Abandoned Mine Lands
Initial Investigation Report
McNally Mine
Orient, Washington

Prepared for
Washington State
Department of Ecology

December 28, 2006
17274-00(MC)

Colville NF

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Rick Roeder, Project Manager

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Prepared by
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Tables with no page number shown are included following page 8.

ABANDONED MINE LANDS INITIAL INVESTIGATION REPORT
MCNALLY MINE
ORIENT, WASHINGTON

1.0 EXECUTIVE SUMMARY

Information obtained during this assessment is summarized in Table 1.

Table 1 – McNally Mine Data Summary

Mine Name:	McNally Mine (Pelkey & Dille, Regina)
Last Known Operation:	According to Huntting (1956) the last date of the mine's operation was 1938 and it consisted of several claims. Development included a 330-foot adit, a 250-foot adit, several shorter adits, a 75-foot shaft, and several open cuts totaling about 1,000 feet. Copper, gold, silver, and lead were produced.
Location:	6 miles east of Rockcut, Washington, by road. Stevens County Latitude/Longitude: 48.925, 118.104. Quad Map: Churchill Mtn. and Laurier Quadrangles TRS: Township 40N, Range 37E, Section 34
Features Observed	One Waste Rock Pile (2,400 cubic yards) One adit Two pits
Results above Criteria	The soil and sediment samples both exceeded human health criteria for arsenic and one sample exceeded human health criteria for iron. One sample exceeded MTCA criteria for protection of ecological receptors, and both samples exceeded MTCA screening criteria for ecological receptors for chromium, copper, mercury, and nickel.
Work by Others	No previous site assessment information was identified.
Potential Receptors / Degree of Hazard	Concentrations of several metals exceed MTCA criteria for human health or ecological protection. The proximity of Pierre Creek makes migration to surface water likely. No homes or occupied cabins were observed in the vicinity. The nearest dwelling is approximately 1.4 miles west of the site.

Table 2 presents the project team members and their roles and responsibilities for this investigation. A site visit was accomplished on July 14, 2006.

3.0 SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

3.1 Site Location

The McNally Mine is located in the Colville National Forest (Figure 1). Directions to the mine are as follows:

- From Kettle Falls, head north on Highway 395, through Orient, Washington.
- Turn right on Rockcut Road.
- At 0.3 mile stay straight onto Sand Creek Road.
- Turn right at the fork at 1.2 miles.
- At 1.5 miles, stay on the main gravel road, toward the right.
- At 4.0 miles, turn left on Churchill Mine Road. Take an immediate right at the fork.
- Cross a cattle guard at 4.4 miles.
- Take a hard right at the five-way intersection encountered at 5.4 miles.
- Approach a fork at 6.2 miles. Stay left.
- Cross cattle guard at 6.3 miles and park.
- Climb down the steep hillside to the north, toward Pierre Creek.

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 site is located on Steven's County Parcel Nos. 8008737 and 1754700.

4.1 Soil and Waste Pile Sampling

One waste rock sample, McNally-WR1-S1, was collected during a site visit on July 14, 2006. The sample is a moist, light gray, slightly silty, sandy Gravel with cobbles. The sample location is shown on Figure 3.

4.2 Surface Water and Seep Sampling

A small amount of ponded surface water was observed in the drainage channel exiting the adit. However, the volume was too small to sample and, therefore, a sediment sample was collected from the drainage channel.

4.3 Sediment Sampling

A five-point composite sediment sample was collected from the drainage channel exiting the adit. The channel extends from the adit, through the prospect, and across the top of the waste rock pile before disappearing. Water either infiltrates or spreads out so as to no longer form a channel. It is likely that the channel contains flowing water during wet weather.

5.0 ANALYTICAL RESULTS AND ENVIRONMENTAL HAZARD ASSESSMENT

The nearest surface water is Pierre Creek, which drains into Pierre Lake. The creek abuts the site and may come in direct contact with the waste rock during periods of high flow. No residences or cabins were observed in the vicinity, but the Churchill Mtn. and Laurier Quadrangle Maps indicate that buildings are located along the access road, about 1.4 miles from the site.

