



***Abandoned Mine Lands
Initial Investigation Report
San Poil Mine
Republic, Washington***

***Prepared for
Washington State
Department of Ecology***

***December 28, 2006
17274-00(SA)***



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Washington State
Department of Ecology
Rick Roeder, Project Manager**

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EXPIRES 12/03/2007

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**ABANDONED MINE LANDS INITIAL INVESTIGATION REPORT
 SAN POIL MINE
 REPUBLIC, WASHINGTON**

1.0 EXECUTIVE SUMMARY

Information obtained during this assessment is summarized in Table 1:

Table 1 - San Poil Mine Data Summary

Mine Name:	San Poil
Last Known Operation:	Current Claim/Land Owner: Hecla Mining Company. According to Huntting (1956), the mine was active in 1909-1921, 1931, and 1935. Two hundred tons of ore were produced prior to 1902.
Location:	1.4 miles north of Republic, Washington by road, in Ferry County. Latitude, Longitude: 48.6664, 118.755 Quadrangle Map: Storm King Mountain TRS: Township 37N, Range 32E, Section 34, NW 1/4, NE 1/4.
Features Observed	Building Foundations, Rail tracks
Results above Criteria	The sediment sample exceeds MTCA human health criteria for arsenic, and ecological criteria for arsenic, lead, mercury, selenium, silver, and zinc.
Work by Others	No previous site assessment information was identified.
Potential Receptors / Degree of Hazard	Human health risks possible for recreation users. Risk to ecological receptors is likely.

2.0 INTRODUCTION

This report summarizes the results of the initial soil and surface water investigation at the San Poil Mine site located near Republic, Washington (Figures 1 and 2). Hart Crowser performed this initial investigation for the Washington State Department of Ecology (Ecology) under Contract No. C06254 according to the Ecology Statement of Work (SOW) and project Sampling and Analysis Plan (SAP) prepared by Hart Crowser (Hart Crowser 2006).

The objectives of this initial investigation are to:

- Determine whether the site has released or has a potential to release hazardous substances to the environment at concentrations above Model

Toxics Control Act (MTCA) human health or ecological screening levels, to identify sites that may require additional investigation and sampling;

- Identify and document waste source areas including estimates of waste mass and/or volume; and
- Identify and document the presence of potential waste transport pathways and receptors.

For this study, samples were collected of the soil-like fraction of waste rock, mine tailings, and/or natural soils that was potentially affected by mining. Analytical results were compared to the MTCA criteria for soils. Use of terms such as “soils” or “waste rock”, etc. are for convenience only and do not indicate potential future designation in accordance with Chapter 173-350 WAC, or Chapter 173-303 WAC, or other regulatory criteria.

Subsurface openings observed for this study may include shafts, adits, prospect pits, collapsed stopes, and/or excavations completed for other purposes. The terms used in this report are based on visual interpretation in the field and may not fully characterize historic site use.

Prior to the site visit, Hart Crowser performed file reviews; evaluated aerial photographs, U.S. Forest Service and USGS maps; reviewed the Inventory of Washington Minerals; and reviewed county tax assessor records to:

- Identify the location of mines and associated features/structures;
- Identify property owners, mineral claimants, and mine operators; and
- Obtain contact information to gain permission for site access.

Table 2 presents the project team members and their roles and responsibilities for this investigation. A site visit was accomplished on August 30, 2006.

3.0 SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

3.1 Site Location

The San Poil Mine is located approximately 1.4 miles northwest of Republic, Washington, by road. Directions from Republic, Washington, to the San Poil Mine are as follows:

- Traveling north on Clark Avenue North turn left (west) on Klondike Road.

- After 200 feet Klondike road curves north and becomes Knob Hill Road.
- After 1.4 miles Knob Hill East Road will be on the right (east) and the San Poil Mine is on the left (west) (Photograph 1).

The roads are readily passable in a passenger car.

The access description provided herein is based on observations at the time the site was visited for this work. References to roads do not reflect property ownership, and does not imply that public access is available.

The San Poil Mine is located at latitude 48.6664 °, longitude 118.7550° (WGS 1984) in Township 37 N, Range 32 E, Section 34, NW 1/4, NE 1/4 (Willamette Meridian) at elevation 2,900 feet (USGS, 7.5 minute, Storm King Quadrangle, 1992) (Figure 2).

3.2 Site Description

The San Poil Mine is an inactive gold and silver mine in a valley (Eureka Gulch) west of Klondike Mountain (Figures 1 and 2). The last known date of operation was 1935 (Hunting 1935). The valley is occupied by Eureka Creek, which flows from north to south. The vertical relief is approximately 40 feet.

The site is located between the Knob Hill Road on the east, and the former railbed on the west (Figure 3). Photograph 2 and Figure 3 show the layout of the concrete foundations of mill buildings once occupying the site. The main floor is approximately 10 feet above Knob Hill Road.

