

**COLUMBIA MILL
PRELIMINARY ASSESSMENT REPORT
LEMHI, IDAHO**

**STATE OF IDAHO
DEPARTMENT OF ENVIRONMENTAL QUALITY**

December 2002

Submitted to:
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

1.11.8.4
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JUL 14 2003
D.E.Q. STATE WASTE
MANAGEMENT & REMEDIATION DIVISION

July 9, 2003

Reply To
Attn Of: ECL-115

Myrnalee Steen
631 St. Claire Dr.
Palo Alto, CA 94306

Dear Ms. Steen:

The Idaho Department of Environmental Quality (DEQ) has completed a report summarizing the findings of a visit conducted at the Columbia Mill site in August, 2002. A copy of the report, called a Preliminary Assessment, is enclosed.

Based on a review of this assessment, EPA has determined that no further action is warranted at the site. A no further action designation means that no additional steps under the Federal Superfund Program will be taken at the site unless new information warranting further Superfund consideration is discovered. EPA's no further action designation does not relieve your facility from complying with appropriate Idaho state regulations.

In accordance with EPA's decision regarding the tracking of no further action sites, the above named site will be removed from the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) data base and placed in a separate archival data base as a historical record. Archived sites may be returned to the CERCLIS site inventory if new information necessitating further Superfund consideration is discovered.

We appreciate your cooperation during the site visit. If you have any questions, please feel free to contact me at (206)553-2782.

Sincerely,

Ken Marcy
Site Assessment Manager

Enclosure

cc: Bruce Schuld, Idaho Department of Environmental Quality
Monica Lindeman, US EPA, ECL-115
Craig Conant, EPA SF Records Center, ECL-076



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1.11.8.4



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706-1255 • (208) 373-0502

Dirk Kempthorne, Governor
C. Stephen Allred, Director

January 8, 2003

Myrnalee Steen
Yellow Jacket Mining Company
631 Saint Claire Drive
Palo Alto, California 94306

RE: Preliminary Assessment of the Columbia Mill.

Dear Ms. Steen;

While investigating the Columbia Mill Mine Site, the Idaho Department of Environmental Quality (DEQ) conducted a cursory inspection for the completion of a Preliminary Assessment of mine workings on your property, the Columbia Mill (Site). DEQ appreciates your cooperation with our inspectors. The Preliminary Assessment Report (attached), which resulted from our visit, documents DEQ's findings relative to issues at the Site related to the use, handling and disposal of hazardous or deleterious materials. In brief, DEQ did not find anything, which may pose a risk to human health or the environment, and I am, therefore, not recommending any additional site visits or actions at the Site.

Although DEQ did not find any problems related to the Site, I would greatly appreciate the opportunity to assist you if you have and questions or concerns which may arise in the future. Thank you again.

Sincerely,

A handwritten signature in black ink, appearing to read "Bruce A. Schuld".

Bruce A. Schuld
Mine Waste Projects Coordinator
Waste Management & Remediation Division

BAS:ab C:\My Documents\Bruce\Correspondence\PA Letter Columbia Mill January 8.doc

attachment

cc: Jim Johnston, DEQ Idaho Falls Regional Office
Source File
Reading File

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LIST OF ACRONYMS

<u>Acronym</u>	<u>Definition</u>
amsl	above mean sea level
DEQ	Idaho Department of Environmental Quality
EPA	United States Environmental Protection Agency
gpm	gallons per minute
PPE	Probable Point of Entry
TDL	Target Distance Limit

1. INTRODUCTION

The Department of Environmental Quality (DEQ) was contracted by Region 10 of the United States Environmental Protection Agency (EPA) to provide technical support for completion of a preliminary assessment (PA) at the Columbia Mill site located near Challis, Idaho, in Lemhi County. DEQ completed PA activities in accordance with the goals listed below.

The specific goals for the Columbia Mill PA, identified by the DEQ, are to:

- Determine the potential threat to public health or the environment posed by the site.
- Determine the potential for a release of hazardous constituents into the environment.
- Determine the potential for placement of the site on the National Priorities List.

Conducting the PA included reviewing existing site information, collecting receptor information within the site's range of influence, determining regional characteristics, and conducting a site visit. This document includes a discussion of site background information (Section 2), a discussion of migration/exposure pathways and potential targets (Section 3), and a list of pertinent references. Photographic documentation is included in Appendix A and sample analyses are included in Appendix B.

