Appendix C

General Information Forms

GENERAL INFORMATION FORM

GENERAL

Region/Station: 06 Forest Number: _____ District No.: _____
Congressional District: 02

Project Name: Ajax/Magnolia Mines
Project Type: Site Inspection
Regional Priority: NA
5th Level HUC: NA 4th = 17070202 N.F. John Day
Single Site: ____ Multiple Site: x
List all site names in multiple sites: Ajax and Magnolia Mines

ENVIRONMENT

Watershed Name: North Fork John Day
Regional Watershed Priority: 02
Watershed size: ~1830 mi.^{2}
Size of disturbed area (acres): ~5
Nearest surface water source: Lucas Gulch
Miles of stream impacted by site: ~1/4 mile
303d listed impaired surface water Yes ____ No x
If 303d listed impaired, what are the water quality limited contaminants? _____

Is the site affecting a Wild and Scenic river Yes ____ No x
Describe potential for a catastrophic failure if not addressed: Low

Beneficial uses downstream: Recreation, salmonid habitat and passage
Nearest critical sensitive area: Wetlands, anadromous fish migration route
Distance sensitive area is from site: ~1/4 mile
Sensitive species: redband trout, westslope cutthroat trout
T&E species: _____
Is the soil environment conducive to contaminant movement Yes x No ____
Activities in the watershed that also contribute to environmental damage (logging, roads, dredging, grazing, etc.): Roads, mining, limited logging

Would a removal action have a noticeable positive impact on or reduce the potential future risk of damaged resources Yes x No ____
Other critical information relating to the environment: _____

HUMAN HEALTH AND SAFETY

	Within 200 ft of the Site	Within 4 mi of the Site	Within 15 mi of the Site
Year round population based on residences	0	~50	NA
Seasonal population based on residences	0	~50	NA
Water wells	0	1	NA
Surface water intakes	0	0	0

Recreational activities within 200 ft of the site: None

Recreational activities that occur within 15 mi of the site: Hiking, camping, fishing, hunting

Established recreational sites within 200 ft of the site: None

Established recreational sites within 15 mi of the site: Campgrounds, trails

Depth to groundwater (ft): NA

Beneficial uses downstream: Habitat, recreation

Physical hazards: Settling ponds, debris, steep slopes, open mine shafts on hillsides

Hazard	
Dangerous Highwall	No
Subsidence	No
Vertical Opening/Shaft	Yes
Dangerous Impoundment	No
Dangerous Pile and Embankment	No
Dangerous Slide	No
Hazardous Equipment or Unstable Structures	No
Hazardous Explosive Gases	No
Hazardous Water Body/Ponds	Yes
Solid Waste	No
Horizontal Opening/Adit	Yes

Other critical information relating to health and safety:

MIXED OWNERSHIP INFORMATION

% of the site on NFS land (managed by NFS): 100

% of the watershed on NFS land (managed by NFS): ~85

POTENTIAL CONTAMINATION

	Yes	No
Surface Water Indicators		
High turbidity in surface water		X
Active erosion into surface water	X	
Staining or precipitate/sediments	X	
Aquatic kills		X
Visible plume		X
Discharges to surface water sources (i.e., adit drainage or leachate)	X	
Noticeable decline in aquatic population (compared to upstream of the site)		X
Surface water void of life in the area of the mine site		X
Site located in the floodplain/wetland	X	
Failing or Inadequate Design		
Oversteepened slopes	X	
Unlined ponds	X	
Inadequate landfill design or dumps		X
Unstable retainment structure		X
Past Practices		
Uncontrolled landfill/dump		X
Improper disposal	X	
Chemical/wastes were stored onsite in drums/tanks, etc.	X	
Past practices at site used hazardous materials	X	
Other Indicators		
Stressed vegetation	X	
Dead vegetation or lack of vegetation	X	
Animal kills		X
Visual contaminants	X	
Heavily stained soils/salts present	X	

Other critical potential contaminant information: _____

_____

_____

ANALYTICAL/DOCUMENTED CONTAMINATION

Media	Distance	Location	Rate of Discharge/Volume (gpm or cy.)	Contaminant	Exceedance	Background
Water	On site	Magnolia East Adit	0.08 ft./sec.	Ba	Various	Various
		Magnolia West Adit	0 ft./sec.	As, Ba, Ca, Fe, Mn, Ni, Tl, TDS, DO	Various	Various
		Magnolia Pond	NA	As, Ba, Ca, Fe, Mn, Hg, Ni, TDS	Various	Various
		Lucas Gulch at Magnolia	0.03 ft./sec.	As, Ba, Hg, Se, Tl, TDS	Various	Various
	On Site	Ajax Adit	0.35 ft./sec.	Al, As, Ba, Fe, Pb, Mn, Hg, Ni, Se, TDS	Various	Various
		Ajax Pond	NA	Ba, Mn, Hg, TDS	Various	Various
		Lucas Gulch at Ajax	0.03 ft./sec.	As, Ba, Fe, Pb, Mn, Hg, TDS, DO	Various	Various
	~1/4 mile	Granite Creek	NA	As, Ba, Hg	Various	Various
Sediment	On site	Lucas Gulch at Magnolia	NA	An, As, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Ag, Zn	Various	Various
		Magnolia Pond	NA	Sb, As, Cd, Cr, Cu, Mn, Hg, Ni, Ag, Zn	Various	Various
	On site	Lucas Gulch at Ajax	NA	Sb, As, Cd, Cu, Pb, Mn, Hg, Ni, Ag, Zn	Various	Various
		Ajax Pond	NA	Sb, As, Cd, Cu, Mn, Hg, Ni, Zn	Various	Various
	~1/4 mile	Granite Creek	NA	Sb, As, Cd, Cu, Pb, Ag, Zn	Various	Various
Soil/Waste	On site	Magnolia Pond	NA	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Se, Ag, Tl, V, Zn	Various	Various
		Magnolia Test Areas	NA	Al, Sb, As, Ba, Cr, Pb, Mn, Hg, Se, Ag, Tl, V, Zn	Various	Various
Soil/Waste	On site	Magnolia Waste Piles	NA	Al, Sb, As, Ba, Be, Cr, Cu, Pb, Mn, Hg, Ni, Se, Ag, Tl, V, Zn	Various	Various
		Ajax Waste Piles	NA	Al, Sb, As, Ba, Be, Cr, Cu, Mn, Hg, Se, Tl, V, Zn	Various	Various