The floor of the mill is waste rock (WR-3), dirt, and rounded rock. Small pines, up to 8 inches in diameter, have colonized it.

There are two waste rock piles south of the mill, WR-1 and WR-2, which may be of a later date. WR-1 is approximately 22 cubic yards in volume, and WR-2 is approximately 150 cubic yards in volume (Photograph 3). Both contain angular, coarse gravel to cobbles up to 10 inches. As previously mentioned, some waste rock also surrounded the mill foundations, WR-3, indicating waste rock may have been used for fill around the mill foundation.

A Property Map of the Republic Area (1958) indicates an adit and two buildings were located in the northern end of the site, and a Sanborn Fire Insurance Map (1908) indicated a mill called the San Poil Consolidated Co. Cyanide Plant was located at or near the site. No leach ponds were observed during our visit. We

located what appears to be the foundation of the mill but were unable to locate the former adit in the field.

The vegetation is forest, with pine, aspen, shrubs, and low herbs. We did not observe any evidence of vegetative distress.

The southeast section of the main floor of the mill appeared to be by the drainage pathway for the site (Photograph 4). There was evidence of minor surface soil transport toward the east, downhill, into the ditch at the base of the slope. The ditch drains south eventually intersecting Eureka Creek, which drains to the south into Granite Creek, and Granite Creek flows south into the San Poil River.

We did not observe any direct evidence of bats or hibernaculum.

3.3 Site Ownership and Operations History

Information on site ownership and operations is based on readily available public information and may not reflect all details of ownership and operations. An ownership timeline is shown in Table 3.

Table 3 – Ownership Timeline

Date	Ownership	Source
Current Claim/ Land Owner	Hecla Mining Co. (Parcel No. 23734900003000)	Ferry County Tax Assessor
1981	Day Mines acquired by Hecla Mining Co.	University of Idaho Manuscript No. 306
1951-?	Day Mines, Inc.	Huntting (1956)
1950	Aurum Mining Co.	Huntting (1956)
1933	Zwang, Ivan, and Co.	Huntting (1956)
1919	Trail Mining & Smelting Co.	Huntting (1956)
1918	Western Silica & Sand Co.	Huntting (1956)
1915-1922	West Hill Mining Co.	Huntting (1956)
1914-1915	Western Union Mines Co.	Huntting (1956)
1910-1918	San Poil Consolidated Mining Co.	Huntting (1956)
1896	San Poil located by Philip Creasor and Thomas Ryan.	Huntting (1956)

According to Umpleby (1910), “The property has been developed by some 2,500 feet of tunnels and drifts which explore the vein for about 1,000 feet along the strike and for 300 feet on the dip. Little stoping has been done.” He notes, “It is the southward extension of the Ben Hur vein, but has not proved as

productive as on that property.” Huntting (1956) says that it produced from 1909-1921, 1931, 1935, and 200 tons prior to 1902. The overlap of ownership noted in Huntting may indicate that the property was leased to and operated by various mining firms.

4.0 SITE INVESTIGATION ACTIVITIES

An initial site investigation was conducted on August 30, 2006. Photos were taken, and GPS coordinates and sediment samples were collected. Mining features and sample locations were sketched. No waste rock samples were collected because the waste rock was too coarse for analysis. One soil/sediment sample was collected on August 30, 2006, from the drainage at the southeastern corner of the mill. A sample description is given in Table 4. No surface water drainage or seeps were observed at the time of sampling. No groundwater wells were identified at or near the site. Photo locations and directions, GPS waypoints, sample locations, and the likely direction of surface water flows are shown on Figure 2.

No adits were identified during our investigation on this site. A former mill or loading facility was located that appears to correspond with a building shown adjacent to an adit on the mining claim map provided by Hecla Mining. According to Arnold Burbank, the Hecla Site Manager, half of the building was demolished and removed during re-alignment of the County Road.

4.1 Soil and Waste Pile Sampling

No soil or waste piles were sampled; the waste rock to the south had no perceptible fines.

4.2 Surface Water and Seep Sampling

No surface water or seeps were observed, therefore, no water samples were collected.

4.3 Sediment Sampling

Surface water appears to flow intermittently from the west to east along a drainage path in the southeastern corner of the mill site. The sediment was sampled where it approaches the mill main floor footing edge, and at the base of the footing. The sediment is described in Table 4 and the sample location is shown on Figure 3.

5.0 ANALYTICAL RESULTS AND ENVIRONMENTAL HAZARD ASSESSMENT

Soil and water quality data were compared to regulatory criteria for screening purposes as discussed below. Further analysis, including risk-based analyses may be appropriate in additional future site assessments.