2. SITE BACKGROUND

2.1 SITE LOCATION

Site Name: Columbia Mill

CERCLIS ID No.:

Location: Lemhi County, Idaho

Latitude: 44° 58' 38"N

Longitude: 114° 31' 51"W

Legal Description: Section 24, Township 19N, Range 16E, Boise Meridian

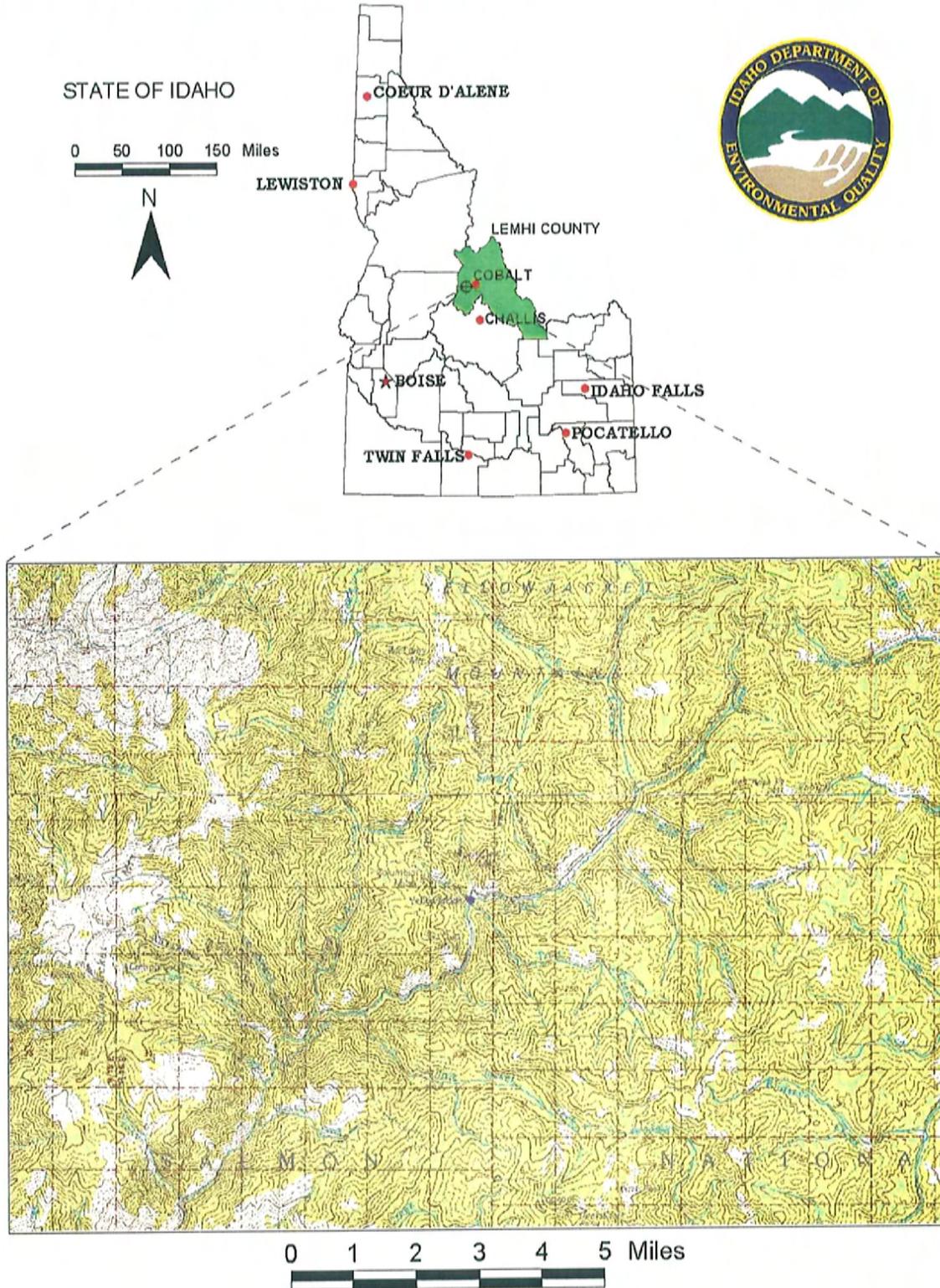
Congressional District: Idaho

Site Owner: Yellow Jacket Mining Company
c/o Myrnalee Steen
631 St. Claire Dr.
Palo Alto, CA 94306

Site Contact: Myrnalee Steen
631 St. Claire Dr.
Palo Alto, CA 94306

FIGURE 2-1

Fig 2-1 Site Vicinity Map; Columbia Mill Site



2.2 SITE DESCRIPTION/OWNERSHIP HISTORY

Columbia Mill (Mill) is a former gold milling facility located in Lemhi County, Idaho, approximately 50 miles north-northwest of Challis, Idaho, 50 miles southwest of Salmon, Idaho, and 20 miles southwest of the former townsite of Cobalt, Idaho (Figure 2-1). The Mill, located at the Yellowjacket townsite on Yellowjacket Creek at an elevation of 5,960 feet above mean sea level (amsl), lies approximately 0.85 miles south-southeast of the Yellowjacket Mine.

