jewel Quartz. The workings consisted of a 100-foot shaft with 140 feet of drifting off the shaft. The ore was processed by a stamp mill (Staley, 1948). One ton of gold ore was shipped in 1940 (Zilka and others, 1987). The property is currently being worked by Dan and Mike Vaughan of Pierce, Idaho.

3.2.4 Environmental Conditions

3.2.4.1 Site Features

The Gold Coin Mine was visited by John Kauffman on August 8, 1999. A video segment describing the property is on Clearwater National Forest Videotape (Tape 4, index 00:35:47-00:39:34). Documenting photographs are Roll K18, frames 3-4.

A covered, locked shaft and a trench were the only workings found at the site (Figure 3.2-2). The shaft is covered with boards and a locked, steel plate, and is surrounded by a log fence (Figure 3.2-3). The shaft is reported to be 100 feet deep (Staley, 1948). Waste rock from the shaft has been bulldozed and incorporated into a large, leveled, and reseeded area along the drainage. This open flat measures at least 500 feet long and 100 feet wide (Figure 3.2-4). Old logs and a few boards are piled on the edge of the flat west of the shaft. Several fire rings indicate the site is used for camping. A shallow trough cut into the slope north of the shaft is either a prospect trench or a short, caved adit. The trough is about 25-30 feet long and 6 feet across. The disturbed and reclaimed area covers 2-3 acres.
3.2.4.2 Sample Locations

3.2.4.2.1 Solid Samples
   No solid samples were collected.

3.2.4.2.2 Water Samples
   No water samples were collected.

3.2.5 Structures

   The old boards on the edge of the reclaimed area may be the remnants of a cabin or shed. No other collapsed or intact structures were found.

3.2.6 Safety

   The shaft is surrounded by a sturdy log fence and is securely covered and locked. No other hazards were found.
Figure 3.2-1. Location of the Gold Coin Mine, Clearwater County, Idaho (U.S. Geological Survey French Mtn. 7.5-minute topographic map).
Figure 3.2-2. Sketch of the Gold Coin Mine.
Figure 3.2-3. Gold Coin shaft. The shaft is covered with boards and a steel plate; the plate is secured with a padlock. The covering is surrounded by a sturdy log fence (Roll K18, frame #4).

Figure 3.2-4. Open, reclaimed area around the Gold Coin shaft, looking south (Roll K18, frame #3).
3.3 UNNAMED PROSPECT (Site No. K8119901)

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

This prospect is on the east side of French Creek, across from Bluebell Gulch, in the NW¼ of the NW¼ of the NE¼ of section 34, T. 37 N., R. 6 E., on the French Mtn. 7.5-minute quadrangle (Figure 3.3-1). The prospect is at the lower edge of a clear-cut, about 30 feet in elevation above French Creek. Access from Pierce, Idaho, is on FS Road 250 northeast about 12 miles, then by foot from FS Road 250 across the creek to the site. The prospect is on Forest Service land.

3.3.2 Geologic Features (Figure 2.2-1b)

The prospect is near the contact zone of granitic rocks of the Idaho batholith and a roof pendant of metamorphosed Belt sediments.

3.3.3 Site History

Nothing is known about the history of this site.

3.3.4 Environmental Conditions

3.3.4.1 Site Features

This unnamed prospect was visited by John Kauffman on August 11, 1999. A video segment describing the site is on Clearwater National Forest Videotape (Tape 4, index 00:39:38-00:42:31). Documenting photographs are Roll K19, frames 10-11.

The prospect consists of an open adit and a small waste dump at the lower edge of a clear-cut along French Creek (Figure 3.3-2). Rock debris and slash from the clear-cut has slumped in front of the adit, leaving a narrow opening 4 feet long and 1½ feet high (Figure 3.3-3). The waste dump is 40 feet long, but only 10 feet wide and 6 feet thick (Figure 3.3-4). It does not reach the creek. The disturbed area covers less than 0.1 acre.

3.3.4.2 Sample Locations

3.3.4.2.1 Solid Samples

No solid samples were collected.

3.3.4.2.2 Water Samples

No water samples were collected.

3.3.5 Structures

No structures were found.
3.3.6 Safety

The adit opening is large enough to enter. The rock exposed at the opening is fractured and unstable, and it could easily collapse.
Figure 3.3-1. Location of the Unnamed Prospect, Site No. K8119901, Clearwater County, Idaho (U.S. Geological Survey French Mtn. 7.5-minute topographic map).
Figure 3.3-2. Sketch of Site No. K8119901.
Figure 3.3-3. Looking southeast toward the opening into the adit (center of picture) at Site No. K8119901. A pile of slumped rock and slash is in front of the opening (Roll K19, frame #10).

Figure 3.3-4. Looking east at the waste dump at Site No. K8119901. The lower edge of the clear-cut is at the left edge of the picture (Roll K19, frame #11).
3.4 FRENCH MOUNTAIN PROSPECT (Site No. K8029901)

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

The French Mountain Prospect is on the southeast flank of French Mountain in the SE¼ of the SE¼ of the SW¼ of section 33, T. 37 N., R. 6 E., on the Hemlock Butte 7.5-minute quadrangle (Figure 3.4-1). An adit symbol and a structure symbol are shown on the topographic map. A second adit symbol is shown about ¼ mile to the northwest on the French Mtn. 7.5-minute quadrangle, but nothing was found at that location. Access from Pierce, Idaho, is on FS Road 250 about 9 miles to FS Road 538 at French Saddle, then west on Road 538 about 1 mile to the site, which is in the low saddle dividing the head of French Creek from the head of Rosebud Creek. The prospect is on Forest Service land.

3.4.2 Geologic Features (Figure 2.2-1b)

The property is within a large roof pendant of schist and gneiss surrounded by granitic rocks of the Idaho batholith.

3.4.3 Site History

Nothing is known about the history of this site.

3.4.4 Environmental Conditions

3.4.4.1 Site Features

This prospect was visited by John Kauffman on August 2, 1999. A video segment describing the site is on Clearwater National Forest Videotape (Tape 4, index 00:42:36-00:47:41). Documenting photograph is Roll K18, frame 5.

A trough at least 50 feet long, which is probably a caved adit, extends up the slope from a small wooden shed or loading bay in thick brush on the slope south of FS Road 538 (Figure 3.4-2). Several brush-covered access roads on the slope are probably related to the adit. The wooden structure at the lower end of the trough appears to be under an old trestle extending out from the adit and on top of what presumably is the waste dump (Figure 3.4-3). The dump is very indistinct and overgrown. Pieces of scrap metal and a section of 8-inch-in-diameter steel pipe are scattered along the trough. The disturbed area covers less than 0.25 acre.

Another adit symbol is shown on the topographic map (French Mtn. 7.5-minute quadrangle) about ¼ mile to the northwest. No evidence of an adit or waste dump were found at this site. A spring flowing down the slope did not appear to come out of any workings, but a sample was collected for reference.
3.4.4.2 Sample Locations

3.4.4.2.1 Solid Samples
No solid samples were collected.

3.4.4.2.2 Water Samples

Water sample K8029903 was collected from the spring flowing at the site marked with an adit symbol on the topographic map, even though no evidence of an adit was found.

<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>K8029903</td>
<td>reference sample</td>
<td>17</td>
<td>---</td>
<td>7.18</td>
<td>2-3</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.4.4.2.3 Analytical Results

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

Sample K8029903 exceeded the Aquatic Life Chronic standard and was within the range of the Secondary MCL for aluminum in the dissolved metals screen. In the total recoverable metals screen, sample K8029903 exceeded the Secondary MCL for iron.

3.4.5 Structures

Although a cabin symbol (square box) is shown on the topographic map on the saddle above Site No. K8029901, nothing was found.

3.4.6 Safety
No safety hazards were found.
Figure 3.4-1. Location of the French Mountain Prospect, Site No. K8029901, Clearwater County, Idaho (U.S. Geological Survey Hemlock Butte and French Mtn. 7.5-minute topographic maps).
Figure 3.4-2. Sketch of the French Mountain Prospect.
Figure 3.4-3. Wooden shed or loading bay under the trestle for the rails from the adit at the French Mountain Prospect (Roll K18, frame #5).
3.5 LAST CHANCE #4 (Site No. K8029902)

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

This minor prospect is at the end of a short spur road off FS Road 538 on the south side of French Mountain, in the NW1/4 of the SW1/4 of the SW1/4 of section 33, T. 37 N., R. 6 E., on the French Mtn. 7.5-minute quadrangle (Figure 3.5-1). The site is about 1½ miles from FS Road 250 at French Saddle and is on Forest Service land adjacent to State land on the west.

3.5.2 Geologic Features (Figure 2.2-1b)

The property is within a large roof pendant of schist and gneiss surrounded by granitic rocks of the Idaho batholith.

3.5.3 Site History

Nothing is known about the history of this prospect.

3.5.4 Environmental Conditions

3.5.4.1 Site Features

The Last Chance #4 Prospect was visited by John Kauffman on August 2, 1999. No video or photographs were taken.

A recent trench has been dug across an old access road just below FS Road 538 (Figure 3.5-2). A seep of about 1 gallon per minute trickles out of the embankment and flows through the trench. Nearby, a claim notice posted on a tree identifies this as the “Last Chance #4” claim of Leroy Hartig, Pierce, Idaho. No waste rock was noted other than the material recently excavated from the trench. The disturbed area is minimal.

3.5.4.2 Sample Locations

3.5.4.2.1 Solid Samples

No solid samples were collected.

3.5.4.2.2 Water Samples

No water samples were collected

3.5.5 Structures

No structures were found.

3.5.6 Safety

No safety hazards were found.
Figure 3.5-1. Location of the Last Chance #4 Prospect, Clearwater County, Idaho (U.S. Geological Survey French Mtn. 7.5-minute topographic map).
Figure 3.5-2. Sketch of the Last Chance #4 Prospect.
3.6 BOND MINE (Site No. HM-165)
Alternate names—Dunn and Stowell; T-Bone #1 Claim; Sweet Mine; Crescent.

Note: There is some question as to whether this site is the Bond Mine. Local residents have indicated that the Bole Property of this report (section 3.8) is the old Bond Mine (Mike and Dan Vaughan, personal communication). It has also been suggested that the property discussed in this section is the Wild Rose Mine (Mike and Dan Vaughan, personal communication), although the Wild Rose, apparently on patented land, should be east of this location. Documents at the Cardiff Mansion in Pierce may clarify the property names.

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

The Bond Mine is along the south side of Clearwater Gulch in the SE¼ of the NE¼ of the SE¼ of section 6 and the SW¼ of section 5, T. 36 N., R. 6 E., on the Hemlock Butte 7.5-minute quadrangle (Figure 3.6-1). Access from Pierce, Idaho, is on FS Road 250 about 6 miles to FS Road 5160, then northwesterly on Road 5160 about 4½ miles to Clearwater Gulch. Where Road 5160 crosses the gulch, FS Road 5162, blocked by a ditch and berm, turns off to the east along the north side of the creek. Two adits are along the creek: the main adit on the south side about ½ mile east of Road 5160, and the second adit on the north side about ½ mile from Road 5160. A third site, probably a caved shaft, is to the southeast along an old logging road (probably FS Road 5160M) and about 400 feet in elevation higher than the main adit. All of the workings appear to be on Forest Service land, although a patented claim is near the site of the probable shaft.

3.6.2 Geologic Features (Figure 2.2-1b)

The vein at the Bond Mine strikes N. 45° E. and dips 40° NW. Mineralization consisted of a quartz vein with pyrite and arsenopyrite in mica schist and granite (Thomson and Ballard, 1924).

3.6.3 Site History

According to Thomson and Ballard (1924), the Bond Mine was the oldest quartz (lode) location in the district, and the mine was rumored to have produced $75,000 worth of ore.

Rhodes Creek Mining Company was incorporated June 29, 1925. The company was purchasing the mine from W. H. Stowell of Spokane, Washington. In 1925, the property had about 1,920 feet of development, including two tunnels (one about 400 feet long and the other caved), one 210-foot inclined shaft with three intermediate levels, three raises, and four drifts. A five-stamp mill had been left on the property by previous owners. Most of the workings were filled with water, but Rhodes Creek was making plans to rehabilitate the mine and reprocess the old dump. However, the company’s vice president, who had been doing most of the rehabilitation on the property, died in July 1926. The company forfeited its corporate charter in 1927.
The property was taken over by Stowell Gold Mining Company, which was incorporated in December 1926. The president of this company, W. H. Stowell, was the owner of the claims. In 1931, the property was leased to The American Exploration Company (incorporated in 1931), which again began rehabilitating the mine. Stowell lost the mine by mortgage foreclosure in 1932, and both Stowell Gold Mining and American Exploration forfeited their corporate charters that same year.

3.6.4 Environmental Conditions

3.6.4.1 Site Features

The Bond Mine was visited by John Kauffman on August 3, 1999. A video segment describing the property is on Clearwater National Forest Videotape (Tape 4, index 00:47:46-00:58:51). Documenting photographs are Roll K18, frames 6-13.

Two adits and a probable caved shaft were found at this site (Figure 3.6-2), although the second adit, Adit 2, may be associated with other claims or workings in the area, such as the unnamed prospect at Site No. K8129901 (see Section 3.55).

Adit 1 is on the south side of the creek at the end of a short access road. It is open, although the portal timbers have begun to collapse (Figures 3.6-3 and 3.6-4). A sign at the portal names this the T-Bone #1 claim. About 25 feet inside, the adit appears to be completely collapsed (Figure 3.6-5). A large pit on the slope above the adit was probably formed by the collapsed tunnel. A seep of 3 gallons per minute flows out of the adit and down the south side of the waste dump. A few wooden ties and trestle supports extend from the adit to the face of the dump (Figure 3.6-6). The dump measures 70 feet long, 60 feet wide, and 30 feet thick. It borders the edge of the creek, although little if any of the material extends into the water. The disturbed area covers less than 0.5 acre.

Adit 2 is about ¼ mile east of Adit 1 on the north side of the creek, not far east of where the access road crosses to the south side of the creek. The adit is caved and has a very minor seep. A long, narrow, and thin waste dump parallels the creek. The overgrown dump is about 150 feet long, 5-20 feet wide, but only 5 feet thick. It has been slightly eroded by the creek. A collapsed log cabin is near the portal, and one or two other collapsed cabins are west of the adit along the north side of the access road. The disturbed area covers less than 0.25 acres.