5.1 Surface Water and Sediment

Soil/sediment analytical results are compared with applicable MTCA Method A cleanup levels, MTCA Method B cleanup levels for soil ingestion, soil ingestion and dermal contact combined, and with criteria for ecological protection of plants, soil biota, and wildlife. The arsenic concentration in sample SA-Sed1 exceeds MTCA human health and ecological criteria for arsenic. Concentrations of other metals in the sample also exceed the ecological criteria for lead, mercury, selenium, silver, and zinc.

5.2 Air

No airborne dust was observed while on site. However, based on the fine nature of the waste rock, contaminated airborne dust could be generated. Since there are no residences or cabins in the vicinity, this would only pose a risk to potential recreational users, occasional on-site workers and/or ecological receptors.

5.3 Methodology for Threatened and Endangered Species Information

We contacted the Washington State Department of Natural Resources (DNR), the Washington State Department of Fish and Wildlife (WDFW), the U.S. Fish and Wildlife Service (USFWS), and the Colville National Forest – USDA Forest Service to obtain information on the presence of state and federal threatened or endangered terrestrial and aquatic species. We determined that the WDFW maintained the most accurate and up-to-date information on species distribution in its Priority Habitats and Species (PHS) Database. We requested maps and narratives identifying documented species presence at the San Poil Mine. In addition, we contacted DNR and requested information on rare plants and high quality native wetland and terrestrial ecosystems within the vicinity of the San Poil Mine.

Our search ranges included a 4-mile radius for terrestrial species and a 15-mile radius for aquatic species.

We reviewed approximately 86 PHS maps and accompanying narratives to determine whether any threatened or endangered species were documented

within our search ranges. We drew 4- and 15-mile radii around the San Poil Mine on a Colville National Forest Map. We then examined the PHS maps in relation to the search ranges for our project areas. All state and federal threatened and endangered species and habitats that occurred within our search ranges were recorded. Species and habitats that occurred on the edge of our search range were considered within the range and recorded.

A summary of the threatened and endangered species within our search ranges is provided in Table 6.

6.0 SUMMARY AND CONCLUSIONS

The soil/sediment sample contains arsenic above human health criteria and other metals at concentrations above ecological screening criteria. The main contaminants of concern are arsenic, lead, mercury, selenium, silver, and zinc. The waste rock pile was not sampled due to its coarse constituents.

The primary exposure routes would be direct contact with the soil by potential recreational users, occasional on-site workers and ecological receptors. MTCA Method A and B screening levels may overestimate risk to recreational users since their exposure duration is less than the duration for a residential scenario. A site-specific terrestrial ecological evaluation (TEE) would be required to evaluate ecological risks.

Potential exposure pathways are shown on Figure 4.

7.0 USE OF THIS REPORT

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed, in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of the Washington department of Ecology for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

The information in this report is intended to be used to determine whether the site has released or has a potential to release hazardous substances to the environment at concentrations above Model Toxics Control Act (MTCA) human health or ecological screening levels.

8.0 REFERENCES

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Table 2 - Project Team Roles and Responsibilities

Project Role	Personnel Assignment	Roles/Responsibilities
Ecology Project Manager	Rick Roeder Ecology (509) 454-7837	Client Project Manager
Program Manager	Mike Bailey Hart Crowser (206) 324-9530	Ensures that all work is carried out in accordance with contractual obligations and the Delivery Order statement of work. Assists the Project Manager as needed with technical decisions and in resolving issues. Final reviewer.
Project/Task Manager	Roger McGinnis Hart Crowser (206) 324-9530	Overall responsibility for execution of the Work Plan. Coordinate with Client, Field Manager and Program Manager as necessary to resolve issues.
Corporate Health and Safety Officer (HSO)	Mike Ehlebracht Hart Crowser (206) 324-9530	Overall responsibility for review and answering questions regarding H&S.
Field Manager and Site Safety Coordinators (SSC)	Abby Bazin/Pat Reed Hart Crowser (206) 324-9530	Ensures that explorations are conducted and samples are collected in accordance with project specifications. Coordinates field activities with Project and Program Managers.
Mine Information Research	Pat Reed Mike Swenson Hart Crowser (206) 324-9530	Determined location of mine, access route, and ownership
Project Chemist	Erin Breckel Hart Crowser (206) 324-9530	Performs laboratory coordination and data quality review to assure analytical methods and data are consistent with project needs and data quality objectives.
Laboratory Services	Harvey Jacky Columbia Analytical Services (360) 577-7222	Analyzes soil, sediment, and water samples.

Table 4 - Republic Mine Sample Inventory

Sample Name	Sample Location	Sample Description
Soil/Sediment Sample		
SA-Sed 1	In intermittent drainage channel southeast of mill main floor.	Silty SAND with gravel (SM): 30 to 40 percent gravel, to 3/4-inch, angular; 50 to 60 percent sand, fine to coarse; 20 to 30 percent silt; tan, dry, loose, minor organics (pine needles), unsorted. [Fill].