Umpleby (1913) described the ore of the Columbia Mine from a "specimen of altered calcareous schist from the northeast corner of the Columbia Mill contains many little veinlets of calcite, scattered quartz grains, pale-green hornblende, poikilitic scapolite (mizzonite), and a few flakes of biotite, each intergrown with or included in the other. Pyrite is sparsely distributed through the section" (p.167). "The principal veins strike N 50°-60° E. and dip northwest; other, of much less importance, strike almost at right angles to these. In places, as in the Black Eagle mine, the ore bodies follow the bedding, but more frequently, as in the Yellow Jacket and probably also the Columbia, they are independent of it" (ibid. p.169). The veins of the Columbia Mine occur "along breccia zones and the metallic contents are carried not only in the interstitial quartz, but often in the fragments of the schists and slates themselves" (Eldridge, 1895, p.53). Umpleby (1913) suggests the pyrite encountered at the Columbia Mine is devoid of gold, but the pyrite possibly carries gold in the other properties of the Yellowjacket District. The Columbia Mine contained base metals including "chalcopyrite, sphalerite, and galena, the latter two being nowhere abundant...In the Columbia chalcopyrite is more conspicuous and the gold may be included in it" (ibid. p. 169).

Ownership history of the Columbia Mine and Mill is vague. The Yellowjacket District was discovered in 1869. The principle mine of the district, the Yellowjacket, which was located on the North and South American patent claims, changed hands several times and was worked at intervals before 1897. It is not known whether the Columbia Mine was included in either of these patent claims. "Ore from the Columbia mine was originally treated in the Yellowjacket mill, but in the late nineties the Columbia mill was built nearby" (Ross, 1934, p. 108). The Mill, erected in 1892, included a 10 stamp battery and was located adjacent to the Van Horn Gulch tributary where it merges with Yellowjacket Creek (Photo CP056). According to Ross, the "Columbia mine was shut down in 1903" (ibid. p.108). "The Columbia Group, the mine and mill were rehabilitated and expect to be on a production basis in the near future" (IIM, 1936, p.207). No further information was available concerning the Columbia Mill.

In 1948, Edwin F. and Heber S. Steen, whose father had owned and operated the mine between 1888 and 1892, acquired the Yellowjacket mill and mine. In 1977, the Steen family consolidated their holdings, including the Yellowjacket and Columbia-Continental mines and the Yellowjacket and Columbia mills, under the name of Yellow Jacket Mines, Inc. (ibid.).



CP0560
Columbia Mill at left center

2.3 SITE OPERATIONS AND WASTE CHARACTERISTICS

The mineral deposits of the Columbia Mine consist chiefly of gold and copper with lesser silver, lead and zinc values. Base metals including chalcopyrite, sphalerite, galena, and pyrite appear to be the primary ore constituents processed by the Mill. Umpleby (1913) suggested that gold values were probably associated with the chalcopyrite. The Mill operated a 10-stamp battery until 1903. Although the Mill was refurbished in 1936, no information concerning operating equipment, capacity or production records were identified.

Mill tailings from operations lie within the Yellowjacket Creek drainage. Mill operations slurried the tailings into a pile along and into Yellowjacket Creek, east of the Mill. The Mill is located approximately 20 feet above Yellowjacket Creek.

2.4 DEQ ACTIONS

DEQ conducted a site visit on August 6, 2002. The owner of the property, Myrnalee Steen, was present during the site visit. Mrs. Steen provided historical accounts of the townsite of Yellowjacket, but little was known regarding the Columbia Mill. The Steens vacation on the property during the summer months, occupying a restored cabin (not pictured). Mrs. Steen did not accompany DEQ around the site. The site was not fenced, and easily accessible from the adjacent Yellowjacket Road, but posted with "Private Property" and no trespassing signage. Site features include the old Mill, kiln remains, a tailings pile, and an old cabin. The Mill building was apparently dismantled and removed, leaving only the remains of the kiln (Photo Mvc-006).



Mvc-006s

Mill ruins - kiln (center), cabin (right center), Yellowjacket hotel (far right)

A healthy growth of grasses and shrubs covers approximately 85 percent of the tailings pile (Photo Mvc-009s). The tailings appear fine-grained in texture and are moderately compacted.