About ¼ mile southeast of Adit 1 and 400 feet higher in elevation is another large waste dump, probably from the inclined shaft reported to be part of the Bond workings. However, no pit or other evidence of the shaft’s location was found. An old logging road built over the top of the dump may have covered the shaft. The dump, overgrown with a dense stand of saplings (Figure 3.6-7) is 100 feet long, 40 feet wide, and 30 feet thick at the face. A small volume of water flows down a minor drainage along the north edge of the dump, but the waste rock is stable and shows no erosion. A flat area at the toe of the dump contains an abundance of metal, including parts of a
boiler or furnace, large cast-iron rings, thick steel or cast-iron plates, and miscellaneous rods, bars, and other scrap metal (Figures 3.6-8 and 3.6-9). Some of this material may be part of a small mill. Below this site is another flat area, about 20 feet by 20 feet square, that contains possible mill tailings. This material is mostly sand-sized, crushed granite or vein material with thin layers, some of which are oxidized (Figure 3.6-10). Although not well exposed, the material is estimated to be 5 feet thick. The disturbed area at this site covers about 0.5 acre.

3.6.4.2 Sample Locations

3.6.4.2.1 Solid Samples

Sample K8039903 was collected from the possible mill tailings at the shaft site.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K8039903</td>
<td>Bond Mine, possible mill tailings</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.6.4.2.2 Water Samples

Sample K8039901 was collected in front of Adit 1. Sample K8039902 was taken above FS Road 5160 on Clearwater Gulch Creek, downstream from Adit 1 about 1⁄4 mile. No upstream sample was taken.

<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>
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<td>K8039901</td>
<td>Bond Mine, Adit 1</td>
<td>114</td>
<td>45</td>
<td>7.4</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>K8039902</td>
<td>Bond Mine, downstream on Clearwater Gulch</td>
<td>54</td>
<td>53</td>
<td>7.72</td>
<td>3 ft. wide, 0.25 ft. deep</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.6.4.2.3 Analytical Results

Solid Samples

Sample K8039903, collected from the possible mill tailings at the Bond Mine, exceeds expected background and environmental levels for arsenic, cadmium, chromium, lead, and zinc in the element screen. Significant amounts of cadmium and chromium are leaching from the sample in the TCLP for metals test.
Water Samples

Sample K8039901 from Adit 1 at the Bond Mine is within the range of the Secondary MCL for aluminum and the Aquatic Life Chronic standard for copper in the dissolved metals screen. In the EPA Test 200.9 for arsenic, sample K8039901 exceeds the Primary MCL.

Sample K8039902, taken downstream from Adit 1 on Clearwater Gulch Creek, is within the range of the Secondary MCL for aluminum in the dissolved metals screen. In the total recoverable metals screen, sample K8039902 does not exceed any standards.

3.6.5 Structures

Collapsed log structures were found on the waste dump for Adit 2 and between Adits 1 and 2 along the north side of the access road. Nothing was found at the location of the structure symbol on the topographic map, although the site is well-suited for a cabin or living quarters. Aside from the scrap metal at the shaft site, no remains of the mill that produced the suspected tailings were evident.

3.6.6 Safety

Adit 1 is open, and the portal timbers are beginning to collapse. However, the adit appears to be totally caved 25 feet inside. The open portion has the potential to collapse and remains a minor hazard.
Figure 3.6-1. Location of the Bond Mine, Clearwater County, Idaho (U.S. Geological Survey Hemlock Butte 7.5-minute topographic map).
Figure 3.6-2. Sketch of the Bond Mine workings.
Figure 3.6-3. Looking southeast at the portal of Adit 1 at the Bond Mine (Roll K18, frame #6).

Figure 3.6-4. Close-up of the collapsing portal timbers of Adit 1 at the Bond Mine (Roll K18, frame #7).
Figure 3.6-5. View inside Adit 1 at the Bond Mine. Although somewhat difficult to see in this picture, caved rock and soil fills the adit about 25 feet inside. Several inches of water cover the adit floor (Roll K18, frame #8).
Figure 3.6-6. Looking southeast at the end of the waste dump for Adit 1 at the Bond Mine. A few posts from the trestle support protrude through the waste rock (Roll K18, frame #9).

Figure 3.6-7. Looking south at the overgrown waste dump for the shaft at the Bond Mine. The surface of the dump crosses the picture about 1 inch from the top (Roll K18, frame #11).
Figure 3.6-8. Large cast-iron rings and thick steel or cast-iron plates (far left) below the waste dump for the shaft at the Bond Mine. These may have been part of a mill. The base for a boiler or furnace is at the right side of the large tree in the center of the picture (Roll K18, frame #12).

Figure 3.6-9. Tipped-over boiler or furnace (just above the center of the picture) and its base (lower right) at the Bond Mine (Roll K18, frame #13).
Figure 3.6-10. Possible mill tailings below the waste dump for the shaft at the Bond Mine. Although blurry, the thin stratified layers, some with iron oxide coatings, can be seen. A quarter was used for scale (Roll K18, frame #10).
3.7 UNNAMED PROSPECT (Site No. K8129901)

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

This prospect is east of the Bond Mine workings on the south side of Clearwater Gulch, in the NE¼ of the SW¼ of section 5, T. 36 N., R. 6 E., on the Hemlock Butte 7.5-minute quadrangle (Figure 3.7-1). Access from Pierce, Idaho, is on FS Road 250 about 6 miles to FS Road 5160, then northwestward on Road 5160 about 4½ miles to Clearwater Gulch. Where Road 5160 crosses the gulch, FS Road 5162, blocked by a ditch and berm, turns off to the east along the north side of the creek. The prospect is slightly more than ½ mile east on Road 5162 and is 400 feet south of the road on a tributary gully to Clearwater Gulch. An old jeep road, partly overgrown and blocked by fallen trees, follows the gully past the prospect. The adit appears to be on a group of patented claims that are surrounded by Forest Service land. These claims may have been acquired by the Forest Service.

3.7.2 Geologic Features (Figure 2.2-1b)

The geology is probably similar to that of the Bond Mine.

3.7.3 Site History

Nothing is known about the history of this prospect, although it is very near the Bond Mine and may be associated with that property. It is also possible that it is associated with the Wild Rose Mine, although the workings of the Wild Rose that were described by Thomson and Ballard (1924) were not found.

3.7.4 Environmental Conditions

3.7.4.1 Site Features

The prospect was visited by John Kauffman on August 12, 1999. A video segment describing the site is on Clearwater National Forest Videotape (Tape 4, index 00:58:55-01:02:40). Documenting photographs are Roll K19, frames 18-19.

This prospect has a caved adit driven S. 20° E. into the slope (Figure 3.7-2). The trough formed by the caved adit is about 20 feet long and overgrown with ferns, small bushes, and hemlock saplings; several trees have fallen across the upper part of the trough (Figure 3.7-3). The waste dump is 60 feet long and 15-20 feet wide, with a maximum thickness of 15 feet. Near the adit, the dump thins to 2-3 feet thick. A large cedar tree is growing through the toe of the dump (Figure 3.7-4). The disturbed area covers less than 0.25 acre.

A large, open, flat area was found several hundred feet further to the south up the tributary gully from this adit. Although there is a cut along the embankment of an old, overgrown road, no adit
or obvious prospect was found. The old road was probably for logging access (possibly a continuation of FS Road 5160M). Construction of the road may have destroyed any old workings.

The block of patented claims was thought to be the Wild Rose property (Site No. HM-169), but no workings fitting the description given by Thomson and Ballard (1924) were found in the area. Only the one caved adit was found on the claims. If it is not related to the Wild Rose, it may be a prospect belonging to the Bond Mine.

3.7.4.2 Sample Locations

3.7.4.2.1 Solid Samples
No solid samples were collected.

3.7.4.2.2 Water Samples
No water samples were collected.

3.7.5 Structures
No structures were found.

3.7.6 Safety
No safety hazards were found.
Figure 3.7-1. Location of the Unnamed Prospect, Site No. K8129901, Clearwater County, Idaho (U.S. Geological Survey Hemlock Butte 7.5-minute topographic map).
Figure 3.7-2. Sketch of Site No. K8129901.
Figure 3.7-3. Looking southeast along the trough of the caved adit at Site No. K8129901. The shallow trough is overgrown with ferns, small bushes, and hemlock saplings (Roll K19, frame #18).
Figure 3.7-4. Looking southeast at the toe of the waste dump at Site No. K8129901. The large cedar tree growing through the dump is 18-20 inches in diameter (Roll K19, frame #19).
3.8 BOLE PROPERTY (Site No. HM-167)
Alternate name—Preacher Claims.

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

This property, now operated as the Preacher Claims, is probably on the old Bole property. The mine is along Clearwater Gulch and on the ridge between Clearwater Gulch and Preacher Creek, in the NE¼ of the SW¼ of section 6, T. 36 N., R. 6 E., on the Pierce 7.5-minute quadrangle (Figure 3.8-1). The property, about 1¼ to 2 miles due east of Pierce, can be reached via FS Road 538 along Rhodes Creek to FS Road 5162 at Clearwater Gulch, then east on Road 5162 about ½ mile. FS Road 5162 is blocked to vehicle access beyond Clearwater Gulch Campground. Alternative access is on FS Road 250 up Orofino Creek to FS Road 5160, then northwest on Road 5160 to its end on the ridge north of Clearwater Gulch. A jeep road goes west down the ridge crest from the end of Road 5160 to the main opening, a shaft. This is an active prospect on Forest Service land.

3.8.2 Geologic Features (Figure 2.2-1b)

Although the specific character of the Bole deposit is not known, other prospects in the area are characterized by pyrite and arsenopyrite in quartz veins that are in granite or granodiorite. The veins are often associated with diorite dikes.

3.8.3 Site History

The Bole Consolidated Mining Company was incorporated in 1922. In 1923, the property had three tunnels (620 feet, 150 feet, and 100 feet) and one 108-foot inclined shaft. Most of the company’s efforts were centered on placer operations, although 1923 work included cleaning out the tunnels. The company forfeited its corporate charter in 1925, but it was reinstated in September 1926. The company’s corporate charter was again forfeited in 1928.

3.8.4 Environmental Conditions

3.8.4.1 Site Features

The Bole Property was visited by John Kauffman on August 12, 1999. A video segment describing the property is on Clearwater National Forest Videotape (Tape 4, index 01:02:44-01:14:37). Documenting photographs are Roll K19, frames 12-17.

In the 1920s, the property had three tunnels and one shaft (Idaho Geological Survey mineral property files). Only a shaft, recently reopened, and one possible caved adit were found, along with several collapsed structures (Figure 3.8-2). The reopened shaft may not be the one that was worked in the 1920s. Thomson and Ballard (1924, p. 117) described a long tunnel and a 100-foot shaft, then stated “On the opposite or east side of Rhodes creek work has been done on a vein.”
This statement indicates the shaft was on the west side of Rhodes Creek. The shaft on the Preacher claims is on the east side of Rhodes Creek.

The shaft is on the crest of the ridge between Clearwater Gulch and Preacher Creek, in a deep notch cut into a saddle on the ridge. The present claim holder has rehabilitated the shaft and constructed a log-and-plywood frame above the opening (Figure 3.8-3). The shaft is covered with boards and plywood, which are secured with a chain and padlock (Figure 3.8-4). Electric cable, outlets, and light fixtures are attached to the frame. An old two-drum winch hoist and a pile of logs and lumber are in the notch south of the shaft (Figure 3.8-5). Material from the notch, and probably from the shaft, has been pushed out both the north and south ends of the cut, forming “dumps” about 20 feet long, 20 feet wide, and 15-20 feet thick. The disturbed area covers about 0.5 acre.

A small waste dump and a possible caved adit were found along FS Road 5162 (now an all-terrain-vehicle trail) on Clearwater Gulch. A short trough and a pile of rock measuring 30 feet long, 5-10 feet wide, and 5 feet thick borders the north side of the trail. A short distance west of the dump is a mineral survey marker (MS #3110, Dunn Millsite), dated 1986.

Several cuts were also found, but none had the appearance of being a caved adit.

3.8.4.2 Sample Locations

3.8.4.2.1 Solid Samples
   No solid were collected.

3.8.4.2.2 Water Samples
   No water samples were collected.

3.8.5 Structures

Two collapsed structures were found. One small, collapsed log shed or cabin is just west of the survey marker along Clearwater Gulch (Figure 3.8-6). A large collapsed building (Figure 3.8-7) is on the north edge of an open area on the ridge crest northwest of the possible adit. An old road leads to the open area from Clearwater Gulch. On the north slope of the ridge below the collapsed building are thousands of old tin cans, bottles (mostly broken), and other garbage (Figure 3.8-8). The only other structure found was a more recent outhouse at the shaft site.

3.8.6 Safety

The reopened shaft is covered and secured with a chain and lock. It would only be a hazard if left open.
Figure 3.8-1. Location of the Bole Property, Clearwater County, Idaho (U.S. Geological Survey Pierce 7.5-minute topographic map).
Figure 3.8-2. Sketch of the Bole Property.
Figure 3.8-3. Looking north at the frame constructed over the shaft at the Bole Property (Roll K19, frame #12).

Figure 3.8-4. Close-up of the cover over the shaft at the Bole Property. The hinged plywood is chained to the frame and locked. Electric wire, probably used with a generator, is wound around the cross support (Roll K19, frame #13).
Figure 3.8-5. Looking south from the shaft at the two-drum winch hoist and the pile of logs and lumber at the Bole Property (Roll K19, frame #14).

Figure 3.8-6. Collapsed small log structure along Clearwater Gulch. The trail up the gulch is in the background, crossing from the center right to the upper left of the picture (Roll K19, frame #17).
Figure 3.8-7. Large collapsed structure on the ridge top at the Bole Property. Some stove pipe and other scrap metal are in the collapsed debris (Roll K19, frame #16).
Figure 3.8-8. Looking north down the slope below the large collapsed structure at the Bole Property. Thousands of old tin cans, broken glass bottles, and other garbage extend at least 100 feet down the slope over a width of about 50 feet (Roll K19, frame #15).
3.9 RED CLOUD MINE (Site No. HM-180)

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

The Red Cloud Mine is on the ridge between Orofino Creek and Rosebud Creek, in the SE¼ of the SE¼ of section 9, T. 36 N., R. 6 E., on the Hemlock Butte 7.5-minute quadrangle (Figure 3.9-1). The location is accurately shown on the topographic map. Access from Pierce, Idaho, is on FS Road 250 about 5 miles east to FS Road 541, then about ¼ mile northeast on Road 541 to FS Road 5170, then north and east on Road 5170 about 1 mile to the junction with FS Road 5170C. The mine workings are along both Road 5170 and Road 5170C and are on Forest Service land.

3.9.2 Geologic Features (Figure 2.2-1b)

Rocks in the area consist of gneiss and schist that are part of a large roof pendant surrounded by granitic rocks of the Idaho batholith. The roof pendant is centered on French Mountain (Anderson, 1930).