ADDITIONAL STUDIES

Biological studies that show a decrease in the number and lower species diversity downstream of the site: Yes ____ No x

Increased mortality in nesting wildlife: Yes ____ No x

Other critical contaminant information:

Appendix D

Copies of Supporting Information

HISTORIC OWNERS AND OPERATORS OF THE MAGNOLIA AND AJAX MINES:

Magnolia Mine:

1895 Magnolia Claim Group:

1. 1895, Michael Manley – locator
2. 1895 - 1903, John Coyle – locator/owner
3. 1895 - 1910, P.A. Conde – locator/owner
4. 1896 - 1915, A.P. Jones – locator/owner, J.T. Jones – locator/owner
5. 1899 - 1900, W.L. Vinson – locator/owner
6. 1899, J.K. Muir – locator
7. 1900 - 1910, Little Giant Gold Mining Company, Limited, Liverpool, England – purchase/owner
8. 1901, C.A. Johns – purchase
9. 1901, T.W.B. London – purchase
10. 1903 - 1916, Mary Thornburg – purchase/owner
11. 1910, Seymour Bell and J.T. Donnely – possible owners/employees of Little Giant
12. 1910 – 1915 (assumed, no records of sale found), Fred Sharp – purchase/owner
13. 1910 - 1915, W.J. Patterson – purchase, specifically listed 10-stamp mill in deed, owner
14. 1901 - 1916, Addie Jones – purchase (married to A.P. Jones)/owner
15. 1916 - 1917, Wm. J. Lachner – purchase/owner
16. 1916 – 1939 (deceased), W.A. Boyce – purchase, later operator/agent for Goddard-Hayes, owner
17. 1916 - 1918 (lost property in judgement), Goddard-Hayes Mines Company – purchase (Roland H. Goddard– Secretary, Maryett Goddard – President, J.J. Hayes - President), owner
18. 1917, Goddard and Company – purchase
19. 1918 - 1923, J.J. O'Dair – purchase/owner
20. 1919 - 1920, Ida Lachner – purchased Helena with mill, owner
21. 1934, Golden Center Mines, Inc. – operator
22. 1936, Mining and Development Corp (Deleware) – operator
23. 1934 - 1940, R.B. McGinnis – Manger for Golden Center Mines, Inc.
24. 1939 - 1940, Harry Cassidy – operator for Golden Center Mines, Inc.
25. 1939 - 1949, Heirs of W.A. Boyce – James, Tom M., Milledge E. and Gilbert Boyce, owners
26. 1941 – 1952 (last record for Wilder), Vida V. Wilder – owner
27. 1949 – 1974, Richard E. and Charles M. Boyce – purchase/owner
28. 1974 – 1996 (property enters Trust in 1983), Roger Milliken – purchase/owner
29. 1974 – 1996 (property enters Trust in 1984), Ora R. Kingsley – purchase/owner
30. 1974 – 1996 (property enters Trust in 1984), Ora K. Smith – purchase/owner
31. 1979 – 1989 (Several employees used during this time period), W.A. Bowes, Inc – operator
32. 1989, K-M Minerals, Inc. – operator
33. 1990 – 1991, Tom Van Diepan – operator
34. 1991, Tony Moreno – operator
35. 1991, Widland Contractors, Inc – operator
36. 1992, Patrick Cassidy – operator
37. 1992, Dallas Wilson – operator

38. 1994 – 1996, Mickey Guinn – operator
39. 1994 – 1996, Carl Barney – operator
40. 1994 – 1996, Bill Noones – operator
41. 1994 – 1996, Bill Dobell – operator

Claims dropped in 1996

1965 Magnolia Group

1. 1965 – 1997 (deceased), H.W. Sipp – locator/owner
2. 1965 – 1979, F.H. Day – locator/owner
3. 1965 – 1979, C.H. Murphey – locator/owner
4. 1971 – 1972, J. Swindle – operator
5. 1971 – 1972, Bud Morrow – operator
6. 1973, C. Temple – operator
7. 1974, Cameron Daggett – operator
8. 1974 – 1980, Dan Sipp – operator
9. 1976 – 1986, Dick Sipp – operator
10. 1975 - 1977, Tom Langton – operator
11. 1976 – 1978, Terry Valentine – operator
12. 1978 – 1988, C.R. Sipp –operator
13. 1979 – 1980, D.E. Smith – operator
14. 1982, Aden Allen – operator
15. 1982 – 1989, Joe, Adam & Norman Brooks – operators
16. 1987, Ben Finks – operator
17. 1990 – 1994, Fred Quimby Mining and Construction – operator
18. 1994 – 2001, Keystone Mining Co (Jeff Young) – operator
19. 1984 – 2001, Gentria Sipp – owner
20. 1997 – 2001, Eleanor Sipp – owner

Claims dropped by BLM in 1998, they continued filing until 2001

Ajax Mine:

1. 1895, Daniel Boyce – locator
2. 1895 – 1905, James McCourt – locator/owner
3. 1895, John Coyle – locator
4. 1896 – 1899, W.W. Looney – purchase/owner
5. 1896 – 1899, Thas McEuen – purchase/owner
6. 1896 – 1898, E.E. Thornburg – purchase/owner
7. 1898 – 1902, John English – purchase/owner
8. 1899 – 1917, George Graham – locator/owner
9. 1899, Samuel Kelly – purchase (?)
10. 1899 – 1916, P.A. & Nettie Conde – purchase/owner
11. 1899 – 1916, John T. Jones – purchase/owner
12. 1899 – 1916, Helen Richardson – purchase
13. 1899 – 1902, L. Butler – locator/owner
14. 1899 – 1902, Matt Walter – locator/owner
15. 1899 – 1902 (?), W.L. Vinson – locator/owner
16. 1900 – 1912, A.P. Jones – purchase/owner

17. 1902, William Crowe – locator
18. 1902 – 1916, Finlay McDonald – purchase/owner
19. 1905 – 1940 (deceased), J.J. O'Dair – purchase/owner
20. 1909 – 1916 (?), Fred Sharp – purchase/owner
21. 1917 - 1935, Wm. Lachner – purchase/owner
22. 1940 – 1950, Estate of J.J. O'Dair – inheritance
23. 1950 – 1951, Bertha O'Dair – inheritance
24. 1950 - ?, Neva (Short) O'Dair – inheritance
25. 1950 – 1996, Rosemary (Guinn Burton) O'Dair – inheritance
26. 1951 – 1972, Jack Short – operator
27. 1951 – 1972, Jack Guinn – operator
28. 1968 - 1972, Henry Potts – operator
29. 1970 - 1991, Vern Guinn – operator
30. 1974 – 1992 (property enters Trust in 1984), Roger Milliken – lessee, Ora R. Kingsley – lessee, Ora K. Smith – lessee
31. 1979 – 1989, W.A. Bowes, Inc – operator
32. 1990 – 1991, Tom Van Diepan – operator
33. 1991, Tony Moreno – operator
34. 1991, Widland Contractors, Inc – operator
35. 1992, Patrick Cassidy – operator
36. 1992, Dallas Wilson – operator
37. 1994 – 1996, Mickey Guinn – operator
38. 1994 – 1996, Carl Barney – operator
39. 1994 – 1996, Bill Noones – operator
40. 1994 – 1996, Bill Dobell – operator,

Claims dropped in 1996

OREGON NATURAL HERITAGE INFORMATION CENTER

Institute for Natural Resources

OREGON STATE UNIVERSITY
1322 SE Morrison Street
Portland, Oregon 97214-2423

September 15, 2003

Jeryl Kolb
EA Engineering, Science, and Technology
12011 Bellevue-Redmond Road, Suite 200
Bellevue, WA 98005

Dear Mr. Kolb:

Thank you for requesting information from the Oregon Natural Heritage Information Center (ORNHIC). We have conducted a data system search for rare, threatened and endangered plant and animal records for your Ajax, Blackjack, and Monumental Mine sites in Township 8 South, Range 35.5 East, Section 22; Township 9 South, Range 35 East, Section 14; and Township 9 South, Range 36 East, Section 18, W.M., respectively.

Six (6) records were noted within a two-mile radius of your project and are included on the enclosed computer printout. A key to the fields is also included.

Please remember that the lack of rare element information from a given area does not mean that there are no significant elements there, only that there is no information known to us from the site. To assure that there are no important elements present, you should inventory the site, at the appropriate season.

Please note that at this time ORNHIC does not have comprehensive computerized records available for all anadromous fish in Oregon. I have listed below the species that may be present within the waterways contained in the project area. I have also included their listing by the National Marine Fisheries Service (NMFS). For more information on anadromous fish you may wish to contact NMFS at: 525 NE Oregon Street; Portland, Oregon 97232-2737. Please also note that the U.S. Fish and Wildlife Service now has jurisdiction over coastal cutthroat trout.

Steelhead (Middle Columbia River)	*Oncorhynchus mykiss*	Threatened

This data is confidential and for the specific purposes of your project and is **not to be distributed.**

If you need additional information or have any questions, please do not hesitate to contact me.