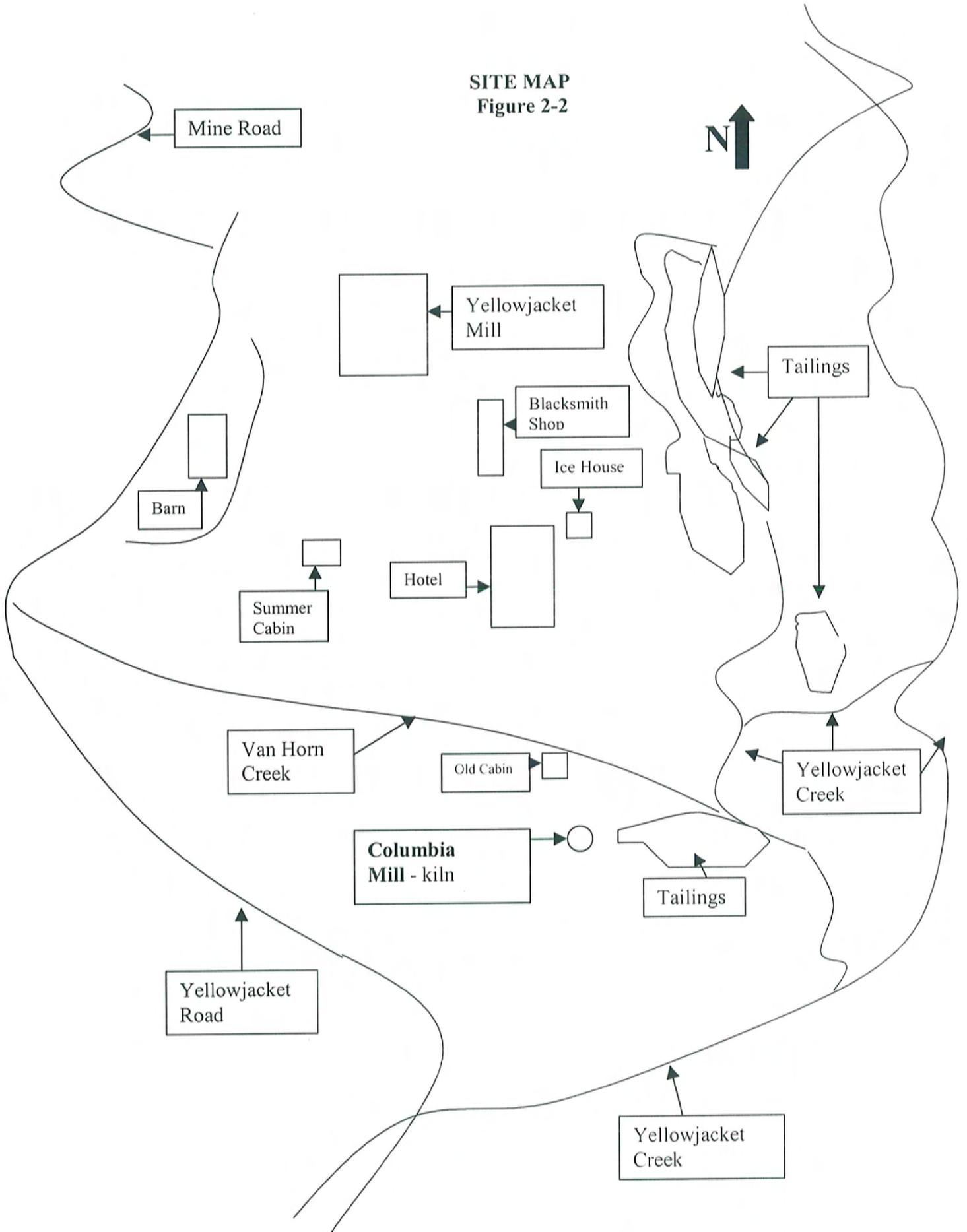


Mvc-009s

Mill ruins (upper center), cabin (tin roof), tailings pile (below Mill)
lie in Yellowjacket Creek, beaver dams in creek.

DEQ collected a composite soil sample from the tailings pile located adjacent to the creek (Appendix B). The creek appears to be eroding the old tailings, but discoloration of the water or creek bed is not evident.

SITE MAP
Figure 2-2



3.0 MIGRATION/EXPOSURE PATHWAYS AND TARGETS

The following sections describe migration/exposure pathways and potential targets within the site's range of influence (Figures 3-1 and 3-2). Receptors in the area have been identified as summer residents, hunters and occasional tourists.