3.9.3 Site History

Nothing is known of the history of this mine.

3.9.4 Environmental Conditions

3.9.4.1 Site Features

The Red Cloud Mine was visited by John Kauffman on August 3, 1999. A video segment describing the property is on Clearwater National Forest Videotape (Tape 4, index 01:14:41-01:27:31). Documenting photographs are Roll K18, frames 14-25.

The property consists of two main adits, one possible short caved adit, and pieces of equipment from a stamp mill (Figure 3.9-2), although neither the mill building nor any tailings were found.

Adit 1 is at the end of a spur road that turns off FS Road 5170 across from the junction with FS Road 5170C. The spur road runs parallel to and below Road 5150 for about ½ mile to the adit. The adit was driven northward into the slope. The hillside above the adit has slumped over the portal (Figure 3.9-3), leaving only a small opening with a few support timbers (Figure 3.9-4). Metal air pipe and a smaller water pipe extend out of the adit through the debris. A minor seep, less than 0.5 gallon per minute, forms a small boggy area in front of the adit on the access road. Square-cut timbers are along the access road west of the adit, and a collapsed cabin is at the end of the road east of the adit. Scrap metal, 55-gallon drums, sheet metal from a compressor, and other materials are scattered around the site (Figures 3.9-5 and 3.9-6). The waste dump is 65 feet long, 6-8 feet wide along most of its length, and 15-20 feet thick at the face, tapering to about 5 feet thick at the access road (Figure 3.9-7).
Adit 2 is on the north side of the ridge and was driven southeast into the hill. A short, old access road to the adit originates at FS Road 5170 and runs parallel to and about 30-40 feet above Road 5170C, which cuts the toe of the waste dump. This adit is completely caved and is expressed as a large, U-shaped scarp on the slope (Figure 3.9-8). It has a minor seep of less than 1 gallon per minute. The waste dump is 30 feet long, 25 feet wide, and 50 feet down the face, although it is not more than 15-20 feet thick perpendicular to the slope. Scrap rails and pipe have been left on the end of the dump (Figure 3.9-9).

Below Adit 2 and FS Road 5170C is a shallow trough on the slope that has the character of a caved adit or prospect trench. A small mound of material at the end of the trough may be waste rock. Slightly further down the hill from the trough are the remains of mill equipment scattered in the brush. These include the cam drives, mortar box, and stamps for a two-stamp mill (Figures 3.9-10 and 3.9-11), an old boiler (Figure 3.9-12), some unknown cast-iron ball and ring pieces (parts from a retort(?); Figure 3.9-13), and iron shafts and lifting devices that are nearby (Figure 3.9-14). It is not known if the mill ever operated; no mill building or tailings were found. The items are in an area overgrown with brush and trees that could obscure collapsed structures or small tailings impoundments.

The disturbed area (adits, trough, and junk equipment) covers about 1 acre.

3.9.4.2 Sample Locations

3.9.4.2.1 Solid Samples

No solid samples were collected.

3.9.4.2.2 Water Samples

Sample K8039904 was collected where the water from Adit 2 trickles over the face of the waste dump. Water quality measurements were taken closer to the caved adit.

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<th>pH</th>
<th>Flow (gpm)</th>
<th>Analyzed (Yes/No)</th>
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<td>50</td>
<td>7.38</td>
<td>&lt;1</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.9.4.2.3 Analytical Results

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

Sample K8039904 from the seep at Adit 2 of the Red Cloud Mine exceeds the Aquatic Life Chronic standard and is within the range of the Secondary MCL for aluminum in the dissolved metals screen. No standards are exceeded in the total recoverable metals screen.
3.9.5 Structures

The collapsed cabin at Adit 1 was the only structure found. Although stamp mill equipment was found below Adit 2, no remains of a building were evident.

3.9.6 Safety

The opening at Adit 1 is small but could be entered.
Figure 3.9-1. Location of the Red Cloud Mine, Clearwater County, Idaho (U.S. Geological Survey Hemlock Butte 7.5-minute topographic map).
Figure 3.9-2. Sketch of the Red Cloud Mine.
Figure 3.9-3. Slump on the slope above Adit 1 at the Red Cloud Mine, looking north. The opening into the adit is behind the tree stump (Roll K18, frame #14).
Figure 3.9-4. Close-up of the opening into Adit 1 at the Red Cloud Mine. An upright portal timber is in front of the opening. The large metal pipe was probably for air, and the small metal pipe below was most likely a water line (Roll K18, frame #15).

Figure 3.9-5. Looking east toward the end of the access road to Adit 1 at the Red Cloud Mine. The adit is to the left. A collapsed cabin is at the end of the road and several 55-gallon barrels are at the lower right. A Forest Service survey boundary marker is behind the log at the center left, although the National Forest map shows only Forest Service land in the area (Roll K18, frame #16).
Figure 3.9-6. Looking south across the surface of the waste dump for Adit 1 at the Red Cloud Mine. The sheet-metal top of a Sullair compressor is near the center of the picture (Roll K18, frame #17).

Figure 3.9-7. Looking southeast at the west side of waste dump for Adit 1 at the Red Cloud Mine (Roll K18, frame #18).
Figure 3.9-8. Looking southeast at the scarp around caved Adit 2 at the Red Cloud Mine (Roll K18, frame #19).

Figure 3.9-9. Scrap rails and pipe on the end of the waste dump for Adit 2 at the Red Cloud Mine. FS Road 5170C, about 30-40 feet below the dump, can be seen through the trees (curving across the upper center part of the picture) (Roll K18, frame #20).
Figure 3.9-10. Drive shaft and cams for the two-stamp mill at the Red Cloud Mine (Roll K18, frame #24).

Figure 3.9-11. Mortar box and stamps for the mill at the Red Cloud Mine (Roll K18, frame #23).
Figure 3.9-12. Old boiler nearly hidden in the brush at the Red Cloud Mine (Roll K18, frame #25).

Figure 3.9-13. Cast-iron rings and balls of an unknown device, possibly a retort, at the Red Cloud Mine (Roll K18, frame #21).
Figure 3.9-14. Iron shafts, hooks, and lifting devices near the other equipment at the Red Cloud Mine (Roll K18, frame #22).
3.10 PIONEER MINE (Site No. HM-198)
Alternate name—Free Gold.

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

The Pioneer Mine is on the slope west of Dutchman Creek near the center of the W½ of the E½ of the NE¼ of section 3, T. 35 N., R. 6 E., on the Hemlock Butte 7.5-minute quadrangle (Figure 3.10-1). The mine is labeled on the topographic map, but the workings are several hundred feet southeast of where the mine symbol is shown. It also appears to be shown too far to the east on the Clearwater National Forest map. Access from FS Road 100 is north on FS Road 540 about 2 miles to FS Road 535, then northeast on Road 535 about 4½ miles to FS Road 5021. Road 5021 turns south a short distance from Road 535, then bends back to the northeast around the nose of a ridge. About 200 feet before the bend, a jeep road turns off Road 5021 and also bends around the ridge. Once on the ridge crest, the main jeep road turns south and a barricaded road turns off to the northeast and more or less parallels Road 5021 for ½ mile to the mine. The property is on Forest Service land.

3.10.2 Geologic Features (Figure 2.2-1b)

The Pioneer Mine is in rocks of the Idaho batholith (Anderson, 1930). Zilka and others (1987, p. 18) summarized the geology as follows:
- Two parallel, 1- to 3-ft-wide quartz veins are 80 ft apart and exposed for 100 ft.
- Veins strike N. 70° E., and dip 85° S. in granitic country rock.

3.10.3 Site History

Staley (1940, p. 5) noted:
- On Dutchman Creek, in the Musselshell area, there is a 5-ton Gibson mill using amalgamation (Pioneer mine).

Nothing else is known about the property.

3.10.4 Environmental Conditions

3.10.4.1 Site Features

The Pioneer Mine was visited by John Kauffman on August 4, 1999. A video segment describing the property is on Clearwater National Forest Videotape (Tape 4, index 01:27:36-01:36:08). Documenting photographs are Roll K19, frames 1-7.

Two shafts were the only workings found at this property, along with an open grassy area and several small structures several hundred feet above the shafts (Figure 3.10-2). The open area, near the location of the mine symbol on the topographic map, is along the crest of a low ridge and
may have been the site of a small mill or camp for the property. The site appears to have been bulldozed level (Figure 3.10-3). A pole shelter roofed with sheet metal is near the southeast end of the area (Figure 3.10-4), and a small log storage shed is off the southwest side (Figure 3.10-5). Several piles of covered materials (buckets, cans, firewood, etc.) are near the shelter, and an outhouse is in the trees at the southeast end of the open area. The drainages on either side of the low ridge connect just below the site, and the shafts are on the southwest side of the drainage a few hundred feet further to the southeast.

Shaft 1 is open and filled with water about 15 feet below the surface. At the surface, the shaft is a conical opening about 20 feet across. A log-and-wire fence with “Danger” and “No Trespassing” signs surrounds the opening (Figure 3.10-6). About 10 feet below the surface of the ground, the shaft is cribbed with large, squared timbers forming a rectangular opening 8-10 feet long and 4 feet wide (Figure 3.10-7). The waste dump is 50 feet long, 20 feet wide, and 20 feet thick.

Shaft 2 is caved about 10 feet down and has a smaller-diameter pit than Shaft 1. A log-and-wire fence also surrounds this shaft (Figure 3.10-8), and an old, broken log ladder is propped against the side of the pit (3.10-9). A small mound of probable waste rock is on the northeast side of the pit, but no obvious waste dump was found.

On the north side of the waste dump for Shaft 1, the side of the gully appears to be slumped or, possibly, a cut was made into the bank. There may have been an adit at this location, but if there was, it is caved and the waste dump has been washed down the drainage. Parts of the creek may have been placered.

The disturbed area at the shafts covers about 0.5 acre, and the open camp site occupies about the same amount of area.

3.10.4.2 Sample Locations

3.10.4.2.1 Solid Samples
No solid samples were collected.

3.10.4.2.2 Water Samples
No water samples were collected.

3.10.5 Structures

The small storage shed, covered work shelter, and outhouse are the only structures found. Scrap metal and other debris are scattered around the site, particularly in the trees on the north side of the open area. A sink has been set up near the storage shed, and other camping materials have been left at the site.
3.10.6 Safety

Although surrounded by a fence and posted with warning signs, Shaft 1 is a hazard. The sides of the conical pit are steep and drop directly into the vertical cribbed walls of the shaft. The depth to the water from the top of the cribbing is about 8-10 feet.
Figure 3.10-1. Location of the Pioneer Mine, Clearwater County, Idaho (U.S. Geological Survey Hemlock Butte 7.5-minute topographic map).
Figure 3.10-2. Sketch of the Pioneer Mine.
Figure 3.10-3. Looking southeast along the open camp area at the Pioneer Mine. The leveled top of the low ridge is 150 feet long and 30 feet wide (Roll K19, frame #1).

Figure 3.10-4. Pole and sheet-metal-covered work shelter at the Pioneer Mine (Roll K19, frame #2).
Figure 3.10-5. Small log storage shed on the southwest side of the open camp site at the Pioneer Mine. A sink has been set up near the shed (lower right) (Roll K19, frame #3).

Figure 3.10-6. Fence and warning signs around Shaft 1 at the Pioneer Mine (Roll K19, frame #4).
Figure 3.10-7. View into Shaft 1 at the Pioneer Mine. The cribbing begins about 10 feet below the surface. Water fills the shaft to 8-10 feet below the top of the cribbing (Roll K19, frame #5).

Figure 3.10-8. Fence around Shaft 2 at the Pioneer Mine, looking northeast (Roll K19, frame #6).
Figure 3.10-9. View into caved Shaft 2 at the Pioneer Mine. An old, broken log ladder is leaning against the side of the pit (Roll K19, frame #7).
3.11 UNNAMED PLACER TUNNEL (Site No. K8269902)

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

This tunnel was visited and documented at the request of Mr. Vern Bretz of the U.S. Forest Service, Clearwater National Forest. It is on Musselshell Creek near the midpoint of the section line between section 32, T. 36 N., R. 6 E., and section 5, T. 35 N., R. 6 E., on the Hemlock Butte 7.5-minute quadrangle (Figure 3.11-1). Access from FS Road 100 is on FS Road 540 about 5½-6 miles to the junction with FS Road 5156. The tunnel was cut through a rock outcrop about 150 feet southwest of the junction of the roads. This junction appears to be in section 5, T. 35 N., R. 6 E., on the National Forest map, but the Hemlock Butte topographic map shows it in section 32, T. 36 N., R. 6 E. The creek now flows through the tunnel.

3.11.2 Geologic Features (Figure 2.2-1b)

This area is underlain by rocks of the Idaho batholith (Rember and Bennett, 1979).

3.11.3 Site History

Nothing is known about the history of this tunnel.

3.11.4 Environmental Conditions

3.11.4.1 Site Features

This site was visited by John Kauffman on August 26, 1999. A video segment describing the tunnel is on Clearwater National Forest Videotape (Tape 4, index 01:36:12-01:39:42). Documenting photographs are Roll K21, frames 6-8.

According to the Forest Service, this old tunnel was cut by placer miners working along Musselshell Creek. In addition to the tunnel, the creek bed appears to have been channeled for at least 50 feet to the northeast of the tunnel entrance (Figure 3.11-2). At the entrance, the tunnel is about 6-7 feet high, with a water depth of 1-2 feet (Figure 3.11-3). After a distance of about 150 feet, the water exits the tunnel. At the exit, the water level (at this time of year) was 6 inches below the roof, with an estimated depth of 5-6 feet (Figure 3.11-4). Other than the tunnel, there is no disturbance at this site.

3.11.4.2 Sample Locations

3.11.4.2.1 Solid Samples

No solid samples were collected.

3.11.4.2.2 Water Samples

No water samples were collected.
3.11.5 Structures
   No structures were found.