Table 5 - Analytical Results for Soil Samples

Lab ID Sample ID Sampling Date	MTCA Method A (a)	MTCA Method B		Ecological Protection (c) Plant/Soil Biota/Wildlife	K0607754-033 San Poil-SP-Sed1 8/30/2006
		Soil Ingestion (b)	Soil Ingestion & Dermal Contact (b)		
Total Solids in %					98.1
Total Metals in mg/kg					
Antimony	--	32	29	5 / -- / --	1.39
Arsenic	20	0.67	0.62	10 ^d / 60 / 132	34.6
Beryllium	--	160	144	10 / -- / --	0.46
Cadmium	2	80	74	4 / 20 / 14	0.21
Chromium	2,000 ^e	120,000 ^e	44,571 ^e	42 / 42 / 67	18.8
Copper	--	2,960	2,700	100 / 50 / 217	11.6
Lead	250	--	--	50 / 500 / 118	78.4
Mercury	2	24	18	0.3 / 0.1 / 5.5	0.21
Nickel	--	1,600	1,441	30 / 200 / 980	9.31
Selenium	--	400	360	1 / 70 / 0.3	2.4
Silver	--	400	360	2 / -- / --	19.5
Thallium	--	5.6	5.0	1 / -- / --	0.11
Zinc	--	24,000	22,000	86 / 200 / 360	439

Notes:

U = Not detected at the detection limit indicated.

J = Estimated value.

-- Not established or Not applicable.

Bold - Concentration exceeds ecological criterion.

Box - Concentration exceeds MTCA Method A or Method B criterion.

(a) WAC 173-340-740(2), WAC 173-340-900 (Table 740-1). Model Toxics Control Act (MTCA) Method A.

(b) WAC 173-340-740(3). MTCA Method B Unrestricted land use soil cleanup standards. For carcinogenic constituents, the value presented is the lower of the non-carcinogenic and carcinogenic level calculated using Equations 740-1 and 740-2 for ingestion only. Equations 740-4 and 740-5 for ingestion and dermal contact. Information from CLARC 3.1 was used unless otherwise noted.

(c) WAC 173-340-740(3)(b)(ii), WAC 173-340-749, WAC 173-340-900 (Table 749-3).

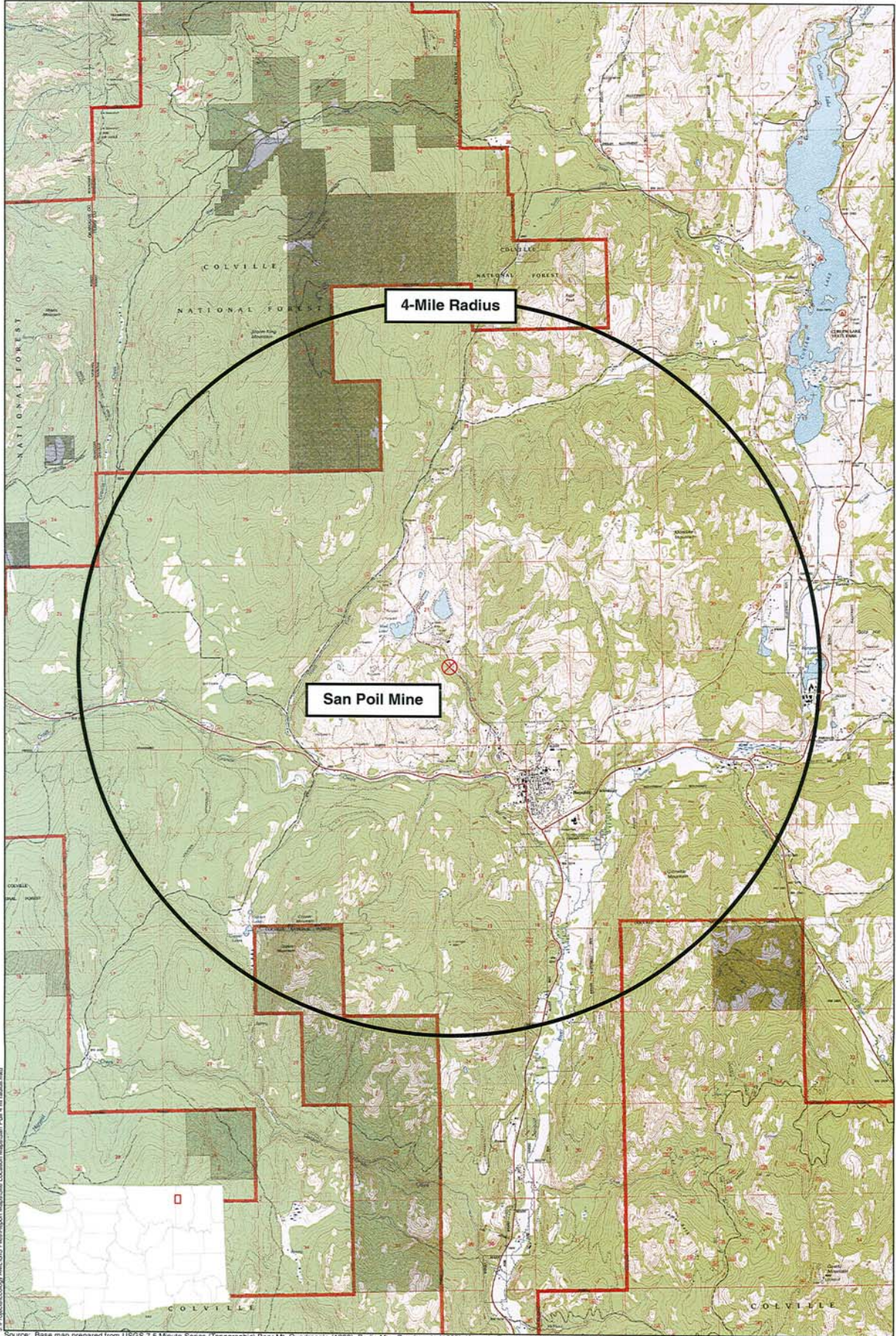
(d) Based on Arsenic V (10 mg/kg)