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

Concentrations of arsenic and iron in the sediment sample exceeded MTCA Method B criteria. The arsenic concentration was below the Method A criterion for Human Health. The sediment sample also exceeded ecological protection criteria for aluminum, chromium, copper, mercury, and nickel.

Water sampling was not accomplished.

A summary of the threatened and endangered species within our search ranges is provided in Table 5.

6.0 SUMMARY AND CONCLUSIONS

The McNally Mine site has one adit, two pits, and a waste rock pile totaling 2,400 cubic yards that may exceed MTCA Method B or ecological protection criteria. The main constituents of concern are arsenic, chromium, copper, mercury, and nickel. Some waste rock may also exceed the applicable criteria for aluminum and iron. Risks to human health are most likely limited to direct contact and incidental ingestion by potential recreational users. MTCA Method A and B Screening Criteria may over estimate risk to recreational users since their exposure during is less than the duration at a residential scenario. Sediment in an ephemeral drainage channel that extends across the waste rock dump from the adit exceeds ecological protection criteria. Because the waste rock pile abuts the creek, surface water may be impacted. A site-specific terrestrial ecological evaluation (TEE) would be required to evaluate ecological risks.

We recommend revisiting the Site to collect a water sample when adit drainage is occurring.

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 State 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.

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 - Analytical Results for Soil and Sediment Samples - McNally Mine

SDG Sample ID Sampling Date	MTCA Method A (a)	MTCA Method B		Ecological Protection (c) Plant/Soil Biota/Wildlife	K0606045 McNally-Sed 1 7/14/2006	K0606045 McNally-WR1-S1 7/14/2006
		Soil Ingestion (b)	Soil Ingestion & Dermal Contact (b)			
Total Solids in %					54.6	95.1
Total Metals in mg/kg						
Aluminum	--	80,000	72,072	50 / -- / --	**14,800**	
Antimony	--	32	29	5 / -- / --	0.21	0.07 J
Arsenic	20	0.67	0.62	10[(d)] / 60 / 132	5.6	3.3
Beryllium	--	160	144	10 / -- / --	0.31	1.23
Cadmium	2	80	74	4 / 20 / 14	0.32	0.3
Chromium	2,000[e]	120,000[e]	44,571[e]	42 / 42 / 67	**50.4**	**89.8**
Copper	--	2,960	2,700	100 / 50 / 217	**113**	**726**
Iron	--	24,000	21,622	-- / -- / --	27,500	
Lead	250	--	--	50 / 500 / 118	10.3	18.8
Manganese	--	11,200	10,090	1,100 / -- / 1,500	411	
Mercury	2	24	18	0.3 / 0.1 / 5.5	**0.26** J	**0.81** J
Nickel	--	1,600	1,441	30 / 200 / 980	**83**	**71.4**
Selenium	--	400	360	1 / 70 / 0.3	2.1 U	2.1 U
Silver	--	400	360	2 / -- / --	0.1	0.43
Thallium	--	5.6	5.0	1 / -- / --	0.11	0.13
Zinc	--	24,000	22,000	86 / 200 / 360	57.7	58.5

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.