3.11.6 Safety

   The open tunnel is easily accessible from the road, although it is well hidden by roadside brush. However, worn foot paths to both the entrance and the exit indicate visitors are common, although probably not frequent. The water is relatively fast flowing and could easily knock someone off their feet, especially children. Near the exit, there is very little headroom, and in the spring and early summer, there is probably no headroom.
Figure 3.11-1. Location of the Unnamed Placer Tunnel, Site No. K8269902, Clearwater County, Idaho (U.S. Geological Survey Hemlock Butte 7.5-minute topographic map).
Figure 3.11-2. View upstream, to the northeast, of the channel cut along the creek at Site No. K8269902 (Roll K21, frame #7).
Figure 3.11-3. Entrance into the tunnel at Site No. K8269902, looking southwest. The opening is 6-7 feet high with 1-2 feet of water (Roll K21, frame #6).
Figure 3.11-4. Exit of the tunnel at Site No. K8269902. There is only about 6 inches of clearance above the water to the top of the tunnel. The water is estimated to be 5-6 feet deep (Roll K21, frame #8).
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3.12 ANN DEE PROSPECT (Site No. HM-51)

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

The Ann Dee Prospect is on Pollock Ridge in the NE¼ of the SE¼ of the SE¼ of section 35, T. 40 N., R. 11 E., on the Osier Ridge 7.5-minute quadrangle (Figure 3.12-1). Access from the old Kelly Creek Ranger Station, at the junction of Moose Creek and Kelly Creek, is on FS Road 255 north along Moose Creek about 2 miles to FS Trail 570/478, then northeast about 3 miles, staying on Trail 478 after it splits from Trail 570. The prospect is beside the trail in a low saddle on the ridge about 1 mile southwest of Pollock Hill and is on Forest Service land.

3.12.2 Geologic Features (Figure 2.2-1a)

Miller (1992, p. 39) described the geology as “White, vuggy, limonitic quartz vein, as thick as two ft, in calc-silicate country rock, poorly exposed.” A sample from the property contained no anomalous metals (Miller, 1992).

3.12.3 Site History

Nothing is known about the history of this prospect.

3.12.4 Environmental Conditions

3.12.4.1 Site Features

The Ann Dee Prospect was visited by John Kauffman on August 11, 1999. A video segment describing the prospect is on Clearwater National Forest Videotape (Tape 5, index 00:00:39-00:03:03). Documenting photographs are Roll K19, frames 8-9.

This is a minor prospect beside Trail 478 (Figure 3.12-2). It is identified as a caved shaft by Miller (1992). The pit, which is obscured by brush, is only 5-6 feet deep and 10 feet in diameter (Figure 3.12-3). A small pile of excavated rock is on the south rim of the pit (Figure 3.12-4). Quartz vein fragments are strewn around the pit, both on the waste rock pile and across the trail. No other workings are reported, and none were found. The disturbed area is minimal.

3.12.4.2 Sample Locations

3.12.4.2.1 Solid Samples

No solid samples were collected.

3.12.4.2.2 Water Samples

No water samples were collected.

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3.12.5 Structures
   No structures were found.

3.12.6 Safety

   Assuming this was a shaft, it is caved and the sides have sloughed in. What is left of the shaft presents no hazard. From the small amount of excavated material around the pit, it is doubtful it was deeper than 10-15 feet.
Figure 3.12-1. Location of the Ann Dee Prospect, Clearwater County, Idaho (U.S. Geological Survey Osier Ridge 7.5-minute topographic map).
Figure 3.12-2. Sketch of the Ann Dee Prospect.
Figure 3.12-3. Shallow, brushy pit at the Ann Dee Prospect (Roll K19, frame #8).

Figure 3.12-4. Small pile of excavated material around the pit at the Ann Dee Prospect. Pieces of vein quartz are scattered on the pile and around the pit (Roll K19, frame #9).
3.13 NEW RED LEAD PROSPECT (Site No. HM-95) and RED LEAD CLAIMS (Site No. HM-96)
Alternate name for New Red Lead Prospect—Doe Creek Prospect.

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

The New Red Lead Prospect is at the head of Doe Creek in the SW¼ of the NW¼ of section 4, T. 38 N., R. 13 E., on the Rhodes Peak 7.5-minute quadrangle (Figure 3.13-1). A pack trail follows the ridge north from Blacklead Mountain about 2 miles to the prospect. Blacklead Mountain can be reached either from Kelly Creek via FS Road 581 or from Powell on FS Road 569 to Papoose Saddle, then on FS Road 500 to FS Road 581, then about 7 miles to the turnoff to the mountain. The spur from Road 581 to the top of Blacklead Mountain is about 3/4 mile long and extremely rough; this jeep trail continues along the ridge about 1/2 mile and terminates in the saddle to the north of Blacklead Mountain. Driving time from Powell, a distance of 26-30 miles, is about 2½ hours. The property is on Forest Service land.

3.13.2 Geologic Features (Figure 2.2-1c)

Mineralization occurs along a steeply dipping, sheared, brecciated zone trending N. 70° E. The altered zone is at least 50 feet wide and extends along strike for about 500 feet. The zone is subparallel to boundary faults of the Rhodes Peak graben. Porphyritic dacite or andesite dikes occur near the portal, and granitic rocks occur nearby (Miller, 1992).

3.13.3 Site History

Miller (1992, p. 26) noted:

When U.S. Bureau of Mines personnel visited the prospect in 1990 or 1991, William and Kelly Cole were opening an old adit “with picks, shovels, a wheelbarrow, a portable conveyor belt system, and a small dragline-type slusher” (Miller, 1992, p. 26).

3.13.4 Environmental Conditions

3.13.4.1 Site Features

The New Red Lead Prospect was visited by John Kauffman on August 17, 1999. A video segment describing the site is on Clearwater National Forest Videotape (Tape 5, index 00:03:08-00:115:13). Documenting photographs are Roll K19, frames 21-25.

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An adit and three prospect pits are shown on Miller's (1992) map of the Blacklead Mountain vicinity (Figure 3.13-2). The adit and one pit were visited (Figure 3.13-3). No attempt was made to find the pit to the west, and the pit to the south was not found.

The adit is located on a steep, east-facing slope about 100 feet below the ridge top at an elevation of about 7,000 feet. Miller (1992) reported that the adit was being reopened. This has since been accomplished, although it did not appear that any work had been done within the past year or two. The adit has been retimbered through a slumping zone on the slope (Figure 3.13-4). A wheelbarrow, steel clamps, a roll of black PVC pipe, and other materials are stored near the entrance (Figure 3.13-5). A short distance inside, the adit appears to decline at about 10-15° (Figure 3.13-6). Large, square timbers are stacked on the front edge of the upper of two levels of waste rock, and smaller logs and beams are piled on the lower level (Figures 3.13-7 and 3.13-8). Some of the waste rock on the upper part of the dump was excavated more recently than the rest. A metal frame about 10-12 feet long near the dump may have been part of the portable conveyor belt system reported by Miller (1992). The disturbed area covers less than 0.25 acre.

Directly above the adit and a few feet below the ridge top is a shallow prospect pit and a small waste dump. The waste rock forms a very thin veneer 10-15 feet down the slope and 10 feet wide. Several more metal clamps and a small wood stove are on the ridge top near the pit. Old rotten logs near these materials may be the remains of the footings for a cabin.

The Red Lead Claims (Site No. HM-96), shown on Miller's (1992) map of the area (Figure 3.13-2), were visited on August 18, 1999. No video or photographs were taken. This site is in the NE¼ of the NW¼ of section 8, T. 38 N., R. 13 E. Two small prospect pits are noted on Table 2 of Miller's (1992) report. However, only one very minor pit, measuring 6 feet long, 3 feet wide, and 2 feet deep, was found in the vicinity. It seems unlikely that a pit this small would be noted, so other prospects may be in the area. The slope is extremely brushy and other prospects may be obscured.

3.13.4.2 Sample Locations

3.13.4.2.1 Solid Samples
No solid samples were collected.

3.13.4.2.2 Water Samples
No water samples were collected.

3.13.5 Structures

Only the possible foundation logs for a cabin were found on the ridge top above the adit and pit. Although arranged in a more or less rectangular pattern, these logs were severely rotted. If this was a cabin, no other parts of the structure remain.
3.13.6 Safety

The adit is open and can be entered. Inside, the adit appears to be completely timbered and lagged, indicating unstable rock conditions. Most of the timbers looked old and weathered, and some may be rotten.
Figure 3.13-1. Location of the New Red Lead and Red Lead Prospects, Clearwater County, Idaho (U.S. Geological Survey Rhodes Peak 7.5-minute topographic map).
Figure 3.13-2. Map of the Blacklead Mountain vicinity (Miller, 1992, Figure 5).
Figure 3.13-3. Sketch of the New Red Lead Prospect site.
Figure 3.13-4. Looking west at the portal of the New Red Lead Prospect (Roll K19, frame #21).
Figure 3.13-5. Close-up view of the portal of the New Red Lead adit. A wheelbarrow, metal clamps, and a roll of black PVC pipe are stored at the entrance (Roll K19, frame #22).
Figure 3.13-6. View inside the adit at the New Red Lead Prospect. Some of the timbers appear to be in poor condition. The floor appears to decline a short distance inside (Roll K19, frame #23).

Figure 3.13-7. Looking east at the stack of large, square timbers in front of the adit at the New Red Lead Prospect (Roll K19, frame #25).
Figure 3.13-8. Looking south at the two levels of waste rock for the adit at the New Red Lead Prospect. The stack of large, square timbers and the more recently excavated waste rock, probably from reopening the adit, are on the upper part; and a pile of smaller logs and timbers is on the lower part (Roll K19, frame #24).
3.14 BLACKLEAD PROSPECTS (Site Nos. HM-101 and HM-102)

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

The Blacklead Prospects include a series of workings located ½ to ¾ mile northeast of Blacklead Mountain in the SE¼ of section 8, the SW¼ of section 9, and the NW¼ of section 16, T. 38 N., R. 13 E., on the Rhodes Peak 7.5-minute quadrangle (Figure 3.14-1). Blacklead Mountain can be reached either from Kelly Creek via FS Road 581, or from Powell on FS Road 569 to Papoose Saddle, then on FS Road 500 to FS Road 581, and about 7 miles on FS Road 581 to the turnoff to Blacklead Mountain. The spur from Road 581 to the top of Blacklead Mountain is about ¾ mile long and extremely rough; this jeep trail continues along the ridge about ½ mile and terminates in the saddle to the north of Blacklead Mountain. Some of the workings are along FS Trail 508, and others are on the ridge above the trail; all are on Forest Service land.

3.14.2 Geologic Features (Figure 2.2-1c)

Granitic rocks, marble, and porphyritic volcanic rocks with sheared lenses of limonite, pyrite, and magnetite are found in the Blacklead Mountain area. The lenses of medium- to coarse-grained dolomitie marble are intercalated with the igneous rocks and are 200 feet thick in places. Some magnetite lenses are as much as 3 feet thick and 100 feet long. Copper carbonate staining is present locally (Miller, 1992). The marble is probably a metamorphosed Paleozoic limestone (Lewis and others, 1992a).

3.14.3 Site History

Miller described the history of the Blacklead Mountain area as follows (1992, p. 21):


3.14.4 Environmental Conditions

3.14.4.1 Site Features

The Blacklead Prospects were visited by John Kauffman on August 17, 1999. A video segment describing the prospects is on Clearwater National Forest Videotape (Tape 5, index 00:15:17-00:30:59). Documenting photographs are Roll K20, frames 1-15.
Six adits and numerous prospect pits are on top and on the east flank of the ridge dividing Silver Creek and the head of Deer Creek, ¼ to ¾ mile northeast of Blacklead Mountain (Figure 3.13-2). One pit, which is near the location marked by a shaft symbol on Miller’s (1992) map, is 6 feet in diameter and 5 feet deep; it may be a caved shaft. All of the other pits found are shallow and of little significance.

Adits 1 and 2 are on the steep northeast side of an eastern spur to the main northeast-trending ridge. Adit 1 is open and 20 feet long (Figure 3.14-2). Part of an old wooden wheelbarrow is just inside the adit on a pile of rock rubble (Figure 3.14-3). The small amount of waste rock forms a thin dump on the slope, measuring 6 feet long, 4 feet wide, and about 15 feet down the face (Figure 3.14-4). Adit 2, about 100 feet to the north of Adit 1 and 25 feet higher in elevation, is only 6 feet in length. The waste dump is 6 feet long, 4 feet wide, and 10 feet down the face. This dump is thinner on the slope than the dump for Adit 1.

Adit 3 and several prospect pits are about ¼ mile southeast of Adits 1 and 2. These workings are about 50-75 feet above Trail 508 and are on a magnetite vein or veins. The pits are shallow cuts into the slope (Figure 3.14-5) with small piles of coarse rock fragments on the slope below (Figure 3.14-6). The open adit is only 10 feet long (Figures 3.14-7 and 3.14-8). The excavated material again forms a thin veneer on the slope below the adit (Figure 3.14-9).

Caved Adit 4 is near the lower of two grave sites shown on the topographic map along Trail 508. A trough and scarp on the slope are on the north side of the trail (Figure 3.14-10). This adit is shown as a prospect pit on Miller’s (1992) map, but the size of the waste dump (40 feet long, 20 feet wide, and 10 feet thick; Figure 3.14-11) indicates it was an adit.

Two adit symbols are shown on the topographic map near the upper of the two grave sites. At the eastern of the two adit symbols, only a prospect cut and a small waste pile were found. The cut is about 10 feet long with no overhang (Figure 3.14-12). Part of the outcrop in the pit is stained with malachite, as are a few fragments on the small waste pile. Several other cuts are on the slope, both above and below this pit. A tobacco can on a nearby tree contained a claim notice from 1968, identifying this as the “Black Lead #3,” which was claimed by the Wilson Brothers.

Adit 5 is at the western of the two adit symbols shown on the topographic map. This adit is open and appears to be a decline parallel to the bedding (Figure 3.14-13). This may be the 40-foot-long opening mentioned in Miller (1992). Several large blocks from the outcrop have collapsed in front of the opening (Figure 3.14-14). The waste dump is 15 feet long, 10 feet wide, and 10 feet thick. It extends down almost to Trail 508 (Figure 3.14-15).

One other minor prospect has a small opening but is only 3 feet long (Figure 3.14-16). This short opening is at the corner of a switchback on Trail 508, about 50 feet below the ridge top west of Adit 5.

The total disturbed area for the adits covers about 1 acre. Individual sites cover less than 0.25 acre. The majority of the prospect cuts are in an area about 2,000 feet long and 500-700 feet wide, although the actual disturbed area is minimal.
3.14.4.2 Sample Locations

3.14.4.2.1 Solid Samples
   No solid samples were collected.

3.14.4.2.2 Water Samples
   No water samples were collected.

3.14.5 Structures
   No structures were found.

3.14.6 Safety

Of the open adits, Adit 5 constitutes the most significant hazard because of its proximity to Trail 508 and its probable greater length than the other workings. Adits 1 and 2, on the steep northeast face of the ridge, are not likely to be found by most visitors to the area. Adit 3, although open, is very short and only a minor hazard.
Figure 3.14-1. Location of the Blacklead Prospects, Clearwater County, Idaho (U.S. Geological Survey Rhodes Peak 7.5-minute topographic map).
Figure 3.14-2. Looking west-southwest at Adit 1 at the Blacklead Prospects (Roll K20, frame #1).
Figure 3.14-3  View inside Adit 1 at the Blacklead Prospects. Part of an old wooden wheelbarrow is in the foreground on a large pile of rock rubble. The end of the adit is just behind the pile (Roll K20, frame #2).