(e) Based on Chromium III

Table 6 - Threatened & Endangered Species

Species	Federal Status		State Status		Narrative
	T	E	T	E	
Bald eagle (<i>Haliaeetus leucocephalus</i>)	X		X		Southern portion of Curlew Lake

Site Location Map
San Poil Mine

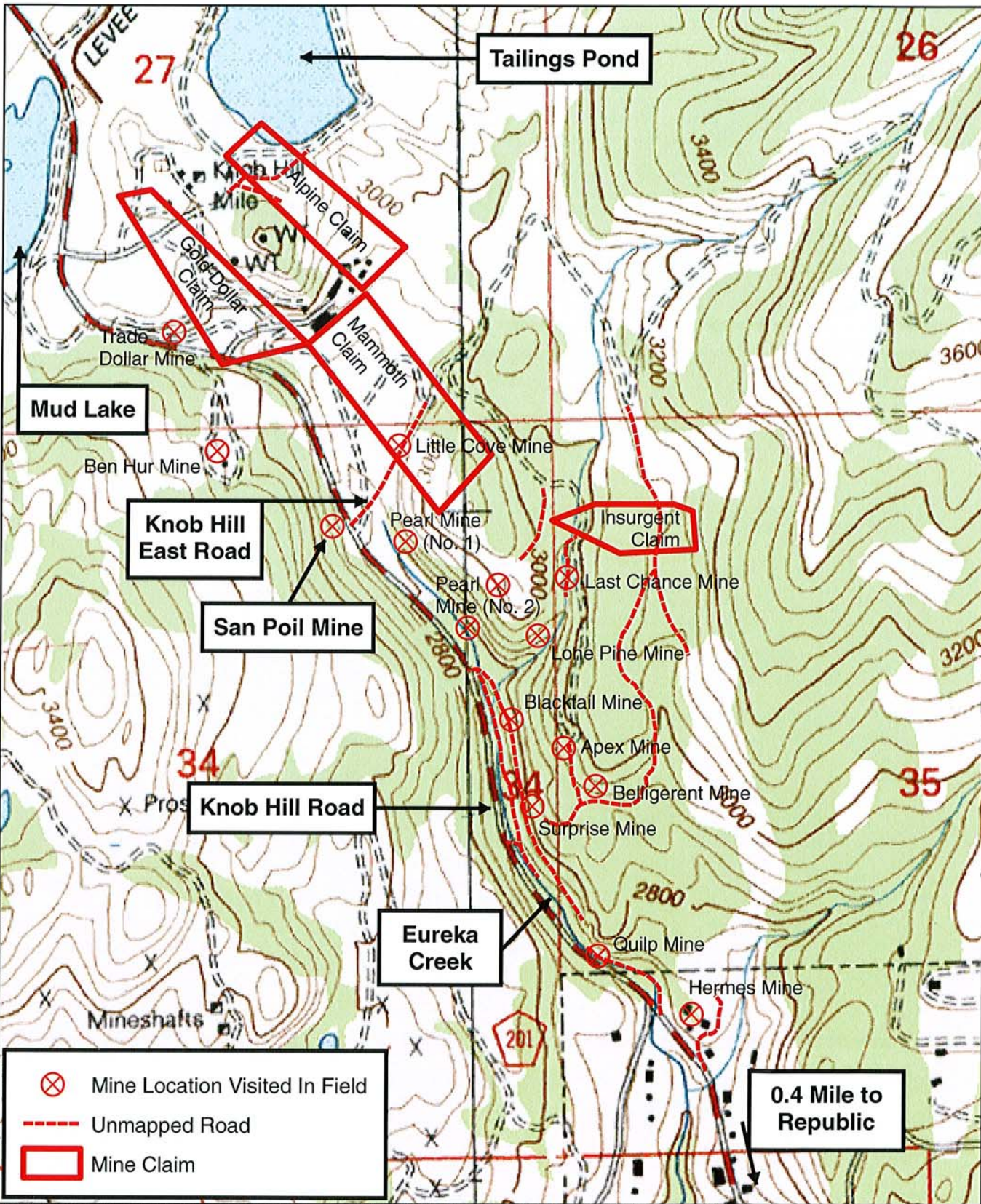


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Source: Base map prepared from USGS 7.5 Minute Series (topographic) Bear Mt. Quadrangle (1992), Bode Mtn. Quadrangle (1992), Karamin Quadrangle (1992), Republic Quadrangle (1992), Swan Lake Quadrangle (1992), and Storm King Mtn. (1992).



Vicinity Map San Poil Mine











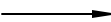
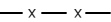






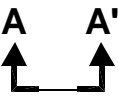


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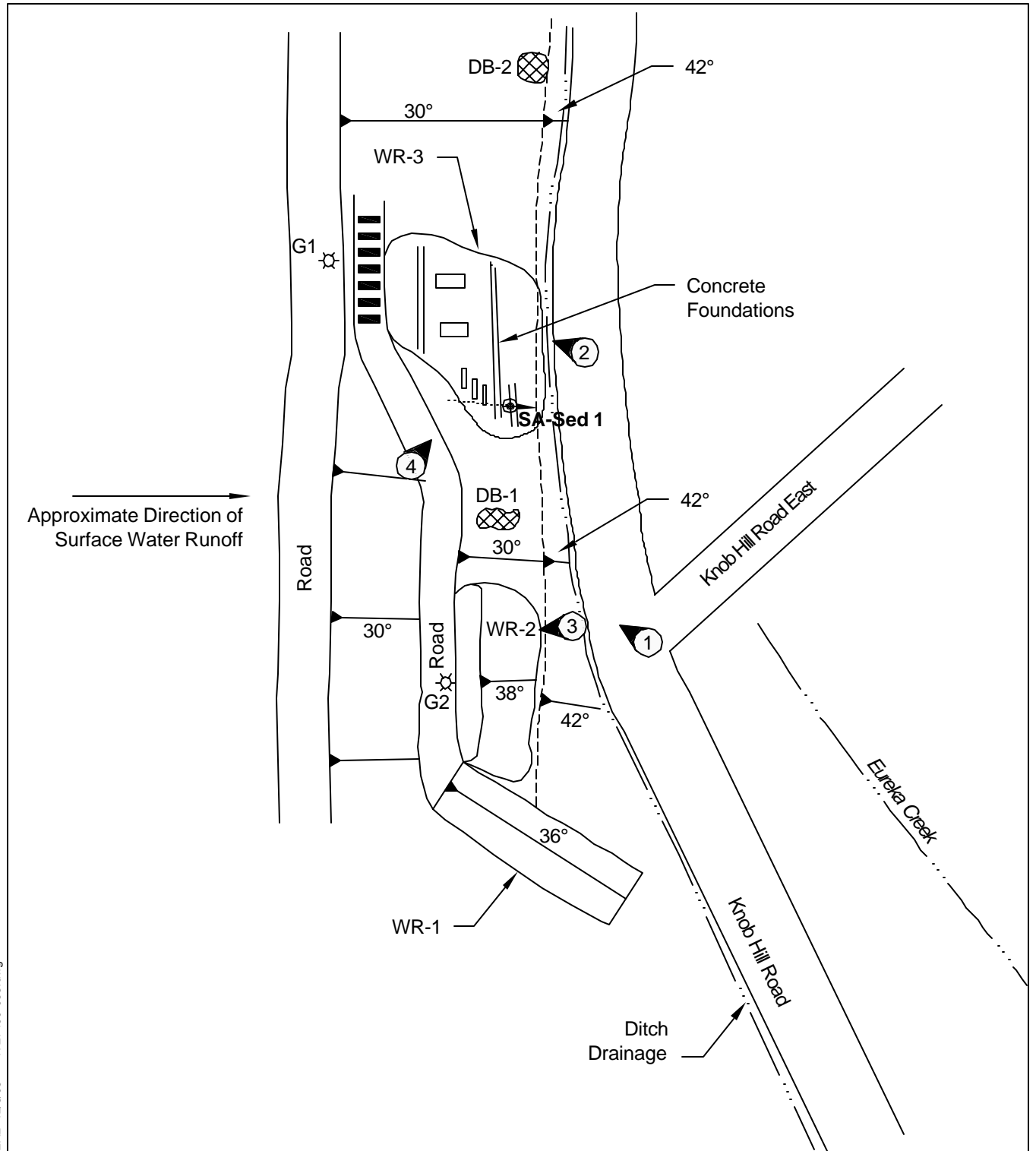