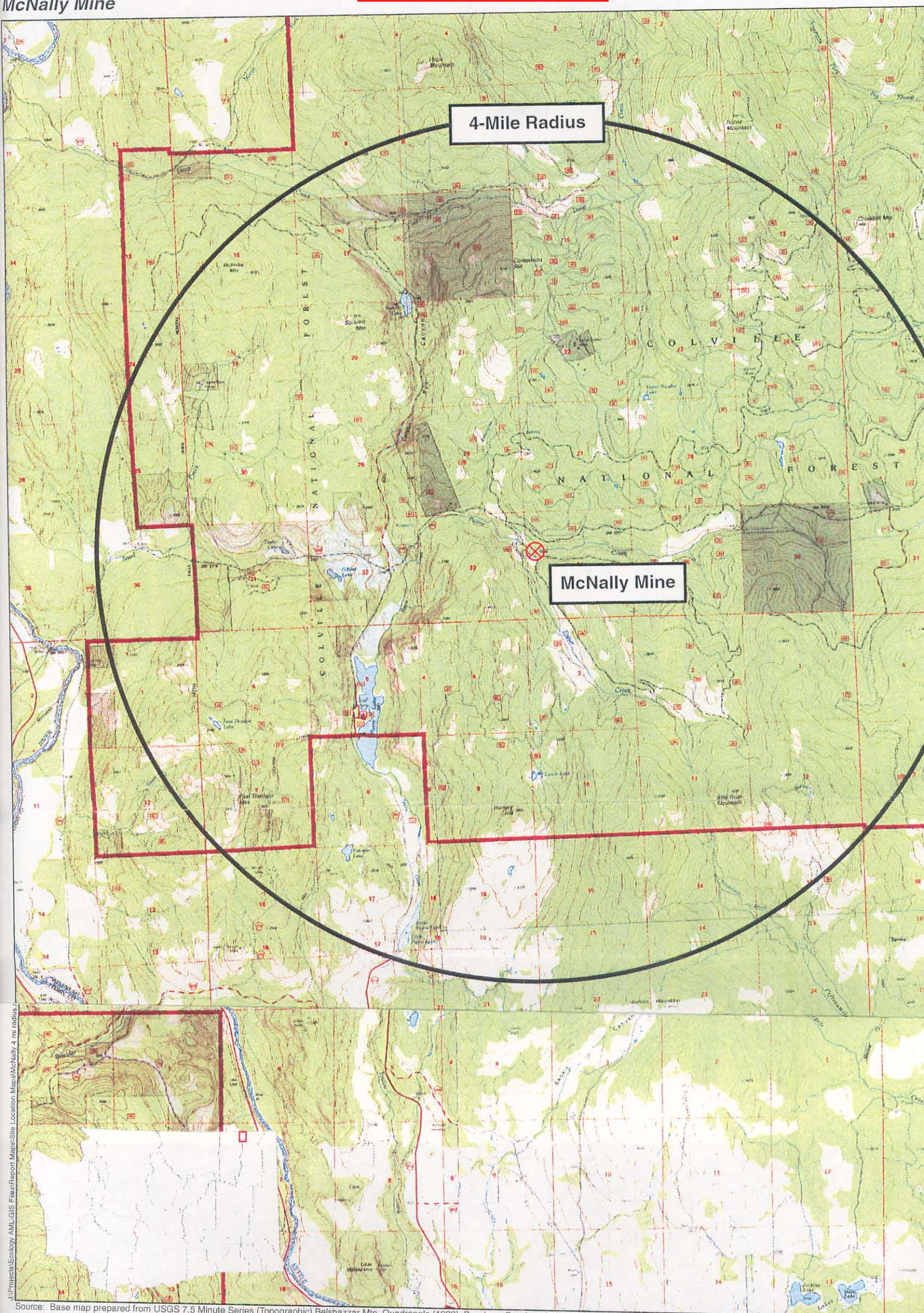
(c) WAC 173-340-740(3)(b)(ii), WAC 173-340-749, WAC 173-340-900 (Table 749-3).

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

(e) Based on Chromium III

Site Location Map
McNally Mine

Figure 1



J:\Projects\Ecology AML\GIS Files\Report Maps\Site Location Maps\McNally 4 mi radius.mxd

Source: Base map prepared from USGS 7.5 Minute Series (Topographic) Belshazzar Mtn. Quadrangle (1992), Bossburg Quadrangle (1969), Churchill Mtn. Quadrangle (1992), Laurier Quadrangle (1992), Orient Quadrangle (1