Figure 3.14-4. Looking east down the face of the waste dump for Adit 1 at the Blacklead Prospects (Roll K20, frame #3).
Figure 3.14-5. Looking northeast at one of the pits near Adit 3 at the Blacklead Prospects. Brush and saplings cover most of the pit (Roll K20, frame #5).
Figure 3.14-6. Pile of coarse magnetite fragments below the pit shown in Figure 3.14-5 (Roll K20, frame #4).

Figure 3.14-7. Small opening at Adit 3 at the Blacklead Prospects, looking west (Roll K20, frame #6).
Figure 3.14-8. View inside Adit 3 at the Blacklead Prospects. The adit is only 10 feet long and about 3-4 feet high (Roll K20, frame #7).

Figure 3.14-9. Thin veneer of waste rock on the slope below Adit 3 at the Blacklead Prospects, looking northeast. Trail 508 is barely noticeable beside the snag at the upper left (Roll K20, frame #8).
Figure 3.14-10. Trough and scarp at caved Adit 4 at the Blacklead Prospects, looking north (Roll K20, frame #10).
Figure 3.14-11. Looking east at the side of the waste dump for Adit 4 at the Blacklead Prospects (Roll K20, frame #9).
Figure 3.14-12. Copper staining on the face of a prospect cut at the Blacklead Prospects, looking north. This site is marked by an adit symbol on the topographic map but is only a notch cut into the slope (Roll K20, frame #11).
Figure 3.14-13. Opening of Adit 5 at the Blacklead Prospects. This appears to be a decline parallel to the bedding of the carbonate rocks, and it may be the 40-foot-long adit mentioned by Miller (1992), although he does not identify the location of the adit (Roll K20, frame #12).
Figure 3.14-14. Looking northwest at the large blocks that have fallen in front of the opening of Adit 5 at the Blacklead Prospects (Roll K20, frame #14).
Figure 3.14-15. Looking southwest at the waste dump for Adit 5 at the Blacklead Prospects. Sections of Trail 508 can be seen above and to the right of the dump (Roll K20, frame #13).
Figure 3.14-16. Small prospect along Trail 508 at the Blacklead Prospects, about 50 feet below the ridge top. The opening is only 3 feet long and 2.5-3 feet high inside (Roll K20, frame #15).
3.15 E AND R TOUGHLUCK PROSPECT (Site No. HM-103)

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

Workings of the E and R Toughluck Prospect are on the crest and north flank of the ridge extending southeast from Blacklead Mountain, in the NW¼ of the SW¼ of section 16, T. 38 N., R. 13 E., on the Rhodes Peak 7.5-minute quadrangle (Figure 3.15-1). The workings are about ¾ mile to the southeast of Blacklead Mountain by foot (Figure 3.13-2). All the workings are on Forest Service land.

3.15.2 Geologic Features (Figure 2.2-1c)

This prospect is near the faulted contact of granitic rocks and quartzitic metasedimentary rocks in the Rhodes Peak graben. Narrow mineralized veins occur along limonitic shear zones (Miller, 1992).

3.15.3 Site History

The E and R Toughluck claim was located by Ronald D. Hartig and Edward C. Ogden, Jr., in 1984. Older workings included a caved shaft, small trenches, and pits. A short adit had been driven by Hartig and Ogden when the property was examined in 1990 or 1991 (Miller, 1992). Apparently only assessment work has been done since that time, as the adit has not had any additional development.

3.15.4 Environmental Conditions

3.15.4.1 Site Features

The E and R Toughluck Prospect was visited by John Kauffman on August 18, 1999. A video segment describing the workings is on Clearwater National Forest Videotape (Tape 5, index 00:31:04-00:35:43). Documenting photographs are Roll K20, frames 16-20.

Several shallow pits, a caved shaft, and a short adit were found at this prospect (Figure 3.15-2). The pits and shaft are on the ridge top at elevations of 6,550 to 6,700 feet, and the adit is on the steep, northeast-facing slope at an elevation of about 6,300 feet.

The caved shaft, which is a few feet south of the crest of the ridge, forms a pit about 10 feet in diameter and 8 feet deep. Old cribbing is visible in the bottom of the pit (Figure 3.15-3). Material excavated from the shaft forms a crescent-shaped dump around the south rim of the pit. The dump measures 20 feet long, 6 feet wide, and 7 feet thick (Figure 3.15-4). Adjacent to the east side of the shaft is another pit about 10 feet in diameter and 5 feet deep. The excavated material from this pit forms a waste pile 10 feet long, 6 feet wide, and 5 feet thick. Another small, shallow pit, 5 feet in diameter and 3 feet deep, is about 150 feet further to the east. A third shallow pit is 200 feet west of the shaft. The disturbed area at these workings covers about 0.25 acre.
The adit is on the steep northeast slope overlooking Billy Rhodes Creek. Beginning as a notch about 20 feet long cut into the outcrop (Figure 3.15-5), the adit continues underground for only 6-8 feet (Figure 3.15-6). Hose and several 2-inch-square boards are stored inside. The waste dump is 20 feet long, 6 feet wide, and 7 feet thick (Figure 3.15-7). Some of the rock continues down the steep slope for 30-50 feet. Little work appears to have been done at this adit since 1990 when it was visited by the U.S. Bureau of Mines (Miller, 1992). The disturbed area is less than 0.1 acre.

3.15.4.2 Sample Locations

3.15.4.2.1 Solid Samples
   No solid samples were collected.

3.15.4.2.2 Water Samples
   No water samples were collected.

3.15.5 Structures
   No structures were found.

3.15.6 Safety

The shaft is caved and is not a hazard. The adit is open but very short, and it is on a steep slope with no visible trail to the site. Frequent visitors to the adit are unlikely.
Figure 3.15-1. Location of the E and R Toughluck Prospect, Clearwater County, Idaho (U.S. Geological Survey Rhodes Peak 7.5-minute topographic map).
Figure 3.15-2. Sketch of the E and R Toughluck Prospect.
Figure 3.15-3. Pit of the caved shaft at the E and R Toughluck Prospect. Several old timbers are in the bottom of the pit (Roll K20, frame #16).

Figure 3.15-4. Looking southeast at the caved shaft at the E and R Toughluck Prospect. A pit has been excavated adjacent to the far side of the shaft. The crest of the ridge is off the left edge of the picture (Roll K20, frame #17).
Figure 3.15-5. Looking southwest at the notch cut into the outcrop in front of the adit at the E and R Toughluck Prospect (Roll K20, frame #18).
Figure 3.15-6. View inside the adit at the E and R Toughluck Prospect. The opening is only 6-8 feet long (Roll K20, frame #20).
Figure 3.15-7. Looking northeast at the waste dump for the adit at the E and R Toughluck Prospect. This dump is above the Billy Rhodes Creek drainage (Roll K20, frame #19).
3.16 SOUTHEAST BLACKLEAD PROSPECT (Site No. HM-108)

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

The Southeast Blacklead Prospect is about 1 mile southeast of Blacklead Mountain in the NE¼ of the NE¼, section 20 (unsurveyed), T. 38 N., R. 13 E., on the Rhodes Peak 7.5-minute quadrangle; several prospects extend south onto the Cayuse Junction 7.5-minute quadrangle (Figure 3.16-1). Access to Blacklead Mountain is the same as for the previous sites. From the jeep road to Blacklead Mountain, a foot path heads south from the saddle south of Blacklead Mountain, goes over Knoll 7281, then turns southeast. Near the prospect, the trail was not obvious. The workings are all on Forest Service land.

3.16.2 Geologic Features (Figure 2.2-1c)

The workings at this prospect are along a sheared contact zone between granite and quartzite with interbedded marble. Tactites in the marble contain magnetite, pyrite, chalcopyrite(?), garnet, diopside, and epidote. The lenticular pods of tactite are 10-20 feet thick. The mineralized zone can be traced for at least 1,400 feet (Miller, 1992).

3.16.3 Site History

Miller (1992) speculated that the history of this site probably dates back to the early days of prospecting in the Blacklead Mountain area (see section 3.14.3).

3.16.4 Environmental Conditions

3.16.4.1 Site Features

The Southeast Blacklead Prospect was visited by John Kauffman on August 18, 1999. A video segment describing the site is on Clearwater National Forest Videotape (Tape 5, index 00:35:48-00:38:06). Documenting photographs are Roll K20, frames 21-22.

Miller (1992) mapped an adit and five prospects (Figure 3.16-2). Only the caved adit and two of the prospect pits, one along the north edge of the ridge crest and the other about 200 feet to the south, were found. Both prospect pits are on a skarn zone at the marble-granite contact. These are both small, shallow pits of little significance. However, they do define the contact zone.

The caved adit is on the northeast side of the ridge about 100 feet below the crest (Figure 3.16-3). The adit was driven into an outcrop of skarn at the marble-granite contact and has a headwall scarp above a shallow trough. The waste dump measures 20 feet long, 12 feet wide, and 20 feet thick (Figure 3.16-4). The disturbed area covers about 0.25 acre.
3.16.4.2 Sample Locations

3.16.4.2.1 Solid Samples
   No solid samples were collected.

3.16.4.2.2 Water Samples
   No water samples were collected.

3.16.5 Structures
   No structures were found.

3.16.6 Safety
   No safety hazards were found.
Figure 3.16-1. Location of the Southeast Blacklead Prospect, Clearwater County, Idaho (U.S. Geological Survey Rhodes Peak and Cayuse Junction 7.5-minute topographic maps).
Figure 3.16-2. Map of the Southeast Blacklead Prospect (Miller, 1992, Figure 11).
Figure 3.16-3. Looking southwest at the trough and headwall scarp of the caved adit at the Southeast Blacklead Prospect (Roll K20, frame #21).
Figure 3.16-4. Looking north at the waste dump for the adit at the Southeast Blacklead Prospect. Blacklead Mountain is on the skyline at the upper left (Roll K20, frame #22).
3.17 LITTLE PAPOOSE PROSPECT (Site No. HM-111)
Alternate name—Papoose.

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

The Little Papoose Prospect is at the head of the west branch of the East Fork of Papoose Creek. The exact locations of the workings are uncertain because the roads shown on the Forest Service engineering maps do not match the existing roads. One adit is in the SE¼ of the SW¼ of section 6 (unsurveyed), and a second is in either the same one-sixteenth section or is in the NE¼ of the NW¼ of section 7 (unsurveyed), T. 37 N., R. 14 E., on the Rocky Point 7.5-minute quadrangle (Figure 3.17-1). Access from U.S. Highway 12 is north on FS Road 568 along Papoose Creek about 5½ miles to FS Road 568A, then north on Road 568A to gated FS Road 568B, a distance of about 2 miles. The main adit is at the end of a road that branches off Road 568B on the west side of the drainage. The second adit is on the east side of the drainage about 200 feet lower in elevation and ¼ mile to the south. An old logging road cuts the toe of the waste dump for the second adit. A third adit (which was shown on an old map in the U.S. Forest Service files) was not found, although a possible waste dump, noted from across the drainage, may be near the bottom of the drainage not far to the south of the second adit. The workings are on Forest Service land.

3.17.2 Geologic Features (Figure 2.2-1c)

The deposit is hosted in rocks of the Wallace Formation near the Papoose Saddle fault (Lewis and others, 1992b). Quartz veins contain stibnite and tetrahedrite, and the mineralization is best developed at the intersections between north-northeast- and northwest-trending veins. Disseminated mineralization also occurs in brecciated units of the Wallace Formation (Miller, 1992). Springer (1961) mapped the mineralization as occurring along an unconformable contact between thin-bedded, light gray to tan quartzite and metamorphosed limestone.

3.17.3 Site History

In 1961, the property was owned by Mr. Otto Weigand of Stevensville, Montana, and Mr. Thomas Larson of Missoula, Montana. Sunshine Mining Company was contemplating an agreement with the owners. The workings included a trench and a pit (Springer, 1961).

Miller (1992, p. 26) reported the “current claims were located between 1967 and 1969 by Lois W. Larson.”

When the site was visited for this project, numerous recent drill sites were found in the area. (According to Forest Service personnel, the drilling took place in July 1999.) Although current ownership was not investigated, the area is being actively prospected, and the Forest Service is aware of the activity.
3.17.4 Environmental Conditions

3.17.4.1 Site Features

The Little Papoose Prospect was visited by John Kauffman on August 26, 1999. A video segment describing the workings is on Clearwater National Forest Videotape (Tape 5, index 00:38:10-00:46:22). Documenting photographs are Roll K21, frames 4-5.

An exploration drilling program was underway at this prospect during the summer of 1999, and the portal of the main adit had recently been reopened. Several of the drill sites and two adits were found. The main adit is on the west side of the drainage, and a second is on the east side (Figure 3.17-2).

Adit 1, recently reopened, has plywood doors hinged to the timbered portal, although there is a wide gap underneath the doors (Figure 3.17-3). A minor seep trickles from the adit. A wide flat area in front of the portal has at least two exploration drill-hole sites. The waste dump is 50 feet long, 20 feet wide, and 25 feet thick, although it has been modified to some extent by construction of the drill sites. This adit is at the end of a spur of Road 568B (or, at least, it is assumed to be a spur). Roads on the Forest Service topographic map do not exactly match what was found. The disturbed area covers about 0.5 acre.

The main access road (Road 568B(?)) continues around to the east side of the drainage and crosses above Adit 2. A logging road, which apparently originates to the south, passes below the adit and cuts the toe of the waste dump (Figure 3.17-4). This adit is caved and hidden in thick brush. A minor seep forms a bog in the thicket. At least six 55-gallon drums, some of which may still contain petroleum products, are near the caved adit. The waste dump measures 50 feet long, 5-15 feet wide on top, and 20-30 feet thick. The disturbed area covers less than 0.25 acre.

A third adit is shown on an old map of the prospect (USFS mineral property files, Clearwater National Forest), although this tunnel was not found. A possible small waste dump, below and south of Adit 2, was noted from the west side of the drainage. The location is documented on the video segment.

In addition to these workings, several other exploration holes were drilled in the area. The combined disturbed area for these sites is about 1 acre, although most were drilled near or on existing logging roads.

3.17.4.2 Sample Locations

3.17.4.2.1 Solid Samples
No solid samples were collected.
3.17.4.2.2 Water Samples

Sample K8269901 was collected immediately in front of the portal for Adit 1.