3.1 GROUND WATER MIGRATION PATHWAY

The Mill lies approximately 20 feet above and adjacent to the westside of Yellowjacket Creek immediately south of the Van Horn Gulch tributary. The stratigraphy of the surrounding ridges, which include the Hoodoo Quartzite and Yellowjacket Formation, contributes to groundwater mobility.

The country rock is dark-gray quartzite containing calcareous beds belonging to the Yellowjacket Formation, a member of the Belt Group. The attitude of the beds varies markedly in different outcrops, but in general, strike west of north and dip northeast. A normal fault that may have considerable displacement passes a short distance west of the Yellowjacket mine strikes N. 30 ° E and dips northwest. The beds are crenulated, have numerous joints, and are probably broken by many smaller faults. Small dikes of granophyre, granite prophyry, kersantite, and other rocks are described as numerous in the workings. Most of the dikes are believed to be later than the mineralization, but some described as brecciated and altered, may be older (Ross, 1934).

Due to regional metamorphism and structure within the Yellowjacket Formation, primary porosity is expected to be very low with groundwater flow controlled by fractures, joints, faults and bedding-plane surfaces related to folding. In the absence of groundwater monitoring wells in the area, ground water is assumed to exist within fractures and joints in the bedrock and within the unconsolidated deposits. The Mill foundation rests upon unconsolidated poorly sorted sediments possibly glacial in nature.

No precipitation data is available for the Yellowjacket townsite. Therefore, precipitation data, maintained from 1951 through 1960, was used from the Blackbird Mine located 12 miles northeast and comparable in elevation to this site. The mean annual precipitation is 21.44 inches, and the 100-year, 24-hour event is 1.52 inches (WRCC, 2002).

There are not any drinking water or irrigation wells located within the 4-mile Target Distance Limit (TDL). The site is not located within a wellhead protection area (DEQ², 2002).

3.2 AIR MIGRATION PATHWAY

The nearest permanent individual residence to the Yellowjacket Mine is approximately 21 miles away in Cobalt, Idaho. There are two summer residences within a quarter mile of the Columbia Mill. The Middle Fork lookout tower, located approximately 4 miles southwest

of the site, is manned by one individual during the fire season which runs from June through October each year.

The site is comprised of unconsolidated alluvial material from the surrounding mountains and Yellowjacket Creek. Fine-grained tailings deposits remaining below the mill area exhibited a strong binding characteristic, and the surface appeared "gummy" to contact. The likelihood of aerial dispersal from the former tailings pile appears remote.

3.3 SOIL EXPOSURE PATHWAY

The Mill is easily accessible from the adjacent Yellowjacket Road, though trees generally obscure the site from view. The adjacent Yellowjacket Mill property is posted with "Private Property" and no trespassing signage, and a footbridge connects the two properties. The only apparent soils of concern (the old tailings) are located several hundred feet from the old town site and not an area tourists or hunters would frequent. There are no workers or residences within 200 feet of the site. No schools or day-care facilities are located within 200 feet of the site.

The DEQ collected a representative soil sample from the tailing (Appendix B). Total metals analysis indicated risk from levels of barium, cadmium, chromium, lead, selenium and silver are below 1×10^{-6} (or 1 in 1,000,000), conservatively assuming an industrial exposure scenario, and risk from mercury is approximately 4.2×10^{-5} , using the same exposure scenario (EPA, 2002). No visible staining or odoriferous soils were noted during DEQ inspections of the town site.

3.4 SURFACE WATER MIGRATION PATHWAY

There is no surface run-off in the proximity of the Mill or tailings. The only visible surface runoff is in the Van Horn Gulch drainage to the west of the town site. This drainage creates a small wetland west and south of the town site and enters Yellowjacket Creek approximately 100 feet north of the Mill. DEQ estimated the flow of the Van Horn Gulch tributary at approximately 100 gallons per minute.

Soil survey data for the site is unavailable, but direct observation suggests glacial till is an integral component. Direct observation revealed a coarse-grained sandy loam underlain by characteristic glacial debris. Based upon observation during the site visit, moderate to high infiltration rates would be expected.

Commercial and subsistence fishing are not conducted within the surface water Target Distance Limit (TDL). Sport fishing occurs on Yellowjacket Creek around the old town site and down stream. Fish catch data, however, could not be determined.

Bull trout (*Salvelinus Confluentus*), listed as a threatened species (FWS, 2002), are known to populate Yellowjacket Creek, Camas Creek and the Middle Fork of the Salmon River, and Chinook salmon (*Oncorhynchus (=salmo) Tshawytscha*) in Camas Creek and the Middle Fork of the Salmon River. All are located within the site's TDL. Wetlands within

the TDL are estimated at approximately 7.50 acres (DEQ¹, 2002). The wetlands are restricted to the Yellowjacket town site area.