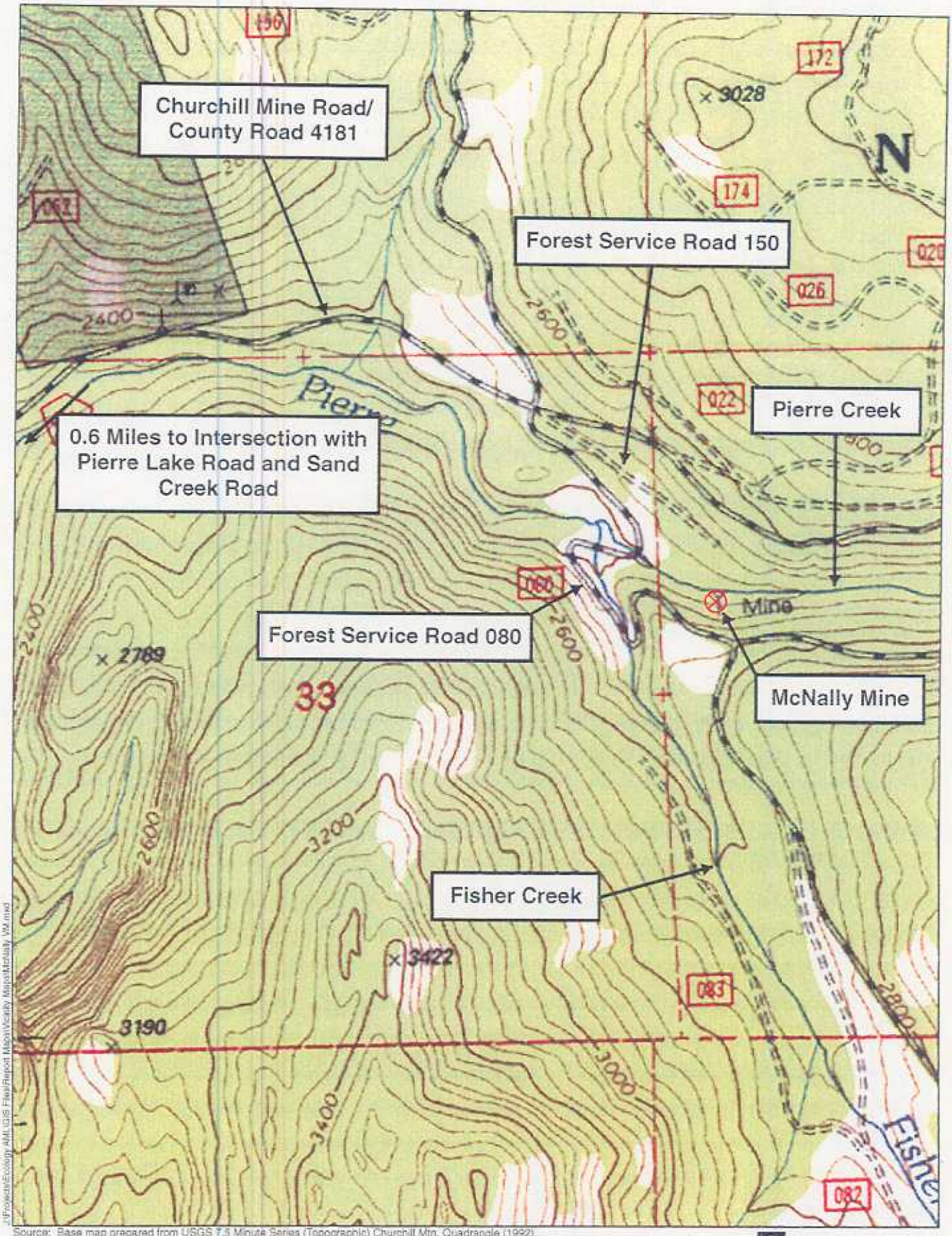
0 0.5 1 2

Scale in Miles

N

HA
172
Figu

Vicinity Map
McNally Mine



Source: Base map prepared from USGS 7.5 Minute Series (Topographic) Churchill Mtn. Quadrangle (1992).