Sincerely,

Cliff Alton
Conservation Information Assistant

encl.: invoice (H-091503-CWA1)
computer printout and data key

STATE OF OREGON

DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

Bulletin No. 49

LODE MINES OF THE CENTRAL PART
of the
GRANITE MINING DISTRICT, GRANT COUNTY, OREGON

By

George S. Koch, Jr.
Assistant Professor of Geology
Oregon State College

1959

Price $1.00

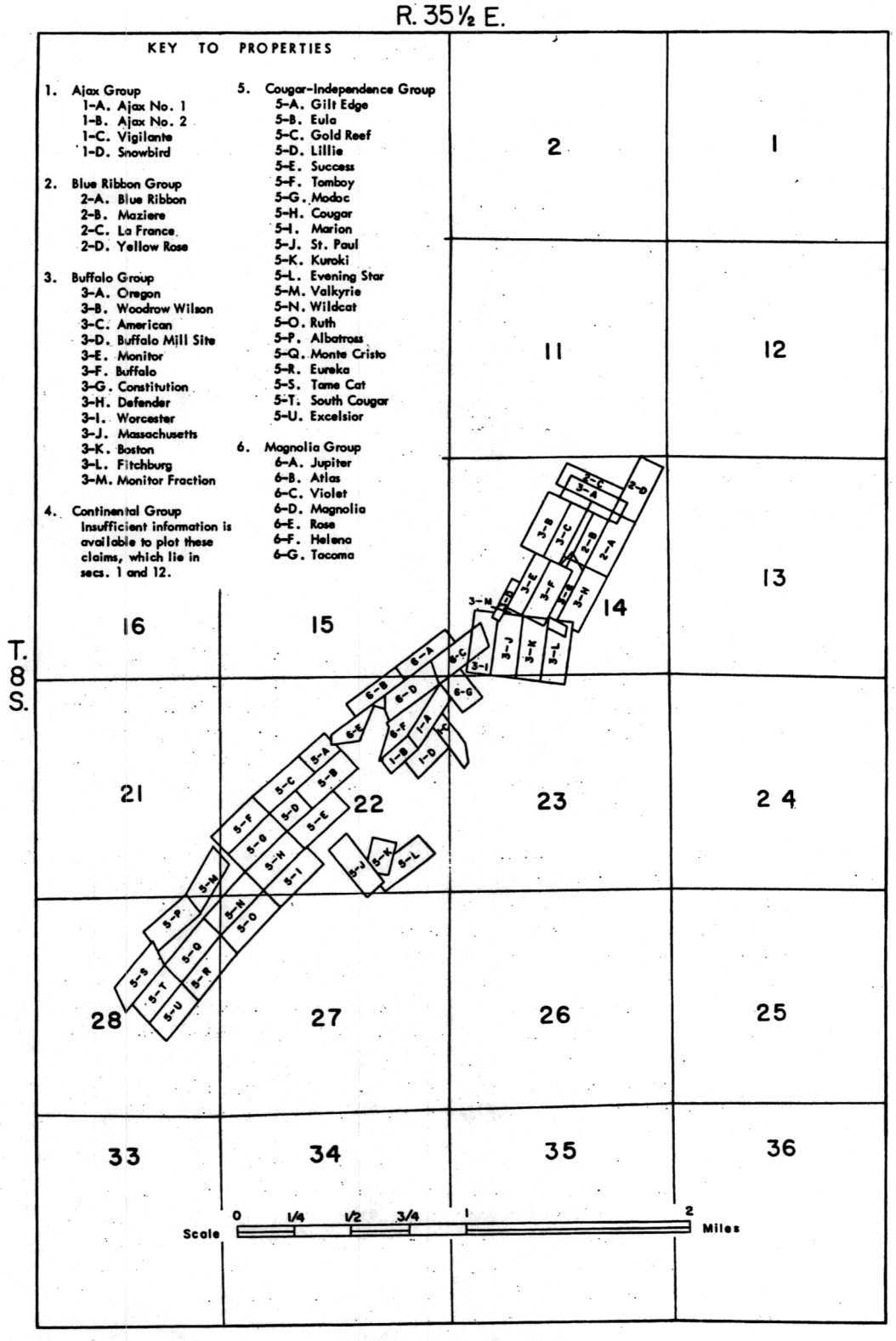

Figure 4 - Granite district. Sketch map showing locations of some of principal claims. Compiled from sources of varying reliability and accuracy.

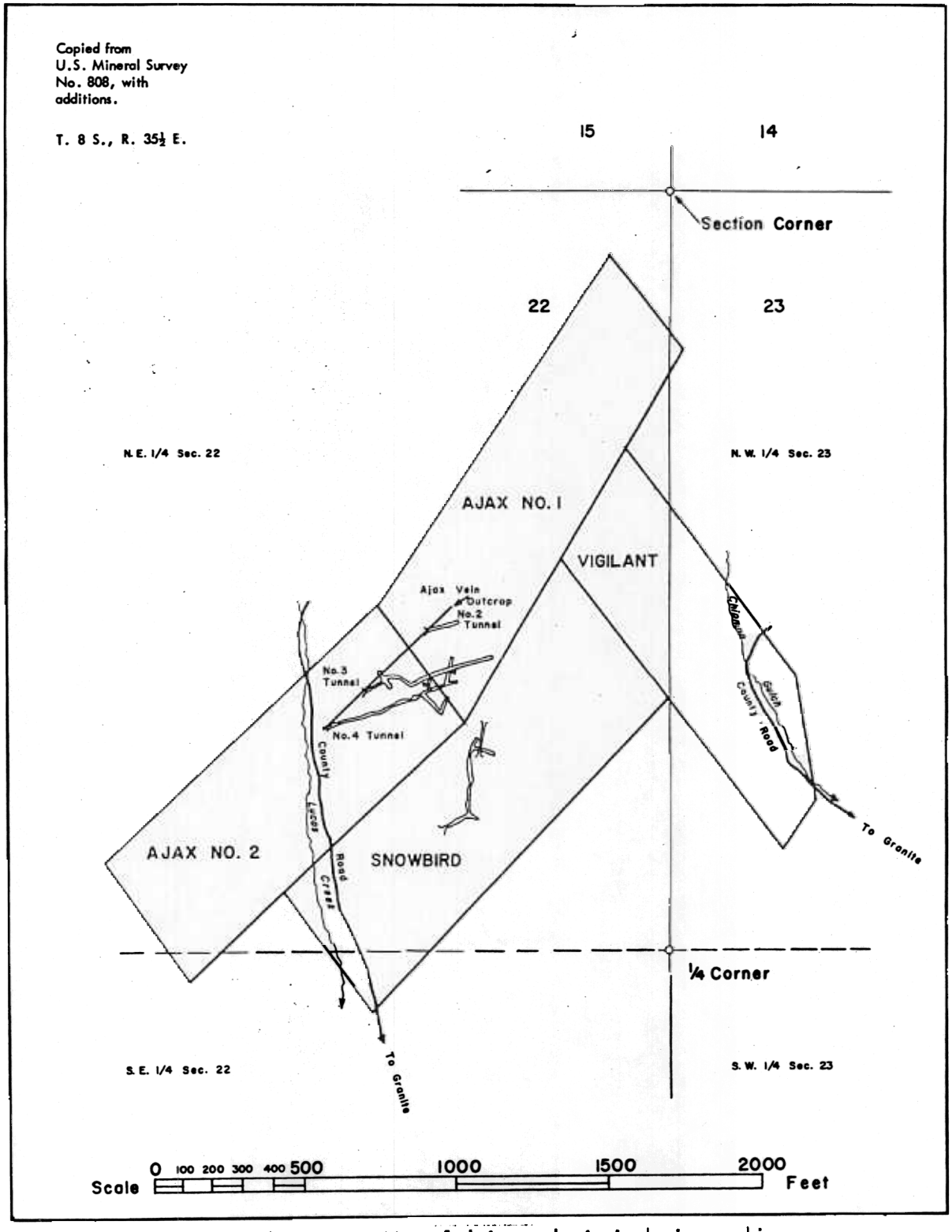

Figure 5 - Ajax mine. Map of claims and principal mine workings.