The use of surface water for watering of livestock has not been verified. However, livestock grazing may be prohibited due to the Mill's proximity to Wilderness boundaries. Black bear, elk and deer were noted by direct observation. Despite direct observation of numerous beaver dams along Yellowjacket Creek, beaver population could not be verified.

There are no drinking water intakes within the TDL. Traversing south and southwest, the surface water pathway is enjoined by Little Jacket Creek at 3.9 miles, Hoodoo Creek at 4.9 miles, Lake Creek at 5.4 miles, Camp Creek at 5.65 miles, Jenny Creek at 6.15 miles, Buckhorn Creek at 6.65 miles, Jackass Creek at 8.4 miles, and several unnamed creeks before Camas Creek merges at 10.15 miles. Camas Creek continues within the 15-mile TDL for another 4.65 miles to the west where it enjoins the Middle Fork of the Salmon River at 14.9 miles from the site. The Middle Fork of the Salmon River continues within the 15-mile TDL for another 0.10 miles from the site.

One Probable Point of Entry (PPE) is the erosion of the tailings pile located by Yellowjacket Creek. Direct observation revealed the incising of the tailings by the creek. Though not observed, a second PPE could be runoff across the site into Yellowjacket Creek.

Fig 3-1 Columbia Mill Site 4-Mile Radius Map

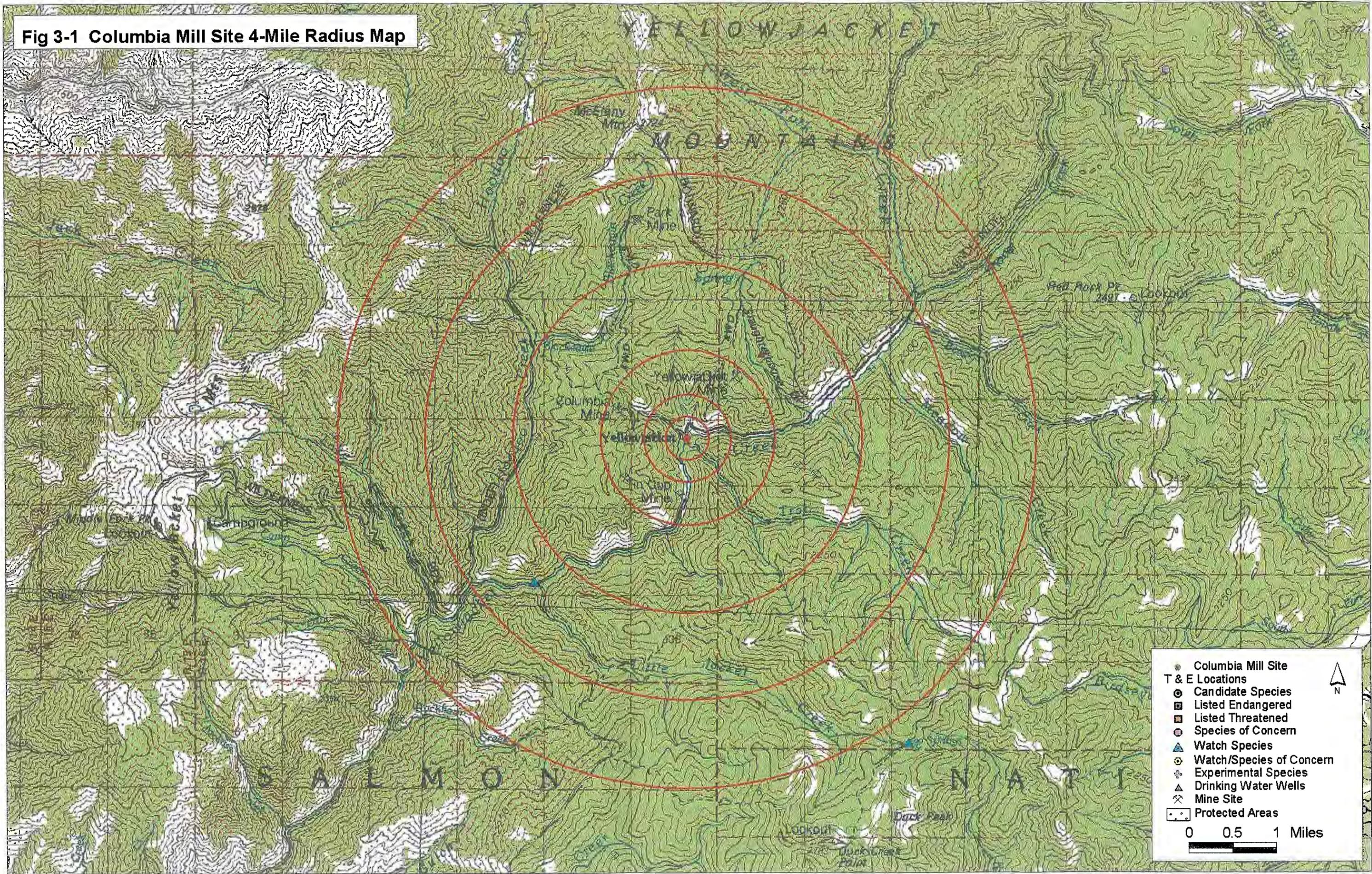
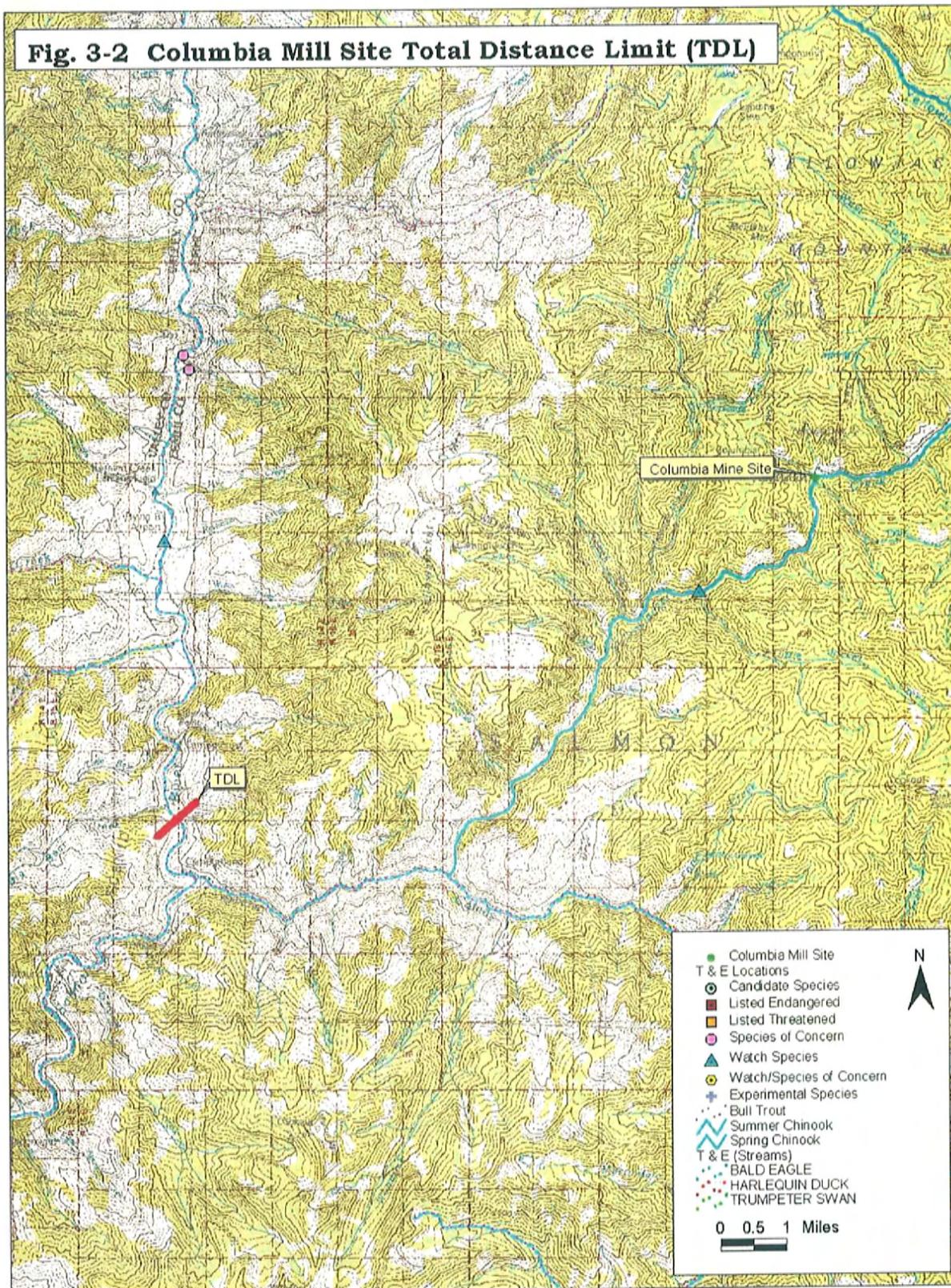