0 500 1,000
Scale in Feet

⊗ Mine Location Visited in Field

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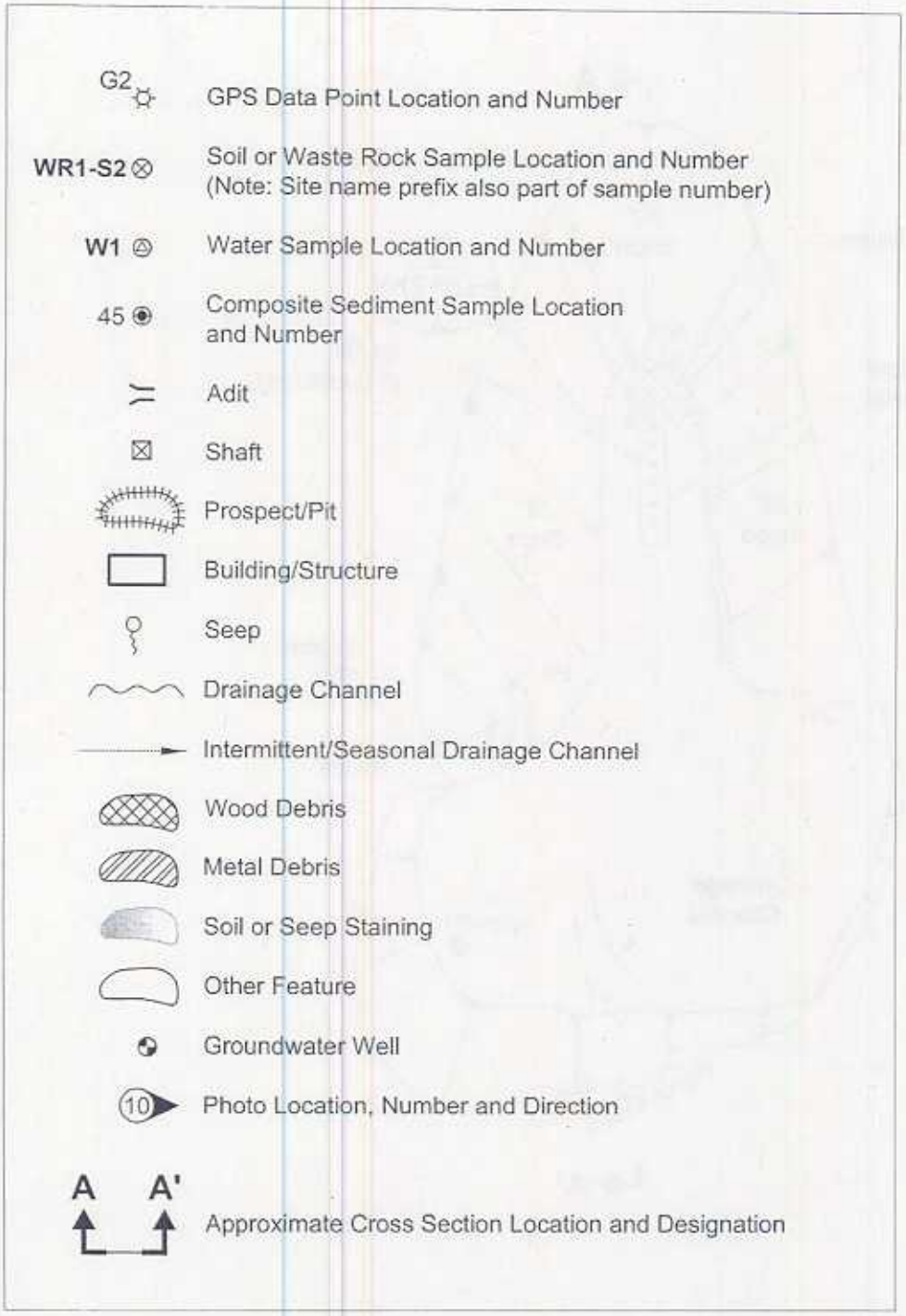
Figure 2