Ajax Mine

General description

The Ajax mine is about 3 miles north of Granite on Lucas Creek (Figure 3, opposite page 9) and is connected with the forest road along Granite Creek by a good road. The property consists of four unpatented lode claims, Ajax No. 1, Ajax No. 2, Snowbird, and Vigilant (Figure 4, opposite page 11). On these claims two veins crop out, the Ajax vein which is developed by drifts on three levels and the Snowbird vein which is developed by drifts on two levels (Figure 5 on opposite page). Most of the gold production was apparently obtained between 1905 and 1906 when $40,000 worth of ore is said to have been taken from a shoot 90 feet long in the No. 3 tunnel on the Ajax vein. In recent years there has been little development work and little or no production. The present owner is Mrs. Rosemary L. Guinn, Route 2, Box 558, Washougal, Washington. Mr. Jack Guinn allowed the writer to inspect the property and gave useful information.

Geology

The country rock is entirely argillite. Although all of the upper tunnels are caved and only a part of the No. 4 tunnel was accessible in 1957 (Figure 5), surface outcrops and plans of the inaccessible workings indicate that the strikes and dips of the veins and their character probably are like those visible in the No. 4 tunnel.

Where exposed for 370 feet by the No. 4 tunnel (Figure 6) the Ajax vein ranges in width from 1 inch or less to 4 feet, generally widening somewhat where it swings to the left.

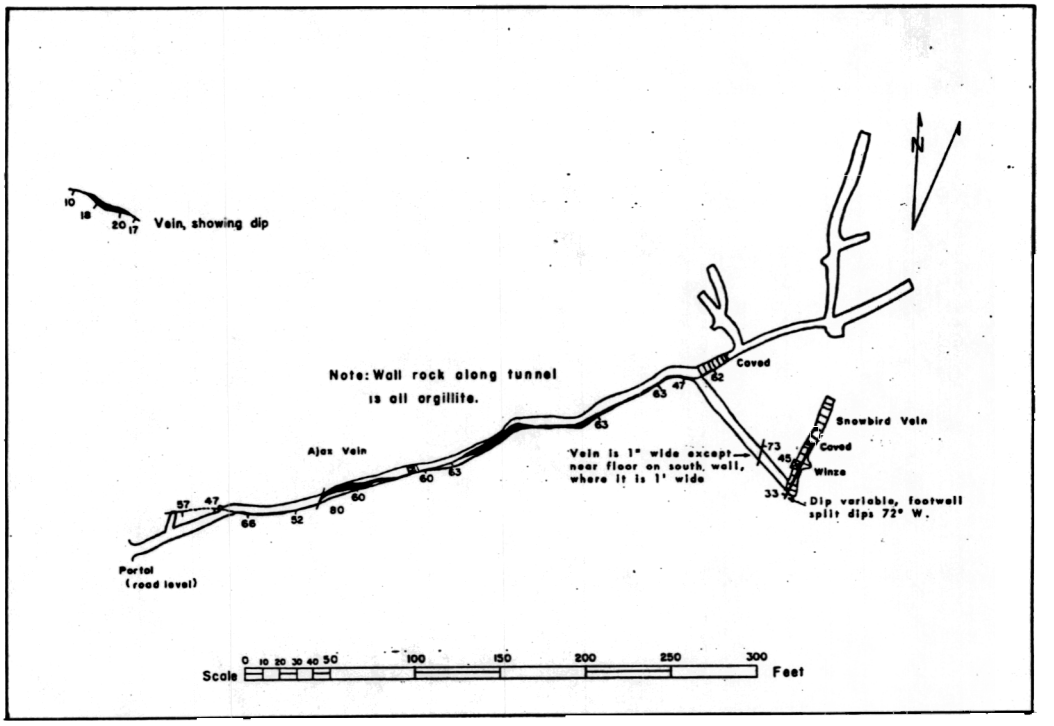

Figure 6 - Ajax mine. Geologic map of No. 4 tunnel (at road level). Caved portions of workings from map by John E. Allen, 1938.

attributed to downward enrichment, following the weathering and erosion of the superficial portion of the vein. The extent of exploration on the vein, however, does not warrant a statement of the extent to which ore has been enriched by this process.

"Several light decomposed dikes, 2 to 4 feet wide, with southeast courses, have been found in both walls. These terminate against the vein and indicate that it fills a fault fissure, although the amount of displacement has not been determined."

Mill, camp, and equipment

The mill and equipment were described in the Oregon Metal Mines Handbook (Oregon Department of Geology and Mineral Industries, 1941, p. 49). Most of this is gone, although some of the houses in the once extensive camp remain in good condition.

Magnolia Mine

General description

The Magnolia mine is on Lucas Creek about 3½ miles north of Granite (Figure 3, opposite page 9) and is connected with the forest road along Granite Creek by a good road. There are seven unpatented lode claims: Jupiter, Atlas, Violet, Magnolia, Rose, Helena, and Tacoma (Figure 4, opposite page 11). The mine worked one vein, the Magnolia (Figure 2, opposite page 5), which is developed by an adit (Figure 23, in pocket) about 1050 feet in length whose portal is near the level of Lucas Creek and by shorter adits and pits on the hillside northeast of the creek. Lindgren (1901, p. 684) states that the Magnolia mine began operation in 1899 when a 10-stamp mill was built, and ore containing an unknown, but certainly small, amount of gold was extracted until about 1904 (Pardee and Hewett, 1914, p. 105). Evidently most of the work accomplished after 1904 consisted of driving the principal adit about 100 feet.