FIGURE 3-2



REFERENCES

- DEQ¹ (Department of Environmental Quality), 2002, Personal Communication from M. Jeffers, Technical Services Division.
- DEQ² (Department of Environmental Quality), 2002, Personal Communication from R. Taylor, Technical Services Division.
- Eldridge, G.H., 1895, A geological reconnaissance across Idaho: U.S. Geological Survey, 16th Annual Report, Part 2, pp. 262-264
- EPA (U.S. Environmental Protection Agency), 2002, Region 9 Preliminary Remediation Goals, <http://www.epa.gov/region09/waste/sfund/prg/files/02table.pdf>
- FWS (United States Fish and Wildlife Service), 2002.
<http://ecos.fws.gov/servlet/TESSWebpageVipListed?code=V&listings=0#E>
- IIM (Idaho Inspector of Mines), 1936 Annual Report on the Mining Industry of Idaho
- Ross, C. P., 1926 (August), U.S. Geological Survey, Photographs
- Ross, C. P., 1934, Geology and ore deposits of the Castro Quadrangle, Idaho: U.S. Geological Survey Bulletin 854, 135 p.
- Umpleby, J. B., 1913, Geology and ore deposits of Lemhi County, Idaho: U.S. Geological Survey Bulletin 528, 182 p.
- WRCC (Western Regional Climate Center), 2002.
<http://www.wrcc.dri.edu/htmlfiles/id/id.ppt.ext.html>

APPENDIX A

PHOTO LOG COLUMBIA MINE AND MILL

- CP0560 Reprint 1926, view to south, Mill building (left center), Yellowjacket hotel (center), blacksmith shop (lower left).
- Mvc-006s View to north, Mill ruins, kiln (center), cabin (right center), Yellowjacket hotel (far right).
- Mvc-009s View to south, Mill ruins (upper center), cabin (tin roof), tailings pile (below creek) lie within Yellowjacket Creek, beaver dams in creek.

APPENDIX B
ANALYTICAL DATA



IDAHO DEPARTMENT OF HEALTH & WELFARE

DIRK KEMPTHORNE - Governor
KARL B. KURTZ - Director

BUREAU OF LABORATORIES
RICHARD F. HUDSON, Ph.D., Chief
2220 Old Penitentiary Road
Boise, ID 83712
PHONE 208-334-2235
FAX 208-334-2382

Attention: Brian Gaber
Dept. of Env. Quality - Boise Regional Office
1445 N. Orchard Street
Boise, ID 83706-2239

Date Collected: 8/6/2002
Time Collected: 3:14 PM
Date/Time Received: 8/9/2002 2:00:24 PM

Lab Sample ID Number

02 08 168

(Please refer to this number when contacting the lab)

DEQB / 4814

Site: Yellow Jacket Creek

Collected By: Brian Gaber

Matrix: Soil

Sample ID: C-1

Type / Source:

Test	Method	Result	Units	Date Completed	Analyst
Arsenic, Total	EPA 7060A	12.2	mg/kg	8/19/2002	stranskyj
	Duplicate sample	11.8 mg/kg. Spike recovery = 86 %.			
Barium, Total	SM 3111D	22	mg/kg	8/22/2002	stranskyj
	Duplicate sample	22 mg/kg. Spike recovery = 88.5 %.			
Cadmium, Total	EPA 7130	<2	mg/kg	8/16/2002	stranskyj
	Duplicate sample	<2 mg/kg . Spike recovery = 86 %.			
Chromium, Total	SM 3111D	<15	mg/kg	8/22/2002	stranskyj
	Duplicate sample	< 15 mg/kg. Spike recovery = 100 %.			
Lead, Total	EPA 7420	227	mg/kg	8/16/2002	stranskyj
	Duplicate sample	242 mg/kg. Spike recovery = 98.6 %			
Mercury, Total	EPA 7471A	41.5	mg/kg	8/23/2002	stranskyj
	Duplicate sample	38.1 mg/kg.			
Selenium, Total	EPA 7740	<1.5	mg/kg	8/20/2002	stranskyj
	Duplicate sample	<1.5 mg/kg. Spike recovery = 94 %.			
Silver, Total	SM 3111B	<15	mg/kg	8/16/2002	stranskyj
	Duplicate sample	< 15 mg/kg. Spike recovery = 90.2 %			

RECEIVED

AUG 30 2002

DEPARTMENT OF ENVIRONMENTAL QUALITY
BOISE REGIONAL OFFICE

Laboratory Supervisor