J:\Projects\Ecology AML\GIS Files\Report Maps\Vicinity Maps\McNally VM.mxd

Standard Key for Site Plan
McNally Mine



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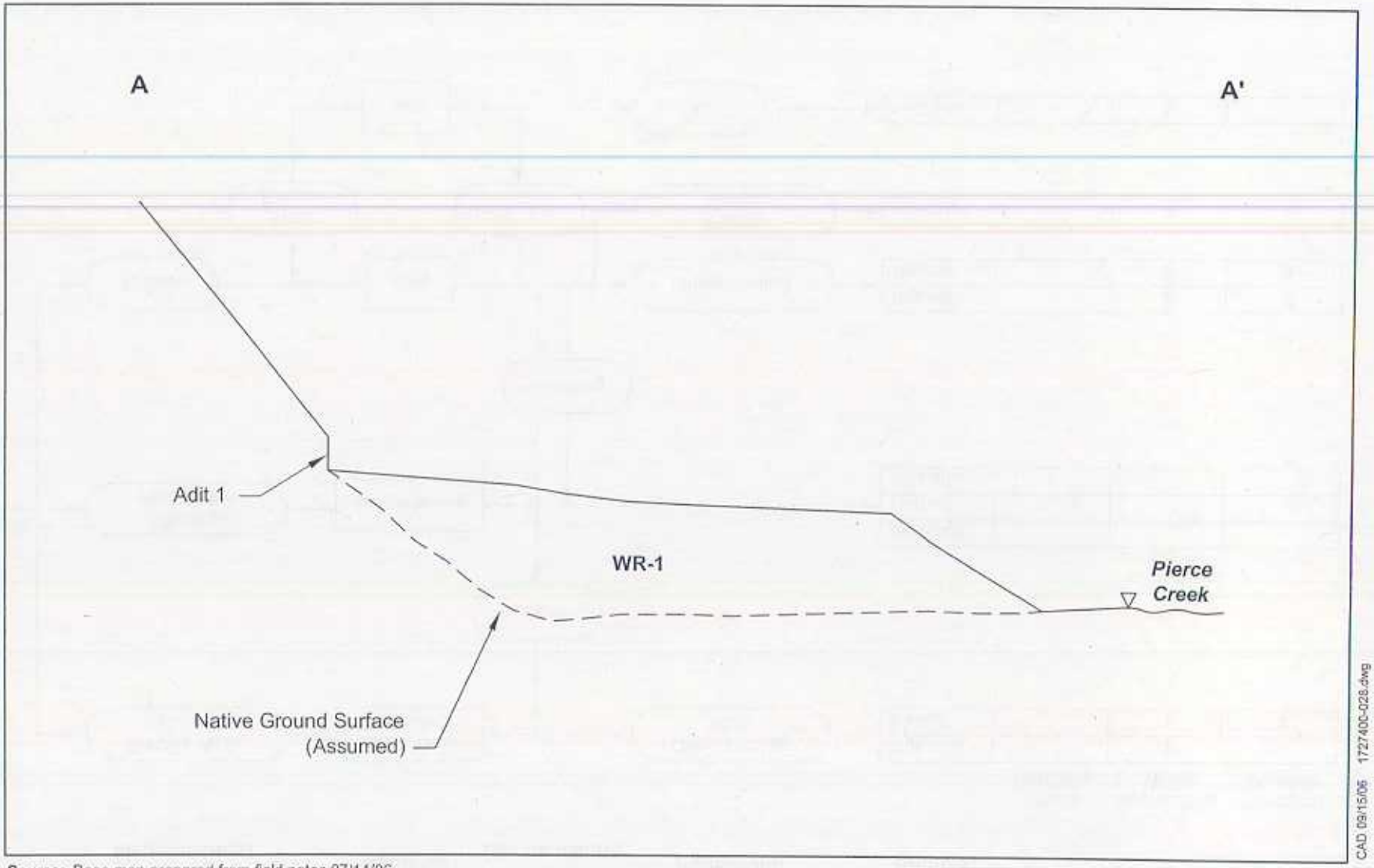
Cross Section A-A'

McNally Mine



Source: Base map prepared from field notes 07/14/06

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Figure 4

AML Feature Inventory

Feature ID: McNally
Surveyor(s): ASR, MJS

USGS Quad: Churchill Mtn & Laurier

Survey Date: 7/19/06

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

Terrain Slope (Circle where applicable): 1. Flat 2. Vertical 3. Sloped (if sloped, report approx slope angle)
slope angle: deg

Physical Features / Sources

Mine Openings: ☐ shaft(s) ☒ adit(s) ☒ pit(s) ☐ other (explain)

Opening Type / Count ID	Open / closed / collapsed / flooded / other?	Nominal Dimensions in feet	Water Present (Y / N)	Flowrate in GPM	Parameters: pH	Cond in mS	Temp in C		Animals Present (ie: bats, other)	Photo # Photo# Date	(Site-	GPS	Description
(i.e.) Adit 1	open	5 x 10 x 8	Y	0.5 L/min	3.4	0.254	14.7		n	Butte - P3 - 6/15		G7: 1278956, 476985	Adit on northeast side of WR-2
pit 1	caved	sketch	N	N									filled. may be a shaft
adit 1	covered	sketch	N	N									collapsed/covered w/ logs & debris

*Elevation Measurement Method: B=barometer, T = Topo Map, O = Other (explain)