Standard Key for Site Plan

San Poil Mine

	GPS Data Point Location and Number
WR1-S2 	Soil or Waste Rock Sample Location and Number (Note: Site name prefix also part of sample number)
W1 	Water Sample Location and Number
45 	Composite Sediment Sample Location and Number
	Aduit
	Shaft
	Prospect/Pit
	Building/Structure
	Seep
	Drainage Channel
	Intermittent/Seasonal Drainage Channel
	Fence
	Debris, Predominantly Wood
	Debris, Predominantly Metal
	Soil or Seep Staining
	Other Feature
	Groundwater Well
	Photo Location, Number and Direction
	Approximate Cross Section Location and Designation

**Site Plan
San Poil Mine**



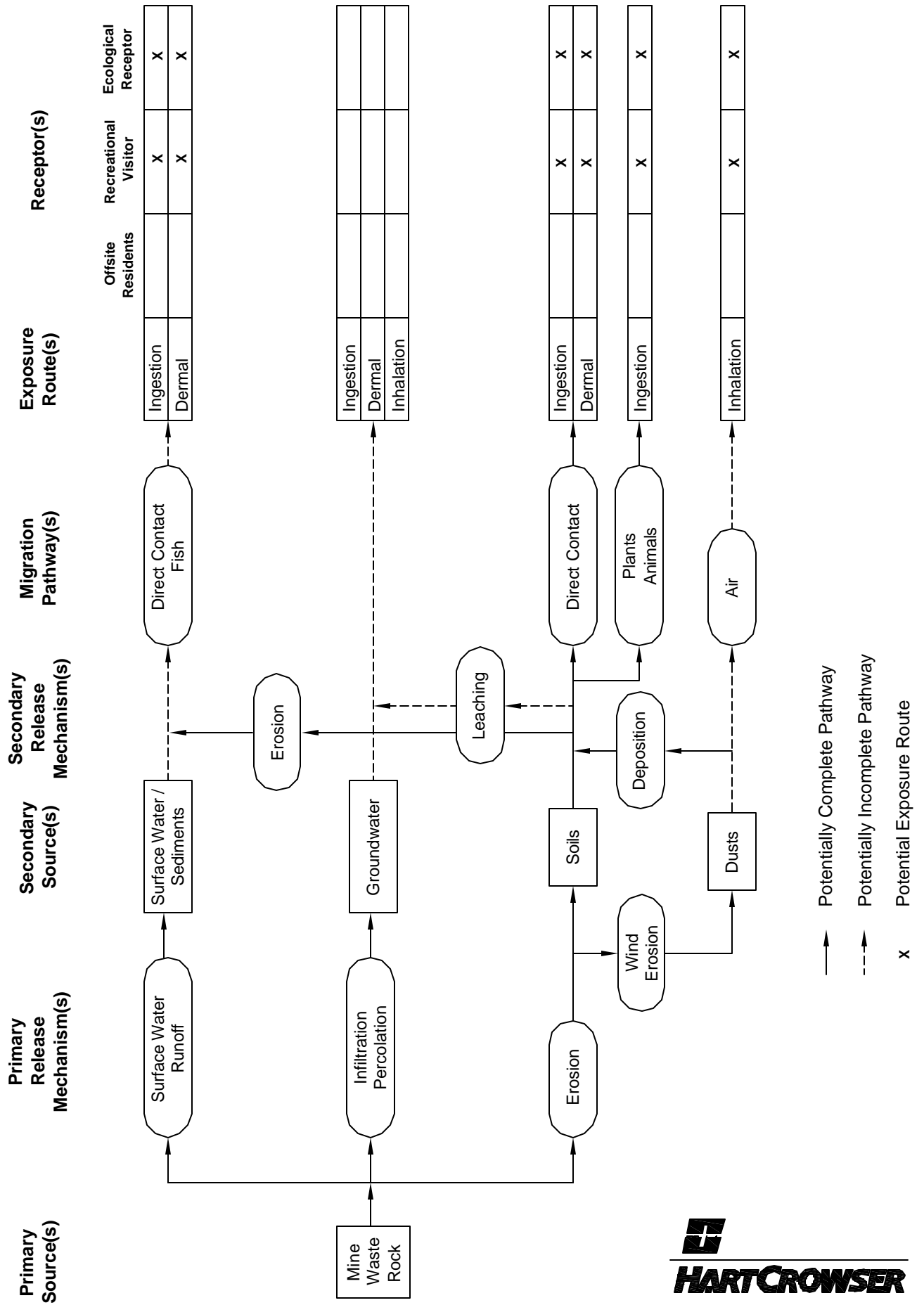
EAL 12/6/06 1727400-068.dwg

Source: Base map prepared from field notes dated 08/30/06.