The writer was allowed to inspect the Magnolia property through the courtesy of Mr. Richard E. Boyce, West 41-37 Avenue, Spokane, Washington, who holds a 2/5 interest in the mine. Mr. C. M. Boyce of St. Maries, Idaho, has another 2/5 interest, and Mrs. Vida V. Wilder, 816 Westford Street, Lowell, Massachusetts, has the remaining 1/5 interest. Mr. Boyce also supplied an assay map (Figure 23) of the main adit made by Mr. Ed McAllister and Mr. Harold Culp of the Cougar-Independence Company.

Geology

On the surface the Magnolia vein is clearly exposed from the portal of the main adit northeastward to where the vein, if still present, is covered by the younger volcanic rocks of Tertiary age (Figure 2). The vein has not been found to the southwest of the main adit, but it is probable that a detailed inspection of the heavily wooded hillside between the main adit and the outcrop of the Independence vein, perhaps aided by some trenching, would indicate that the Independence and Magnolia veins are the same.

In 1957 the upper workings on the Magnolia vein were caved and the main adit was caved at a point about 650 feet from the portal (Figure 23, in pocket). The accessible part of the vein is almost entirely timbered so that the rocks and vein are not exposed. About 500 feet from the portal the vein is visible where it was stoped to a height averaging about 20 feet above the level. There the vein is 2½ to 3 feet in width and composed of black-to-white gouge with sharp, distinct walls indicating a strong fracture of the argillite. No sulfide minerals or gangue of quartz or calcite were noted. Measurements in the stope and elsewhere indicate that the strike of the vein is consistently about N. 58° E. and that the dip is con-

Appendix E

Aquatic and Terrestrial Species Tables

APPENDIX E - AQUATIC AND TERRESTRIAL SPECIES TABLES

Table E-1. Sensitive and Listed Animal Species Potentially Occurring in Grant County, OR

Species	Federal and (State) Status	Habitat
BIRDS		
Bald Eagle	LT, (LT)	Unlikely since insufficient water nearby
Black-backed woodpecker	(SC)	High elevation forest
Boreal Owl	(SU)	High elevation forest
Flammulated Owl	(SC)	Ponderosa Pine
Great Gray Owl	(SV)	High elevation forest
Lewis's Woodpecker	SoC, (SC)	Forested areas
Loggerhead Shrike	(SV)	Lower elevations
Northern Goshawk	SoC, (SC)	Will be checked in Heritage database
Northern Pygmy Owl	(SC)	Forested areas
Peregrine Falcon	(LE)	Will be checked in Heritage database
Pileated Woodpecker	(SV)	Forested areas
Pine grosbeak	(S2?)	High elevation forest
Pygmy Nuthatch	(SC/SV)	Ponderosa Pine
Olive-sided Flycatcher	SoC, (SV)	Forested areas
Three-toed Woodpecker	(SC)	High elevation forest
Willow Flycatcher	SoC, (SU)	Riparian areas
White headed Woodpecker	SoC, (SC)	Ponderosa Pine
MAMMALS		
Big-eared Bat	SoC, (SC)	May use mine sites for roosting
Canada Lynx	LT	Unlikely to encounter
Fisher	SoC, (SC)	Unlikely to encounter
Fringed Bat	SoC, (SV)	May use mine sites for roosting
Hoary Bat	(S4?)	Unlikely to use mines
Hoary Bat	(S4?)	Unlikely to use mines
Long-eared Bat	SoC, (SU)	May use mine sites for roosting
Long-legged Bat	SoC, (SU)	May use mine sites for roosting
Marten	(SV)	Unlikely to encounter
Pallid Bat	SoC, (SV)	Lower elevation
Preble's shrew	SoC	Unlikely at over 5000 ft.
Pygmy Rabbit	SoC, (SV)	Lower elevation
Silver-haired bat	SoC, (SU)	Unlikely to use mines
Small-footed Bat	SoC, (SU)	May use mine sites for roosting
Wolverine	SoC, (LT)	Will be checked in Heritage database
Yuma Bat	SoC	May use mine sites for roosting
REPTILES AND AMPHIBIANS		
Spotted Frog (*Rana luteiventris)*	-, (SU)	ONHIC shows on Granite Creek
Painted Turtle (*Chrysemys picta)*	-, (SC)	

Species	Federal and (State) Status	Habitat
Northern Sagebrush Lizard	SoC, (SV)	Elevation on Clear Creek may be too high
FISH		
Inland redband (rainbow) trout (*Oncorhynchus mykiss*)	SoC, (SV)	
Malheur mottled sculpin (*Cottus bendirei)*	SoC, (SC)	Unlikely in Clear Creek.
Westslope cutthroat trout (*Oncorhychus clarki lewisi*)	SoC, (SV)	
Bull trout (*Salvelinus confluentus*)	SoC, (SC)	Unlikely in Clear Creek.

NOTE:
LE = Listed Endangered, state or federal.
LT = Listed Threatened, state or federal.
SoC = Federal Species of Concern; under review by US Fish and Wildlife Service.
Oregon Fish and Wildlife Commission, Sensitive Species:
S2 = Imperiled.
SC = Critical, listing is pending or may be appropriate.
SV = Vulnerable; population declining, but listing not imminent.
SP = Peripheral or naturally rare.
SU = Undetermined status.
Source: Oregon Natural Heritage Program (2001).

Table E-2. Wildlife Species Observed at Magnolia and Ajax Mine Sites, July 2003.