Mining Activity-Related Piles: ☐ waste rock pile(s) ☐ tailings pile(s) ☐ ore / leach pile(s) ☐ debris pile(s) ☐ other (explain)

Pile Type / Count ID	Dimensions in ft (L X W X H)	Slope in degrees	Seepage Visible? (Y / N)	Seepage: Active / Inactive?	% Vegetative Cover (trees / brush / grass, moss)	Distressed Vegetation (Y / N)	Recent Human Activity (Y / N)	GPS	Sample Name(s)	Estimated Particle Gradation	Soils Classification
(i.e.) WR-1	150 x 50 x 3	38	Y	inactive	20% / 30% / 15%	N	bottles, footprints	G1:04 (see below)	Butte - WR1 - S1:S4	0.5" - 4"	moist, gray, sl silty, v sandy, Gravel
WR2-1	sketch	sketch	N	—	70/90/100	N	0.1 can (-1)		McNally - WR1-S1		

Sample Inventory

Sample Name (Site - Feature - Sample Number)	Location	GPS Name	Northing/Easting	Soil Description	Sieved?
(i.e.) Butte - WR1-S1					
McNally - WR1 - S1	Southern end of WR-1, top, toe of WR-1 near river	G9: Butte - WR1 - S1	G7: 1278965, 4796821	moist, gray, silty, v. gravelly, Sand	Y, ASTM #10
McNally - S1 - S1	@ adit drainage				N

Miscellaneous Notes:

AML Feature Inventory

Feature ID: McNally

Survey Date: 7/14

Surveyor(s): ASB, MJS

Physical Features / Sources (Continued)

Water Supply Structures: ☐ GW Well(s) ☐ SW Intake(s) ☐ Pit Toilet(s) ☐ Other (explain)

Type / ID	Inner Diameter	Depth	Soil Type	Population Served	Distance from Potential Contaminant Source	GPS	General Location
Ø							

	Mill Present (Y / N)	Mill Footprint in ft ²	Waste Associated with Mill	Chemicals Assoc with Mill	GPS
Mill	N				

Buildings / Structures

	Count / ID	Bldg. Footprint in ft ²	Suspected Bldg. Use	Bldg. Condition	GPS	Comments
Other Buildings	N					

Liquid or Waste Containment Structures: ☐ drum(s) ☐ tank(s) ☐ other (explain)

Type / ID	Coun	Volume in Gal	Condition	Suspected Contents
(a) drums	1	55	dry, rusted, no lid	unkwn
Oil can	1	3	no lid paint still intact	motor oil

Debris / Refuse: ☐ assay equip & retorts ☐ drum(s) ☐ scrap lumber ☐ scrap metal ☐ machinery ☐ other (explain)

Type/ ID	Number	Size	Location	Description
(a) scrap lumber & metal		5' x 10' x 1'	top of mill	timbers (some charred), rails, stakes, and sheet metal
Wood/metal debris			in front of adit	logs & branches