0 50 100
Scale in Feet

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17274-00 (SA) 12/06
Figure 3

Mine Waste Rock Conceptual Site Model for Human and Ecological Risk San Poil Mine



**APPENDIX A
FIELD DOCUMENTATION**

AML Feature Inventory

Feature ID: San Pit
 Surveyor(s): MSS/PLR

USGS Quad:

Survey Date: 8-30-06

page 1

Directions to Site (from a main road or landmark appearing on map)

Par 60 Knob Hill Rd. E of Cross Street

3. Slope (if steep, report approx slope angle) variable see sketch

Terrain Slope (Circle where applicable): 1. Flat 2. Vertical

Physical Features / Sources

Mine Openings: shaft(s) pit(s) other (explain)

Physical Features / Sources: Open / closed / collapsed / flooded Nominal Dimensions in feet Water Present Other (explain)

Designated Type / Control ID: W-1 W-2 W-3

Dimensions in ft: 5 x 10 x 8 38 38 7.5 x 8

Depth: 0.5 1.5 1.5

Material: sketch sketch sketch

Notes: No evidence of AAT on road on map was found PLR notes

Other (explain): see sketch

GPS: 1278965, 479885

Photo # Bulle - P3 - B15

Site Description: Adit on northeast side of WR-2

Estimated Particle Size: 0.5" - 4"

Sample Name(s): Bulle - WR1 - S154

Soil Description: moist, gray, silty, v. sandy, gravel

Soil Classification: gray cobbles

Notes: gray cobbles 1 g-lay cobbles

Other (explain): see PLR notes

Sample Inventory

Sample Name: WR1-S1

Location: Southern end of WR-1, top

GPS Name: Bulle - WR1 - S1

Nothing/Empty: Nothing/Empty

GPS: 1278965, 479821

Soil Description: moist, gray, silty, v. gravelly, sand

Soil Classification: see PLR notes

Timbers charred in place & sawed found randomly in WR-2
 Potential w/ around F-1 (fire-stuff)
 pos. w/ around the mill foundations appears to be the same material from the natural slope face N
 unless entire embankment is fill

AML Feature Inventory

Feature ID San Pit
 Surveyor(s) MIS & PIR

Survey Date 8-30-06

Physical Features / Sources (Continued)

Mining Activity-Related Ponds or Liquid Containment Structures:

leach pond(s) tailings pond(s) tailings impoundment(s) other (explain)

None

Pond Type / Count ID	Dimensions in ft (L x W x D)	Lined (Y/N)	Liquid Present (Y/N)	PH	Parameters:		Animals Present (e.g. bats, other)	Sample Name(s)	GPS
					Cond in mS	Temp in C			
(i.e.) LP 1	50 x 30 x 4	N	N				N	Butte - LP1 - S1-S2	GS: 1278985, 478985

Seep(s) Creek(s) Pond(s) Lake(s) *None*

Type / Count ID	Location	Sample Name	Flowrate in GPM	PH	Cond in mS	Temp in C	Color	Notes
(i.e.) Flume Creek	GS: 1278498, 478985 southern site border	Butte - Flume Creek 1	0.1	6.2	0.153	10.9		

Soil Staining Seep Staining *None*

Type / Count ID	Location	Color	Distance from Potential Contaminant Source to Receptor	Source & Receptor	Notes
(i.e.) Stain 1	soil downslope of Adit 1	orange/brown	100' upslope of Flume Creek	fish	ferricrete-like

Seasonal Flow Paths or Channels

Count / ID	Water Present (Y/N)	Sample Name	GPS	Parameters:		Distance from Potential Contaminant Source to Receptor	Source & Receptor
				Flowrate in GPM	Temp in C		
(i.e.) Drainage 1	N	Butte - Sed 1	G1: 1278645, 478985				
		<i>See field notes</i>					discharges into Flume Creek fish

Wetlands *None*

Count / ID	GPS	Flowrate in GPM	PH	Cond in mS	Temp in C	Distance from Potential Contaminant Source to Receptor	Source & Receptor
(i.e.) Wetland 1	GT: 127856, 478985		5.9	0.2	12.1	None	

Ecology AML

San Poil				
Point	Coordinate Name	Northing	Easting	Altitude
G1	SAN POIL MILL 1	1220480	2062305	2865
G2	SAN POIL WR 1	1220368	2062359	2863
	Average	1220424	2062332	2864

Notes:

Northings and Eastings are reported in units of US Feet, relative to NAD 83 State Plane Coordinate System, Washington Zone South.



Photograph 1 - View of San Poil Mine from Knob Hill Road East, looking northwest.



Photograph 2 - View of concrete foundations of former mill buildings.



Photograph 3 - View of WR-2.



Photograph 4 - View of seasonal drainage area in southeastern corner of the site (below boulders).