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<td>&lt;0.25</td>
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</tbody>
</table>

3.17.4.2.3 Analytical Results

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

Sample K8269901 from Adit 1 at the Little Papoose Prospect exceeds the Secondary MCLs for aluminum and iron and the Aquatic Life Chronic standard for aluminum in the dissolved metals screen. In the total recoverable metals screen, sample K8269901 exceeds the Secondary MCL for iron. In the EPA Test 200.9 for arsenic, the sample exceeds the Primary MCL.

3.17.5 Structures

No structures were found.

3.17.6 Safety

Adit 1 has been reopened. It is gated and locked, although a wide gap under the door provides adequate crawl space to enter the workings. The access road is closed by a locked gate at FS Road 568A, a distance of about ½ mile from the adit.
Figure 3.17-1. Location of the Little Papoose Prospect, Idaho County, Idaho (U.S. Geological Survey Rocky Point and Cayuse Junction 7.5-minute topographic maps).
Figure 3.17-2. Sketch of the Little Papoose Prospect workings.
Figure 3.17-3. Looking northwest at the gated portal of Adit 1 at the Little Papoose Prospect (Roll K21, frame #4).

Figure 3.17-4. Looking southeast at the face of the waste dump for Adit 2 at the Little Papoose Prospect. An old logging road cuts across the toe of the dump (Roll K21, frame #5).
3.18 CHITWOOD MINE (Site No. HM-228)

3.18.1 Site Location and Access (Figure 2.1-b)

Prospects of the Chitwood Mine are in the NW¼ of section 17 and the NE¼ of section 18, T. 33 N., R. 7 E., on the Lowell 7.5-minute quadrangle (Figure 3.18-1). Access from U.S. Highway 12 is north on FS Road 101 about 14 miles to Fan Creek Saddle, southeast on FS Road 486 about 2 miles to FS Road 5525, south on Road 5525 about 1¾ miles to FS Road 460, and ¼ mile on Road 460 to barricaded FS Road 460B. Road 460B heads south, turns northeast around the head of a branch of Placer Creek, then heads back to the south and southeast about 2 miles to the mine. The prospect is on Forest Service land.

3.18.2 Geologic Features (Figure 2.2-1b)

The Chitwood Mine is underlain by quartzite, schist, and calc-silicate rocks belonging to the Middle or Early Proterozoic Syringa metamorphic sequence. These rocks are intruded by rhyolite dikes, and Cretaceous intrusive rocks are found nearby (Lewis and others, 1992b).

3.18.3 Site History

Nothing was found about the history of this prospect.

3.18.4 Environmental Conditions

3.18.4.1 Site Features

The Chitwood Mine was visited by John Kauffman, accompanied by Mr. Vern Bretz of the U.S. Forest Service, on August 25, 1999. A video segment describing the site is on Clearwater National Forest Videotape (Tape 5, index 00:46:27-00:49:15). Documenting photographs are Roll K20, frames 23-24.

A cabin and a pond are shown on the topographic map at this site. Only one possible caved adit was found. This possible adit consists of a short trough beside the trail that continues down the ridge from the cabin. No waste dump, other than a small wide spot in the trail, was noted. All the other workings are bulldozer cuts, trenches, or placers along the gullies. Many of the placers were apparently worked using water brought around the hillside in a ditch from the pond at the cabin site, although the pond is currently drained and dry. The disturbed areas, which are mostly overgrown with brush and small trees, are either at the scattered trenches or the cabin site. The original disturbed area probably covered several acres.

3.18.4.2 Sample Locations

3.18.4.2.1 Solid Samples

No solid samples were collected.
3.18.4.2.2 Water Samples
   No water samples were collected.

3.18.5 Structures

An old cabin and several sheds are at the site noted on the topographic map. All are in disrepair, although the cabin is intact (Figure 3.18-2). There is also a wooden bridge across the small drainage near the cabin (Figure 3.18-3).

3.18.6 Safety
   No safety hazards were found.
Figure 3.18-1. Location of the Chitwood Mine, Idaho County, Idaho (U.S. Geological Survey Lowell 7.5-minute topographic map).
Figure 3.18-2. Old log cabin and shed at the Chitwood Mine, looking northwest (Roll K20, frame #23).

Figure 3.18-3. Another view of the cabin and shed at the Chitwood Mine, with the wooden bridge in the foreground. A second shed in poor condition is in the trees to the right of the cabin (Roll K20, frame #24).
3.19 SMITH MINE (Site No. HM-227)
Alternate name—Selway.

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

The Smith Mine is near the head of Placer Creek in the south-central part of the N¼ of section 7, T. 33 N., R. 7 E., on the Syringa 7.5-minute quadrangle (Figure 3.19-1). The main adit is in the SE¼ of the SE¼ of the NW¼ of section 7. Access from U.S. Highway 12 is north on FS Road 101 about 14 miles to Fan Creek Saddle, southeast on FS Road 486 about 2 miles to FS Road 5525, south on Road 5525 about 1¼ miles to FS Road 460, and ¼ mile on Road 460 to barricaded FS Road 460B. Road 460B heads south, then turns northeast around the head of a branch of Placer Creek. The main Smith adit is on the west side of the drainage where the road crosses the creek and turns back to the south. The property is on Forest Service land.

3.19.2 Geologic Features (Figure 2.2-1b)

The Smith Mine is in granitic rocks and migmatite of the Idaho batholith. In this area, the igneous rocks have intruded schist and quartzite of the Middle or Early Proterozoic Syringa metamorphic sequence (Lewis and others, 1992b). Zilka and others (1987, p. 19) noted: “Several northerly striking and steeply dipping quartz veins are in schist and gneiss.”

3.19.3 Site History

This property was owned for many years by Walter E. Smith. In 1934 and 1935, Bunker Hill had an agreement with Smith to purchase the property for $75,000. Bunker Hill did several hundred feet of tunnel work before dropping the claims (Gordon, 1973). Twelve tons of gold/silver ore were shipped during 1938-1940 (Zilka and others, 1987). Apparently Smith made other attempts to lease or sell the claims (Gordon, 1973). Smith Mines, Inc., was incorporated in 1955. Walter Smith was president, and the company leased the property from Smith in 1956. Total development at that time was 335 feet of workings, including two tunnels (250 feet and 85 feet) and one 25-foot shaft. Ten tons of ore were produced during 1957 and 1958 (Zilka and others, 1987). After doing little more than assessment work, Smith Mines forfeited its corporate charter in 1963. A map of the claim group in the Forest Service files, dated 1982, noted “Smith Mine Partners” as the claim holders. Zilka and others (1987) reported four caved adits and one shaft on the property.

3.19.4 Environmental Conditions

3.19.4.1 Site Features

The Smith Mine was visited by John Kauffman, accompanied by Mr. Vern Bretz of the U.S. Forest Service, on August 25, 1999. A video segment describing the property is on Clearwater National Forest Videotape (Tape 5, index 00:49:20-00:57:41). Documenting photographs are Roll K20, frames 25-26, and Roll K21, frame 1.
A hand-drawn claim map of the property in the Clearwater National Forest files shows five adits ranging from 100 to 250 feet in length. These have been transferred to a more accurate version of the claim map (Figure 3.19-2). Only the main adit on the Hub claim was found, along with a possible caved shaft. The property had a 25-foot shaft in the 1950s, although its exact location is not known. The adit on the Alder Gulch Discovery claim may have been found; the other adits could not be located.

The Hub Claim adit, which is completely caved, is on the west side of the drainage where the road switches back across the creek. This is the adit labeled as “Smith Mine” on the topographic map. The portal is about 100 feet west of the road in thick brush, and the caved adit can be traced 15-20 feet up the slope. Rotten timbers protrude through the debris (Figure 3.19-3). Strongly iron-stained water flows from the adit at a volume of 3-5 gallons per minute (Figure 3.19-4). The water flows to the edge of the road, then follows the road to the creek. No waste rock is evident; the access road, probably improved during logging operations in the area, may have incorporated most of the material. A bulldozer trench is on the slope above the Hub adit. About 100 feet south of the adit, on the edge of the access road, is a pit with rectangular log cribbing and cross-supports similar to the cribbing seen in some shafts (Figure 3.19-5). This pit may be the shaft reported to be at the mine. If so, the shaft is caved to within 3 feet of the surface. Rock fragments surrounding the pit contain vein quartz, but a waste dump is not evident.

A brush-filled gully with a small flat area and a minor seep are near the location of the adit shown to the northeast of the Hub Claim adit on the topographic map. This is also near the location of the Alder Gulch No. 2 adit. A slump on the slope may be above the caved tunnel. This hillside is an old burn and is now overgrown with small trees and thick brush.

The adits on the Selway Discovery, the Granite No. 1, and the Selway No. 3 claims were not found. All of these are in areas of thick timber or dense brush, and any workings could easily be obscured.

The disturbed area at the site is minimal. Most of the area has been modified by logging operations, possibly in response to several burns in the area.

3.19.4.2 Sample Locations

3.19.4.2.1 Solid Samples
No solid samples were collected.

3.19.4.2.2 Water Samples

Water sample K8259901 was collected in front of the caved Hub adit. Sample K8259902 was taken from the creek about 75 feet above the switchback on the road. Sample K8259903 was taken about 150 feet downstream 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>
</tr>
</thead>
<tbody>
<tr>
<td>K8259901</td>
<td>Smith Mine, Hub claim adit</td>
<td>112</td>
<td>43</td>
<td>6.6</td>
<td>3-5</td>
<td>Yes</td>
</tr>
<tr>
<td>K8259902</td>
<td>Smith Mine, upstream</td>
<td>28</td>
<td>57</td>
<td>6.8</td>
<td>3 ft. wide, 0.5 ft. deep</td>
<td>Yes</td>
</tr>
<tr>
<td>K8259903</td>
<td>Smith Mine, downstream</td>
<td>31</td>
<td>57</td>
<td>6.7</td>
<td>3 ft. wide, 0.5 ft. deep</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.19.4.2.3 Analytical Results

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

Sample K8259901 from the caved Hub adit exceeds the Secondary MCLs for aluminum, iron, and manganese; the Aquatic Life Acute standard for iron; and the Aquatic Life Chronic standard for aluminum in the dissolved metals screen. In the total recoverable metals screen, sample K8259901 exceeds the Secondary MCLs for iron and manganese and the Aquatic Life Acute standard for iron. In the EPA Test 200.9 for arsenic, the sample exceeds the primary MCL.

Upstream sample K8259902 is within the range of the Secondary MCL for aluminum in the dissolved metals screen.

Downstream sample K8259903 exceeds the Aquatic Life Chronic standard and is within the range of the Secondary MCL for aluminum in the dissolved metals screen. In the total recoverable metals screen, sample K8259903 exceeds the Secondary MCL for iron. In the EPA Test 200.9 for arsenic, the sample exceeds the primary MCL.

3.19.5 Structures

No structures were found.

3.19.6 Safety

No safety hazards were found.
Figure 3.19-1. Location of the Smith Mine, Idaho County, Idaho (U.S. Geological Survey Syringa 7.5-minute topographic map).
Figure 3.19-2. Claim map of the Smith Mine (USFS Clearwater National Forest mineral property files). Approximate location of other adits, shown on a hand-drawn map of the property, are marked by an "X."
Figure 3.19-3. Rotten timbers of the caved Hub Claim adit at the Smith Mine, looking west (Roll K20, frame #25).

Figure 3.19-4. Iron-stained water flowing from the Hub Claim adit at the Smith Mine (Roll K20, frame #26).
Figure 3.19-5. Cribbing of a possible caved shaft at the Smith Mine (Roll K21, frame #1).
3.20 CANYON CREEK MINE (Site No. HM-229)

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

The Canyon Creek Mine is on Canyon Creek just west of U.S. Highway 12, in the SW¼ of the SE¼ and the SE¼ of the SW¼ of section 11, T. 33 N., R. 7 E., on the Lowell 7.5-minute quadrangle (Figure 3.20-1). A short access road off Highway 12 ends at the property. A foot trail along Canyon Creek leads to several of the workings, all of which are on Forest Service land.

3.20.2 Geologic Features (Figure 2.2-1b)

The Canyon Creek Mine is in an area underlain by migmatite, Cretaceous granitic rocks of the Idaho batholith, and schist and quartzite of the Middle to Early Proterozoic Syringa metamorphic sequence (Lewis and others, 1992b). Most of the workings appear to be in or near the zone of migmatite that separates the Cretaceous rocks from the Precambrian rocks.

3.20.3 Site History

Nothing was found about the history of this property.

3.20.4 Environmental Conditions

3.20.4.1 Site Features

The Canyon Creek Mine was visited by John Kauffman on August 25, 1999. A video segment describing the property is on Clearwater National Forest Videotape (Tape 5, index 00:57:46-01:06:01). Documenting photographs are Roll K19, frame 20, and Roll K21, frames 2-3.

This property consists of four adits, all closed by the Forest Service, and one open inclined shaft. The adits are near Canyon Creek on both sides of the drainage. The shaft is about 400 feet up the slope at the end of an old bulldozer trail on the south side of the creek (Figure 3.20-2).

Adit 1 is about 100 feet west of Highway 12 where the access road bends from west to south. The opening has been covered with rock rubble (Figure 3.20-3). Most or all of the dump has been incorporated into the access road or removed by the creek.

Adit 2 is about 1,000 feet west of the end of the short access road on the north side of the creek. The adit has been covered in the same way as Adit 1. Little or no waste rock remains.

Adit 3 is about 400 feet northwest of Adit 2 and also is along the trail on the north side of the creek. Again the adit has been covered (Figure 3.20-4), and little or no waste rock is present.

Adit 4 is directly across Canyon Creek from Adit 3 and about 100 feet south of the creek. Large blocks of rock have been used to cover this adit, and a small waste dump extends out beneath the
rubble (Figure 3.20-5). The dump measures 10 feet long, 4 feet wide on top, and about 10 feet thick.

From Adit 4, an old bulldozer trail goes southeast up the slope and ends at the shaft. This decline is open and inclined at 45-55° to the west or southwest. A sheet of plywood has been propped up about 10-15 feet inside, partially blocking the opening. A rock tossed past the plywood hit water almost immediately, indicating the shaft is nearly full of water. The waste dump has been modified considerably by bulldozer work, but sufficient material is present for at least 50 feet of workings. No photographs or video were taken of the decline.

3.20.4.2 Sample Locations

3.20.4.2.1 Solid Samples
No solid samples were collected.

3.20.4.2.2 Water Samples
No water samples were collected.

3.20.5 Structures

Only a large concrete slab was found at the site, about 15 feet above an open flat area southwest of Adit 1 at the end of the short access road. The slab is 25 feet long and 15 feet wide. A minor amount of scrap metal and a few old boards are scattered around the site.