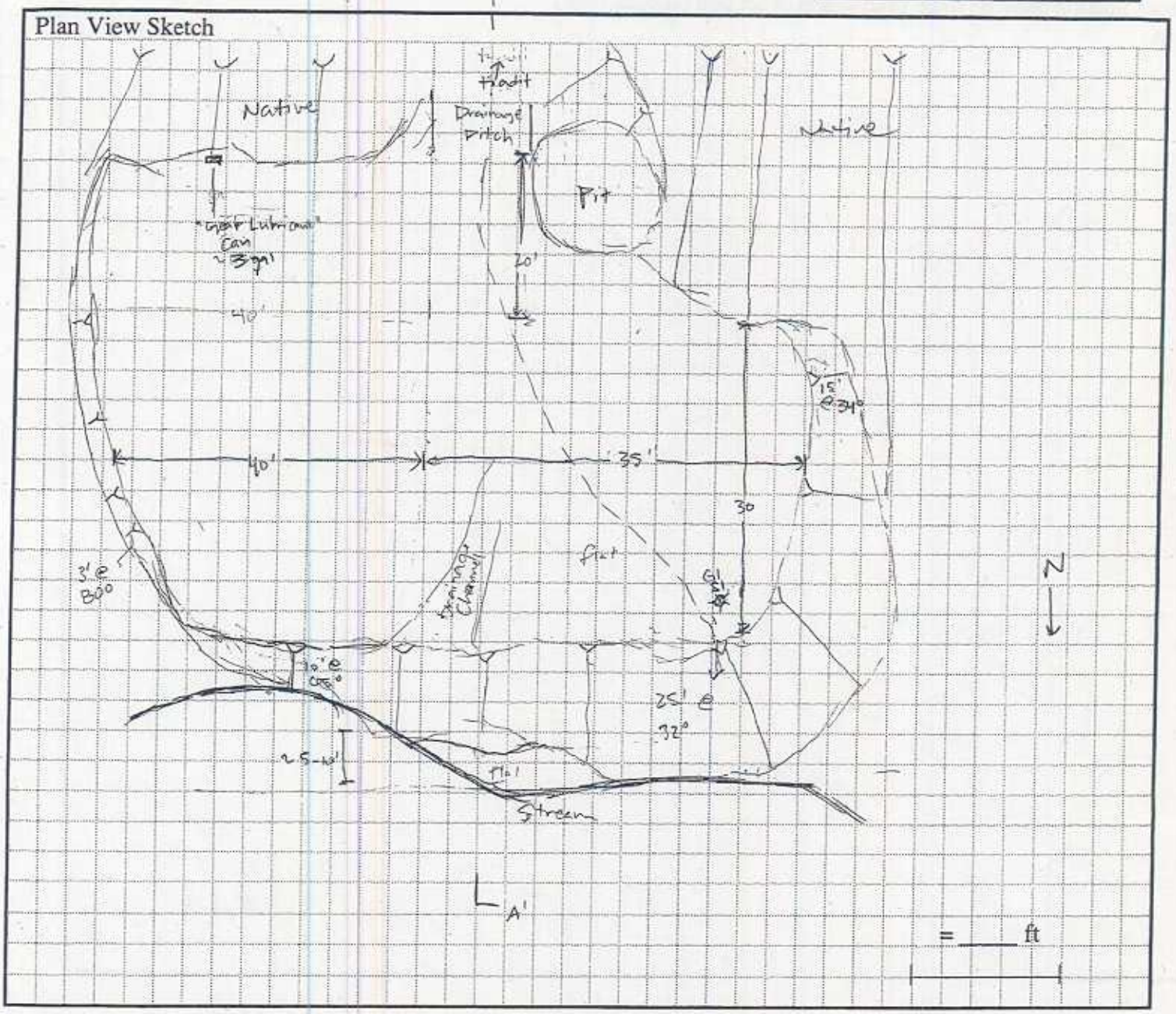
Other Observations:

	Description	Quantity	Endangered / Threatened ?	Distressed Vegetation?	Comments
Ground Cover	WR-1 is densely forested			N	
Vegetation					
Evidence of Wildlife or Recent Human Activity	(horse, prints, ...)				Cattle grazing near road. prints are found in mud near creek

AML FEATURE INVENTORY/MONITORING FIELD FORM

Feature ID	McNally
Date	7/14/06
Weather	clear skies, ~85° F

Plan View Sketch



INCLUDE THE FOLLOWING IN THE FIELD SKETCH FOR:

North Arrow
Scale Bar
Photo Location(s) and View Direction(s)
Sample Location(s) and ID(s):
- W-# Water
- S-# Soil
- T-# Tailings
- R-# Rock (Waste)
- O-# Ore
- S-# Other (Describe)

FOOTPRINT(S) OF:
- MILLS
- BUILDINGS
- STRUCTURES
- MINING-RELATED PILES
- OTHER

SURFACE WATER (PONDS, SEEPS, ETC.)
- GPS Collection Location ☼
- Elevation (Topographic Variation)
- Slope Direction

--> Seasonal Drainage Channel

Ecology AML

McNally			
Coordinate Name	**Northing**	**Easting**	**Altitude**
MCNALLY-WR1-S1	1319100	2216876	2431
MCNALLY-PIT1	1319065	2216908	2468
Average	**1319082**	**2216892**	**2449**

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 Adit 1. ←Up

Photograph 2 - View of Pit 2.