Scientific Name	Common Name	Comments
Birds		
Buteo jamaicensis	Red-tailed Hawk	Seen once flying over
Chordeiles minor	Common Nighthawk	Fly over one day
Picoides villosus	Hairy woodpecker	Heard calling on hillside
Sphyrapicus nuchalis	Red-naped Sapsucker	Heard calling on hillside
Colaptes auratus	Northern Flicker	Seen on hillside
Sitta canadensis	Red-breasted nuthatch	Heard in forest
Poecile gambeli	Mountain chickadee	Heard in *forest*
Regulus satrapa	Golden-crowned	Kinglet Heard in forest
Cyanocitta stelleri	Steller's Jay	Fly over
Corvus corax	Common Raven	Fly over
Nucifraga columbiana	Clark's Nutcracker	Fly over
Turdus migratorius	American Robin	Present along stream
Catharus guttatus	Hermit Thrush	Heard calling on hillside
Piranga ludoviciana	Western Tanager	Heard calling in conifers
Dendroica coronata	Audubon's Warbler	Territorial defense on hillside
Dendroica sp.	Unknown warbler	Townsend's?
Junco hymenalis	Dark-eyed Junco	Present on hillside
Vireo sp.	Exact species unknown	Nest found on ground in riparian zone just downstream of Magnolia Mine.
Mammals		
Microtus sp.	Vole species	
Eutamias amoenus	Yellow Pine Chipmunk	
Odocoileus hemoionus	Mule deer	Evidence in scat
Reptiles and Amphibians		
None Observed		
Fish		
Oncorhynchus spp	Redband and/or Cutthroat trout	

Table E-3. Sensitive Plant Species, North Fork John Day Ranger District, Umatilla National Forest, 2001

Scientific Name	Federal and (State) Status	Habitat
Allium campanulatum	(HS)	MONT
Allium madidum	(HS)	MWM
Allium tolmiei platyphyllum	(HS)	CF
Allium validum	(HS)	R, MWM
Astragalus reventus	(HS)	R, MONT
Botrychium crenulatum	SoC, (C)	R, MWM
Botrychium lanceolatum	(S)	R, MWM
Botrychium lunaria	(S)	R, MWM
Botrychium minganense	(S)	R, MWM
Botrychium montanum	(S)	R, MWM
Botrychium paradoxum	SoC, (C)	R, MWM
Botrychium pedunculosum	SoC, (C)	R, MWM
Botrychium pinnatum	(S)	R, MWM
Botrychium simplex	(HS)	MF
Calypso bulbosa	(HS)	MF
Castilleja glandulifera	(HS)	A, RCB
Carex interior	(S)	R, MWM
Calochortus longebarbatus longebarbatus	(S)	R, MWM
Corallorrhiza trifida	(HS)	A, MWM
Cypripedium montanum	(HS)	MF
Eriogonum thymoides	(HS)	SB-PJ
Lupinus burkei s. burkei (L. polyphyllus)	(HS)	R, MWM
Lycopodium annotinum	(HS)	MF
Mimulus washingtonensis	(HS)	MWM
Orobanche pinorum	(HS)	CF
Pedicularis bracteosa pachyrhiza	(HS)	A
Penstemon pennellianus	(HS)	MF
Polystichum lemmonii (P. mohricides)	(HS)	SERP
Ribes hudsonianum	(HS)	MONT, R, MWM
Ribes oxyacanthoides s. cognatum	(HS)	MONT, R
Silene scaposa scaposa	(HS)	SB-PJ
Trifolium douglasii	SoC	R, MWM
Trifolium plumosum s. plumosum	(HS)	MONT, RCB

Habitat Key:

A	=	Alpine.	R	=	Riparian, Aquatic.
CF	=	Conifer Forest	RCB	=	Rock outcrops, cliffs, or bluffs.
MF	=	Moist Forest	SB-PJ	=	Sagebrush-Pinon Juniper Forest
MONT	=	Mountains	SERP	=	Serpentine
MWM	=	Moist and Wet Meadows.			

(C) = State Candidate/Sensitive species.
(HS) = Historically State Sensitive.
(S) = State Sensitive.
SoC = Species of Concern (Federal)

Federal status information obtained from Oregon Natural Heritage Program (ONHP) database, 2001.

Habitat information obtained from Hitchcock and Cronquist, 1973.

Table E-4. Plant Species Observed at the Magnolia and Ajax Mine sites, July 2003.

Scientific Name	Common Name
Trees	
Abies amabilis	Silver Fir (planted)
Abies grandis-concolor	Grand Fir Successional
Alnus incana	Red alder (small shrubby plants)
Larix occidentalis	Larch (on hillside)
Picea engelmanii	Spruce
Pinus contorta	Lodgepole Pine
Pinus ponderosa	Ponderosa Pine
Populus sp.	Cottonwood (a few plants on Granite Creek)
Pseudotsuga menziesii	Douglas fir
Salix sp	willow species (not flowering)
Woody Shrubs	
Amelanchier alnifolia	Serviceberry/ Saskatoon
Arctostaphylos uva-ursi	Kinickinick
Cornus stolonifera	Red-osier Dogwood at confluence with Granite Creek
Ribes sp	Swamp gooseberry, likely *lacustre*
Ribes sp.	Red currant
Sambucus cerulea	Blue elderberry
Sambucus canadensis	Red elderberry
Vaccinium scoparium	whortleberry/grouseberry
Vaccinium sp.	blueberry/huckleberry sp.
Grasses and Forbs	
Acontium sp.	Larkspur species
Aquilegia sp. (formosa ?)	Columbine species
Carex sp.	Sedge species
Castilleja sp.	Paintbrush
Claytonia sp. (*lanceolata* ?)	Miner's lettuce/Springbeauty species
Delphinium sp.	Larkspur species
Equisetum sp.	Horsetail species
Juncus sp.	Soft rush species, likely *effusus*
Festuca sp.	Fescue, likely idahoensis
Epilobium spp.	Fireweed, several species, likely *angustifolium*
Fragaria sp (*vesca* and *virginiana)*	Wild Strawberry
Gallium sp.	Bedstraw sp.
Geum sp.	Large-leaved Avens (likely *macrophyllum*)
Goodyera oblongifolia	Rattlesnake plantain
Linnaea borealis	Twinflower
Lupinus sp.	Lupine species
Mimulus sp. (*guttatus*?)	Yellow monkeyflower
Mimulus sp. (*lewisii* ?)	Pink monkeyflower
Planthera sp. (*dilatata* ?)	White bog orchid (not
Potentilla sp	Cinquefoil species
Rannunculus sp. (uncinatus?)	Buttercup species

Table E-4 cont.