3.20.6 Safety

The open inclined shaft, although not easily found without prior knowledge of its location, could be entered. The plywood sheet inside does not completely block the shaft. The water in the shaft beyond the plywood is an additional hazard.
Figure 3.20-1. Location of the Canyon Creek Mine, Idaho County, Idaho (U.S. Geological Survey Lowell 7.5-minute topographic map).
Figure 3.20-2. Sketch of the Canyon Creek Mine.
Figure 3.20-3. Covered Adit 1 at the Canyon Creek Mine, looking northwest (Roll K19, frame #20).
Figure 3.20-4. Covered Adit 3 at the Canyon Creek Mine, looking north (Roll K21, frame #3).
Figure 3.20-5. Looking south at Adit 4 of the Canyon Creek Mine. The large blocks of rock have been used to cover the adit. The face of the waste dump is below the rock rubble (Roll K21, frame #2).
3.21 CLEARWATER GOLD AND COPPER MINE (Site No. HM-17)
Alternate names—Clearwater Mine; Clearwater Copper Mine; Clearwater Mine and Placer; N and F Placer.

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

The Clearwater Gold and Copper Mine is near the confluence of Caledonia Creek and Niagara Gulch, two drainages which feed into the upper reaches of the North Fork of the Clearwater River. A group of patented claims extends from section 11 on the north through section 14, into sections 23 and 24, and ends in the NW¼ of section 25, T. 42 N., R. 10 E., on the Chamberlain Mtn. 7.5-minute quadrangle (Figure 3.21-1). The property can be reached from either Kelly Forks on the North Fork of the Clearwater River or from Superior, Montana. From Kelly Forks, access is on FS Road 250 northeast to FS Road 720 (or east and then north on FS Road 255 to 720), west on 720 to Fly Hill where the road number changes to 715, and then north on Road 715 to the connection with FS Road 723. The main workings are about 2½ miles south on Road 723. The road ends at a cabin on the property. From Superior, access is on FS Road 320 (Cedar Creek Road, 1 mile southeast of Superior) about 22 miles to the Idaho border, about 5 miles from the border to FS Road 715, and then 2½ miles south to the connection with FS Road 723, the same junction as for the route from Kelly Forks. The patented claims are surrounded by Forest Service land.

3.21.2 Geologic Features (Figure 2.2-1a)

The Clearwater Gold and Copper Mine is in rocks of the Wallace Formation (Lewis and others, 1992a). Semple and Featherstone (1943, p. 3-4) described the deposit as follows:

The ore occurs as a fracture filling, with some wall rock replacement, in quartzite. The vein strikes approximately N. 10° W. and dips 45° northeast. The vein filling consists chiefly of massive iron carbonate (siderite?) with disseminated chalcopyrite, bornite, and pyrite. Two areas, one about twenty feet long and forty feet from the winze, and the other about forty feet long and 780 feet in from the portal, show one to four inch stringers of chalcopyrite over widths of eight feet. Banded quartz and brecciated quartzite with quartz filling is common along the vein walls. A cross-cut to the winze on No. 3 level shows a vein width of twenty feet of disseminated chalcopyrite. In many places the full width of the vein is not exposed as the drift follows the footwall portion only. A strong fault, striking northeast and dipping northwest, cuts the vein 800 feet from the portal of No. 3 level. Little work has been done beyond this point. Although surface outcrops indicate a continuation, the vein has not been located underground.

Secondary minerals in the oxidized portions of the vein consist of cuprite, azurite, and malachite (Semple and Featherstone, 1943). Figure 3.21-2 is a map of the underground workings on the No. 2 and No. 3 levels.
According to Anderson (1930), the iron carbonate vein filling is ankerite and the dip of the vein is 70° E.

3.21.3 Site History

The property was first worked by gold prospectors, who were attracted by the free gold in the oxidized outcrops (Semple and Featherstone, 1943). Most of the underground prospecting was done between 1900 and 1910 (Causey and Marks, 1993).

The Clearwater Gold and Copper Mining Company, Ltd., was incorporated on July 26, 1907. In 1913, the mine had two tunnels (150 feet and 900 feet long), several crosscuts, two raises, and two shafts (IGS mineral property files). Between 1908 and 1917, eighteen claims (fifteen lode and three placer) were surveyed for patent. Eleven of the lode claims and all three placer claims were eventually patented (Causey and Marks, 1993).

Clearwater Gold and Copper forfeited its corporate charter in 1920, but the charter was reinstated in 1926. Little work was done on the property after 1920 (IGS mineral property files). In 1929, the mine had 1,200 feet of tunnels and several raises on the lower level and an estimated 500 feet of workings on a caved upper level (Anderson, 1930). In 1940, Anaconda Copper Mining Company examined the property (Causey and Marks, 1993). In 1941, the company cleaned out the old workings. The camp had a ten-man boarding house, storage sheds, a partly equipped blacksmith shop, and a small hydroelectric plant left from previous operations (Semple and Featherstone, 1943; Featherstone, 1942). In 1942, the mine’s No. 3 level had 800 feet of drifts, 300 feet of crosscuts, and a 110-foot winze sunk on the vein 135 feet from the portal. The No. 2 level had 400 feet of drifts and 100 feet of crosscuts. The No. 1 level was a 50-foot tunnel. The No. 2 and No. 3 levels were connected by an 80-foot raise, and the No. 1 and No. 2 levels were caved at the portals (Semple and Featherstone, 1943).

In 1953, the company changed its name to Clearwater Mines, Inc., and proposed to rehabilitate the property. Although some minor exploration work was done, most of the activity on the property consisted of annual assessment work on the unpatented claims.

In 1990, only one house was at the site. All the adits were caved at the portals in 1991 (Causey and Marks, 1993).

3.21.4 Environmental Conditions

3.21.4.1 Site Features

The Clearwater Gold and Copper Mine was visited by John Kauffman on September 1, 1999. A video segment describing the property is on Clearwater National Forest Videotape (Tape 5, index 01:06:07-01:14:14). Documenting photographs are Roll K21, frames 13-21.

Workings found at this property include two main adits (both caved), a bulldozer cut, and one minor adit about 1 mile north of the main adits (Figure 3.21-4). In addition to the workings, two
intact buildings (a metal-sided shed or cabin and an A-frame cabin) and at least two collapsed buildings were found.

Adit 1, the No. 2 level, is on the west side of a tributary gully to Niagara Gulch and about 200 feet north of the main access road. The caved adit forms a wide trough about 50 feet long on the slope (Figure 3.21-5). About 50 feet above the adit is an open bulldozer cut across the nose of the ridge. This cut, visible through the trees in Figure 3.21-5, may be the caved 50-foot long No. 1 level mentioned by Causey and Marks (1993) and company reports to the Idaho Inspector of Mines. The waste dump for Adit 1 is 60 feet long, 60 feet wide, and 15-20 feet thick (Figure 3.21-6). Water in the gully flows around the edge of the dump and has slightly eroded the toe. According to Causey and Marks (1993), there were about 500 feet of total workings on this level.

Adit 2, beside the main access road south and slightly east of Adit 1, is the No. 3 level. This adit also is caved and forms a trough on the slope (Figure 3.21-7). Several of the old timbers are in the collapsed debris. Water flows from the adit at the rate of about 5 gallons per minute, then passes through a black plastic culvert under the road and discharges into the creek (Figure 3.21-8). The waste dump consists of two parts: the original dump at adit level and more recent material that has been piled onto the old dump (Figures 3.96-9 and 3.21-10). Old, bent rails extend from the adit across the west end of the original dump. This older portion measures about 180 feet long, 10-50 feet wide, and 6-8 feet thick. The more recent material on top of the original dump is about 100 feet long, 15-20 feet wide, and 8-12 feet thick. The source for the more recent material is not known.

A third, very minor, caved adit was found about 1 mile north of the main workings, on the west (downhill) side of the access road. It is about at the bend in the Idaho claim (Figure 3.21-3). The waste dump is 12 feet long, 9 feet wide, and 4-6 feet thick.

The disturbed area at this property, including the waste dumps, bulldozer cut, camp area, and cabin, covers several acres.

3.21.4.2 Sample Locations

3.21.4.2.1 Solid Samples

Samples were collected from the waste dumps for Adit 1 (K9019901) and Adit 2 (K9019905).

<table>
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<th>Sample No.</th>
<th>Location</th>
<th>Analyzed (Yes/No)</th>
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<td>K9019901</td>
<td>Clearwater Gold and Copper Mine, Adit 1 waste dump</td>
<td>Yes</td>
</tr>
<tr>
<td>K9019905</td>
<td>Clearwater Gold and Copper Mine, Adit 2 waste dump</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.21.4.2.2 Water Samples

Sample K9019902 was collected at Adit 2 where the water flows through the plastic culvert. Sample K9019903 was collected about 100 feet downstream from the Adit 2 waste dump on Niagara Gulch Creek. Sample K9019904 was collected several hundred feet upstream from Adit 1 on Niagara Gulch 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>
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<tbody>
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<td>Clearwater Gold and Copper, Adit 2</td>
<td>34</td>
<td>40</td>
<td>7.3</td>
<td>5</td>
<td>Yes</td>
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<tr>
<td>K9019903</td>
<td>downstream on Niagara Gulch</td>
<td>24</td>
<td>43</td>
<td>7.6</td>
<td>12 ft. wide, 1 ft. deep</td>
<td>Yes</td>
</tr>
<tr>
<td>K9019904</td>
<td>upstream on Niagara Gulch</td>
<td>23</td>
<td>43</td>
<td>7.7</td>
<td>12 ft. wide, 1 ft. deep</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.21.4.2.3 Analytical Results

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

Sample K9019901 from the waste dump for Adit 1 exceeds environmental and background levels for arsenic, cadmium, and copper in the element screen. Sample K9019905 from the waste dump for Adit 2 exceeds environmental and background levels for arsenic, cadmium, copper, iron, lead, manganese, and nickel in the element screen. In the TCLP for metals screen, no elements of interest are leaching from either sample.

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

Sample K9019903, collected from downstream on Niagara Gulch Creek, exceeds the Aquatic Life Chronic standard for cadmium and is within the range of the Secondary MCL for aluminum in the dissolved metals screen. No other standards are exceeded by any of these samples.

3.21.5 Structures

Two intact buildings are at the property. One is a metal-sided shed or cabin near Adit 1 (Figure 3.21-11). This structure is about 20 feet long and 12 feet wide. The interior is set up as living quarters, with a wood stove, a sink, cabinets, a table, and chairs (Figure 3.21-12). An outhouse in poor condition is on the east side of the building. The second building is an A-frame cabin at the end of the access road (Figure 3.21-13). There is also an outhouse at this site.
At least two collapsed buildings were noted, one of which can be seen in Figure 3.21-11 on the right side of the road. Another is on the east side of the metal-sided shed (behind the shed in Figure 3.21-11).

In addition to the buildings, there is a considerable amount of junk, some of which is shown in Figure 3.21-11 on the left side of the road. Other scrap metal, old boards, and recent garbage is scattered around.

3.21.6 Safety

No safety hazards were found.
Figure 3.21-1. Location of the Clearwater Gold and Copper Mine, Shoshone County, Idaho (U.S. Geological Survey Chamberlain Mtn. 7.5-minute topographic map).
Figure 3.21-2. Underground geology map of the Clearwater Gold and Copper Mine (Causey and Marks, 1993, Figure 8).
Figure 3.21-3. Claim map of the Clearwater Gold and Copper Mine (Causey and Marks, 1993, Figure 7). Patented claims are shown in solid lines and unpatented claims in broken lines. The locations of the adits and cabin have been added to the original figure.
Figure 3.21-4. Sketch of the main Clearwater Gold and Copper Mine workings.
Figure 3.21-5. Looking north at the trough of caved Adit 1 (No. 2 level) at the Clearwater Gold and Copper Mine. A bulldozer cut in the trees above the trough may be at the site of the caved 50-foot adit noted by Causey and Marks (1993) (Roll K21, frame #13).

Figure 3.21-6. Looking south down the face of the waste dump for Adit 1 at the Clearwater Gold and Copper Mine. The roof of the metal-sided shed is at the upper right of the picture (Roll K21, frame #14).
Figure 3.21-7. Looking north at caved Adit 2 (No. 3 level) at the Clearwater Gold and Copper Mine. Old timbers protrude through the caved debris. The access road is at the lower edge of the picture (Roll K21, frame #17).
Figure 3.21-8. Looking southeast from Adit 2 at the Clearwater Gold and Copper Mine. Water from the adit flows under the road through the black plastic culvert at the center of the lower part of the picture. Rails from the adit are in the shade above the culvert. The surface of the older part of the waste dump is covered with weeds and small trees. The reddish-brown pile of more recent material is nearly bare (Roll K21, frame #18).
Figure 3.21-9. Looking east at part of the waste dump for Adit 2 at the Clearwater Gold and Copper Mine. The older portion is at the right edge, covered with moss and a few trees. The more recent material is in the foreground. The access road is off the left edge of the picture (Roll K21, frame #19).

Figure 3.21-10. Looking east along the south face of the more recent pile of waste rock on the waste dump for Adit 2 at the Clearwater Gold and Copper Mine. The older dump surface is at the lower right, covered with brush and small trees (Roll K21, frame #20).
Figure 3.21-11. Looking east at the metal-sided building along Niagara Gulch at the Clearwater Gold and Copper Mine. A junk car body is along the left side of the road, and a collapsed building is on the right side. The creek is to the right of the picture (Roll K21, frame #15).

Figure 3.21-12. View inside the metal-sided shed at the Clearwater Gold and Copper Mine (Roll K21, frame #16).
Figure 3.21-13. A-frame cabin and outhouse at the end of the access road at the Clearwater Gold and Copper Mine. The cabin is about 500 feet east of Adit 2 (Roll K21, frame #21).
3.22 BOSTONIA PROSPECT (Site No. K9019906)

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

The Bostonia Prospect is on the ridge north of the head of Bostonian Creek in the SW¼ of the SE¼ of the SW¼ of section 1, T. 42 N., R. 10 E., on the Sherlock Peak 7.5-minute quadrangle (Figure 3.22-1). Access is the same as for the Clearwater Gold and Copper Mine up to the junction of FS Road 715 with FS Road 723. The prospect is about ½ mile east of the junction on the crest of the divide between the upper St. Joe River and Bostonian Creek. An old bulldozer trail follows the ridge top for about ¼ mile before the trail becomes obscure. The site is on Forest Service land.

3.22.2 Geologic Features (Figure 2.2-1a)

This prospect is in rocks of the lower Prichard Formation (Harrison and others, 1986). Quartz, calcite, siderite/ankerite veins, and gouge that contain scattered pods of massive pyrite occur in gray, blocky quartzite (Causey and Marks, 1993).

3.22.3 Site History

Nothing is known about the history of this prospect.

3.22.4 Environmental Conditions

3.22.4.1 Site Features

The Bostonia Prospect was visited by John Kauffman on September 1, 1999. A video segment describing the site is on Clearwater National Forest Videotape (Tape 5, index 01:14:19-01:17:58). Documenting photograph is Roll K21, frame 22.

Causey and Marks (1993, p. 32) reported “One caved adit, estimated less than 200 ft long, and two prospect pits” at the Bostonia Prospect. Only a pit or shallow caved shaft was found. The pit, located on top of the ridge, is about 12-14 feet in diameter and 7-8 feet deep (Figure 3.22-2). There is a small mound of rock piled around the pit. The caved adit is probably in the vicinity, but brush and trees may have obscured it. Causey and Marks (1993) did not give an accurate description of its location. The disturbed area at the pit is minimal.

3.22.4.2 Sample Locations

3.22.4.2.1 Solid Samples

No solid samples were collected.

3.22.4.2.2 Water Samples

No water samples were collected.
3.22.5 Structures
   No structures were found.

3.22.6 Safety

No safety hazards were found, although the caved adit reported by Causey and Marks (1993) was not found. Unless the adit has been reopened, it would not be a hazard.
Figure 3.22-1. Location of the Bostonia Prospect, Shoshone County, Idaho (U.S. Geological Survey Sherlock Peak 7.5-minute topographic map).
Figure 3.22-2. Shallow pit at the Bostonia Prospect. The pit measures about 12-14 feet in diameter and 7-8 feet deep. Numerous saplings are growing in the pit (Roll K21, frame #22).
REFERENCES


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

201
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 ________________________________

| Commodity (s) | | |
| Production (ounces) | | |

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

| Commodity(s) | | |
| Production (ounces) | | |

202
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

203
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 1 - ADITS, SHAFTS, PITS, AND OTHER OPENINGS

<table>
<thead>
<tr>
<th>Opening Number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Opening</td>
<td></td>
</tr>
<tr>
<td>Ownership</td>
<td></td>
</tr>
<tr>
<td>Opening Length (ft)</td>
<td></td>
</tr>
<tr>
<td>Opening Width (ft)</td>
<td></td>
</tr>
<tr>
<td>Latitude (GPS)</td>
<td></td>
</tr>
<tr>
<td>Longitude (GPS)</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td></td>
</tr>
<tr>
<td>Ground water</td>
<td></td>
</tr>
<tr>
<td>Water Sample #</td>
<td></td>
</tr>
<tr>
<td>Photo Number</td>
<td></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 visually 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>
<thead>
<tr>
<th>TABLE 2 - DUMPS, TAILINGS, AND SPOIL PILES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Number</td>
</tr>
<tr>
<td>Waste Type</td>
</tr>
<tr>
<td>Ownership</td>
</tr>
<tr>
<td>Area (acres)</td>
</tr>
<tr>
<td>Volume (cu yds)</td>
</tr>
<tr>
<td>Size of Material</td>
</tr>
<tr>
<td>Wind Erosion</td>
</tr>
<tr>
<td>Vegetation</td>
</tr>
<tr>
<td>Surface Drainage</td>
</tr>
<tr>
<td>Indicators of Metals</td>
</tr>
<tr>
<td>Stability</td>
</tr>
<tr>
<td>Location with respect to Floodplain</td>
</tr>
<tr>
<td>Distance to Stream</td>
</tr>
<tr>
<td>Water Sample #</td>
</tr>
<tr>
<td>Waste Sample #</td>
</tr>
<tr>
<td>Soil Sample #</td>
</tr>
<tr>
<td>Photo Number</td>
</tr>
</tbody>
</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= None, 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

205
8. SAMPLES

Take samples only on National Forest lands.

![Table 3 - Water Samples from Mine Site Discharges](image)

### 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, FOND=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, SUU=Sulfides 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>
<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

207
<table>
<thead>
<tr>
<th>TABLE 5 - WASTE SAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Number</td>
</tr>
<tr>
<td>Date of sample</td>
</tr>
<tr>
<td>Sampler (Initials)</td>
</tr>
<tr>
<td>Sample Type</td>
</tr>
<tr>
<td>Waste Type</td>
</tr>
<tr>
<td>Feature Number</td>
</tr>
<tr>
<td>Sample Latitude</td>
</tr>
<tr>
<td>Sample Longitude</td>
</tr>
<tr>
<td>Photo Number</td>
</tr>
</tbody>
</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>
<thead>
<tr>
<th>Sample Number</th>
<th>Date of sample</th>
<th>Sampler (Initials)</th>
<th>Sample Type</th>
<th>Sample Latitude</th>
<th>Sample Longitude</th>
<th>Likely Source of Contamination</th>
<th>Feature Number</th>
<th>Indicators of Contamination</th>
<th>Photo Number</th>
</tr>
</thead>
</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
### TABLE 7 - HAZARDOUS WASTES/MATERIALS

<table>
<thead>
<tr>
<th>Waste Number</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Containment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition of Containment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Quantity of Waste</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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=Explain in comments, NO=NO or none

Type: CABIN=Cabin or community service (store, church, etc.), MILL=mill building, MINE=building related to mine 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 number 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
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 $3\sigma$ for a 99% confidence level, where $\sigma$ 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 $10\sigma$ 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.

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 B): 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, 211 p., 1 videotape.

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 C): 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, 225 p., 1 videotape.

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2000 Reports


Appendix F
Other Properties and Prospects Not Found
Active Prospect

Hi-Lead Mine (Site No. K8109901)
This is an active mine at the head of Pioneer Gulch, a tributary to Osier Creek. The Hi-Lead Mine is in the SW¼ of the SE¼ of the SW¼ of section 17, T. 40 N., R. 11 E., on the Osier Ridge 7.5-minute quadrangle. The property was posted and no one was available at the site on the day of the visit. At the time, the property was assumed to be private, but later Mr. Vern Bretz of the U. S. Forest Service indicated the mine is on Forest Service land.

Minor Prospects

Black Diamond Graphite Prospect (Site No. HM-190)
This prospect is in the W½ of section 14 and E½ of section 15, T. 36 N., R. 6 E., on the Hemlock Butte 7.5-minute quadrangle. A claim map in the files of the Clearwater National Forest shows several trenches on the prospect, but no underground workings are noted. The area of the claims has been clear-cut in the past and is now overgrown with a dense stand of small trees and thick brush. One possible old trench was noted near the west side of the claim group along FS Road 5173. It does not appear that there has been any recent activity on the claims.

Unnamed Prospects (Site No. K8259904)
A series of long, deep bulldozer cuts are on the slope above FS Road 101 about 1 mile (by road) south of Fan Creek Saddle, in the NW¼ of section 1 and the NE¼ of section 2, T. 33 N., R. 6 E., on the Syringa 7.5-minute quadrangle. These are presumed to be prospect trenches, although no information was found about this site.

Properties Not Found

Wild Rose Mine (Site No. HM-169)
Several attempts were made to locate the Wild Rose workings, presumed to be in Clearwater Gulch east of Pierce. A very poor map in Thomson and Ballard (1924) shows the mine in the vicinity of where several patented claims are shown in the gulch on the Clearwater National Forest map. However, no workings were found that fitted those described by Thomson and Ballard (1924).

Pistol Grip Mine (Site No. HM-178)
This mine is labeled on the topographic map on upper Trapper Gulch in the NE¼ of the NE¼ of the SE¼ of section 3, T. 36 N., R. 6 E., on the Hemlock Butte 7.5-minute quadrangle. Two unsuccessful attempts were made to find this mine. One of the traverses extended upstream and downstream from the site shown on the map. The bottom of the drainage is overgrown with thick, tall ferns, alder thickets, and other brush for the entire length checked, and an adit could easily have been overlooked. The dump for this adit, which is shown at creek level, may have been washed away by the creek.

An adit symbol is also shown in the N½ of section 10 on the Hemlock Butte topographic map. This site is on the top of the ridge between Trapper Gulch and Gezel Creek, about 1 mile south of the
Pistol Grip. Construction of a relatively new logging access road along the ridge may have destroyed the adit. Some vein quartz was noted near the site on the road. No other indication of the adit was noted, and no waste dump was found.

Lost Cabin Lode Prospect (Site No. HM-45)
This prospect is reported to be on Deadwood Creek, a tributary to Moose Creek, probably in section 25, T. 40 N., R. 10 E., on the Moose Mountain 7.5-minute quadrangle. Parts of FS Roads 5431 and 5431B were checked for evidence of prospecting. Some of this area has been logged and is now overgrown with thick stands of small trees and brush. The remainder of the area is densely forested. A few quartz fragments were noted on the roads, but no trenches or pits were found.

Moose Mountain Prospects (Site No. HM-41)
Prospects have been reported in the Moose Mountain area (section 27, T. 40 N., R. 10 E., on the Moose Mountain 7.5-minute quadrangle), although no specific sites or workings are identified. Trail 455 was hiked from the end of FS Road 734B on Deadwood Ridge to Trail 427, then southwest to the top of Moose Mountain, a total distance of about 4 miles. No workings were found along any part of the trail, although vein quartz and pegmatite intrusions cut the nearly vertical schist. Two very shallow, small depressions on top of Moose Mountain may have been hand dug, but probably are not prospects. No quartz or pegmatite fragments were found on the small piles of excavated material.

Hoodoo Pass Prospect (No Site Number)
Causey and Marks (1993) report a pit 14 feet in diameter and 6 feet deep on the ridge top at the Idaho-Montana border on FS Road 5428 (probably in the west-central part of section 23, T. 42 N., R. 11 E., on the Hoodoo Pass 7.5-minute quadrangle). This road, accessible from the Montana side, is blocked by a ditch and berm at the border. Neither this pit nor any other prospects were found during a brief reconnaissance of the area.
Appendix G
GPS Readings for Properties in the Palouse, Pierce, North Fork, Lochsa and Powell Ranger Districts of the Clearwater National Forest

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Site Name</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>K6079901</td>
<td>Milbert Quartz Lode</td>
<td>46° 59.91'</td>
<td>116° 48.34'</td>
<td></td>
</tr>
<tr>
<td>PL-1</td>
<td>Carrico Mine, shaft 1</td>
<td>46° 59.752'</td>
<td>116° 48.435'</td>
<td></td>
</tr>
<tr>
<td>PL-1</td>
<td>Carrico Mine, shaft 2</td>
<td>46° 59.695'</td>
<td>116° 48.465'</td>
<td></td>
</tr>
<tr>
<td>PL-1</td>
<td>Carrico Mine, adit</td>
<td>46° 59.527'</td>
<td>116° 48.480'</td>
<td></td>
</tr>
<tr>
<td>PL-4</td>
<td>Lost Wheelbarrow Mine, shaft 1</td>
<td>46° 59.817'</td>
<td>116° 47.180'</td>
<td></td>
</tr>
<tr>
<td>PL-4</td>
<td>Lost Wheelbarrow Mine, shaft 2</td>
<td>46° 59.827'</td>
<td>116° 47.052'</td>
<td></td>
</tr>
<tr>
<td>PL-3</td>
<td>Prosperity Group</td>
<td>46° 59.94'</td>
<td>116° 48.135'</td>
<td>at east end of upper trench</td>
</tr>
<tr>
<td>K6099901</td>
<td>Unnamed Prospect</td>
<td>46° 59.837'</td>
<td>116° 48.215'</td>
<td>on west rim of caved shaft</td>
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<tr>
<td>PL-7</td>
<td>Reservoir Creek</td>
<td>46° 59.075'</td>
<td>116° 48.472'</td>
<td></td>
</tr>
<tr>
<td>K6109901</td>
<td>Unnamed Prospect</td>
<td>46° 58.95'</td>
<td>116° 46.96'</td>
<td>may be questionable readings</td>
</tr>
<tr>
<td>PL-9</td>
<td>Black Horse Prospect</td>
<td>46° 57.973'</td>
<td>116° 45.362'</td>
<td>shallow pits</td>
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<tr>
<td>PL-11</td>
<td>Copper Ridge Prospect</td>
<td>46° 58.625'</td>
<td>116° 45.534'</td>
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</tr>
<tr>
<td>PL-18</td>
<td>Last Chance Prospect</td>
<td>46° 57.332'</td>
<td>116° 44.301'</td>
<td>20 ft. east of collapsed cabin along trail</td>
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<tr>
<td>PL-29</td>
<td>Lodestone Prospect</td>
<td>46° 58.73'</td>
<td>116° 34.84'</td>
<td>@ concrete slab 50-75 ft. south of adit</td>
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<tr>
<td>K6179902</td>
<td>Gold Queen Prospect</td>
<td>46° 59.340'</td>
<td>116° 33.070'</td>
<td></td>
</tr>
<tr>
<td>SP-394</td>
<td>Hecla Prospect, adit 1</td>
<td>46° 00.206'</td>
<td>116° 30.334'</td>
<td></td>
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<tr>
<td>PL-51</td>
<td>Last Chance-Witherow Lease</td>
<td>46° 52.741'</td>
<td>116° 34.748'</td>
<td>@ large open cut</td>
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<tr>
<td>PL-55</td>
<td>Campbell Lease</td>
<td>46° 52.703'</td>
<td>116° 34.95'</td>
<td>20 ft. south and 100 ft. east of opening</td>
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<td>PL-44</td>
<td>Morning Star Prospect, adit 1</td>
<td>46° 53.89'</td>
<td>116° 34.440'</td>
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<tr>
<td>PL-46</td>
<td>Muscovite Mine, adit 2</td>
<td>46° 53.18'</td>
<td>116° 34.65'</td>
<td>probably No. 5 level of Stoll’s report</td>
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<tr>
<td>PL-43</td>
<td>Lucky Jim Prospect</td>
<td>46° 54.04'</td>
<td>116° 33.735'</td>
<td>@ shaft location, 150 ft. north of adit</td>
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<tr>
<td>K8319901</td>
<td>Bonami Prospect</td>
<td>46° 55.339'</td>
<td>116° 37.110'</td>
<td>@ adit; in thick tree cover</td>
</tr>
<tr>
<td>PL-80</td>
<td>Ruby Creek Mine, shaft, adit 2</td>
<td>46° 48.570'</td>
<td>116° 17.384'</td>
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<tr>
<td>HM-167</td>
<td>Bole Prospect</td>
<td>46° 29.356'</td>
<td>115° 45.248'</td>
<td>@ shaft</td>
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<tr>
<td>HM-95</td>
<td>New Red Lead Prospect</td>
<td>46° 40.271'</td>
<td>114° 50.717'</td>
<td>@ adit</td>
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