Scientific Name	Common Name
Saxifrage sp.	Saxifrage species
Sedum sp.	Stonecrop species
Silene sp.	Bladder campion species
Thalictrum occidentale	Meadowrue
Trifolium sp.	Clover species
Viola sp.	Violet species (no flowers present)

Appendix F

Detailed Wetlands Description

Appendix F – Detailed Wetlands Assessment

A wetland assessment was performed by a field biologist at both Ajax and Magnolia Mine sites during the SI investigation. Wetland information was obtained by comparing information on the National Wetlands Inventory (NWI) maps to observations recorded in the field, and then verifying these using wetland definitions in 40 CFR 230.3 (CERCLA definition). This definition states that *wetlands are those areas that are inundated or saturated by surface or ground water at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions*. The primary difference between this definition and the NWI definition is the requirement to support a prevalence of rooted emergent hydrophytes. Areas that under normal circumstances do not support hydrophytes could be mapped under the NWI system, but would not meet the definition according to 40 CFR 230.3.

In verifying field and NWI information against the CERCLA definition, a matrix comparing the two systems was used (USEPA 1992). This table lists the NWI categories of wetland and deep-water habitats and indicates which ones would also meet the CERCLA definition. An archetypal NWI mapped wetland that also meets the CERCLA definition has the designation PEMB or PSSB. This means the wetland is palustrine, with emergent or scrub-shrub vegetation, and is saturated enough for the vegetation to be hydrophytic. A wetland designated R3UBH means upper perennial riverine, with an unconsolidated bottom and in a permanently saturated condition. This type of habitat usually does not have the emergent vegetation required for the CERCLA definition of a wetland.

The NWI 7.5-minute topographic map for the Granite quadrangle (USFWS 1994) was examined to compare with the characterization of wetlands in the vicinity of the sites. Lucas Gulch is characterized on the map as *Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded* (R3UBH), as are most of the permanent streams in the area. As discussed above, this classification does not meet the CERCLA definition of a wetland unless vegetation present is hydrophytic. The upper and lower ends of Lucas Gulch, including the confluence with Granite Creek, are mapped as PEMA, B, C, and PSSC (*Palustrine emergent and scrub-shrub vegetation with temporarily flooded, saturated, and seasonally flooded conditions*). All of these classifications meet the CERCLA definition of a wetland. There are also a number of palustrine ponds along Granite Creek downstream of the confluence with Lucas Gulch. These are mapped by the NWI as:

PUBHx - *Palustrine Unconsolidated Bottom, Permanently Flooded, Excavated.*
PABHx - *Palustrine Aquatic Bed, Permanently Flooded, Excavated*
PEMF - *Palustrine Emergent Vegetation, Semi-permanently Flooded*
PEMFx - *Palustrine Emergent Vegetation, Semi-permanently Flooded, Excavated*
PSSCx - *Palustrine Scrub-Shrub Vegetation, Seasonally Flooded, Excavated*

Historical placer mining activities were quite extensive along Granite Creek, and are most likely responsible for the creation of these areas.

References:

United States Environmental Protection Agency (USEPA). 1992. Hazard Ranking System Guidance Manual. Office of Solid Waste and Emergency Response. EPA540-R-92-026, OSWER Directive 9345.1-07. November.

United States Fish and Wildlife Service (USFWS). 1994. National Wetland Inventory 7 ½ Minute Quadrangle Maps, including Granite, Greenhorn, Olive Lake, and Vinegar Hill Lookout.

Appendix G

Aquatic Survey Results Summary Tables

Table G-1a. Number and relative abundance of taxa collected from riffle habitat near Magnolia and Ajax Mines, 18-19 July 2003.

Taxa	MAGN-ST-BMR-01		MAGN-ST-BMR-02		MAGN-ST-BMR-03		AJAX-ST-BMR-04	
	No.	%	No.	%	No.	%	No.	%
Turbellaria	28	4.52	1	0.43	66	6.16	5	1.70
Lumbriculidae	2	0.32	2	0.85	7	0.65	--	--
Tubificidae	18	2.91	11	4.68	15	1.40	13	4.42
Ostracoda	--	--	5	2.13	--	--	--	--
Hydracarina	14	2.26	1	0.43	4	0.37	2	0.68
Ameletus	--	--	--	--	--	--	2	0.68
Diphetor hageni	4	0.65	2	0.85	12	1.12	3	1.02
Cinygmula	--	--	12	5.11	16	1.49	15	5.10
Cinygma	32	5.17	5	2.13	20	1.87	4	1.36
Epeorus (Ironopsis)	--	--	--	--	--	--	1	0.34
Paraleptophlebia	9	1.45	4	1.70	7	0.65	1	0.34
Serratella teresa	16	2.58	2	0.85	11	1.03	7	2.38
Serratella tibialis	7	1.13	5	2.13	23	2.15	4	1.36
Drunella flavilinea	--	--	--	--	1	0.09	--	--
Drunella spinifera	2	0.32	--	--	6	0.56	2	0.68
Malenka	--	--	--	--	7	0.65	10	3.40
Zapada cinctipes	90	14.54	27	11.49	84	7.84	14	4.76
Yoraperla brevis	2	0.32	--	--	26	2.43	3	1.02
Doroneuria baumanni	7	1.13	1	0.43	15	1.40	7	2.38
Perlodidae	4	0.65	5	2.13	4	0.37	2	0.68
Paraperla	--	--	2	0.85	18	1.68	6	2.04
Sweltsa	21	3.39	32	13.62	31	2.89	15	5.10
Rhyacophila	14	2.26	--	--	4	0.37	--	--
Rhyacophila brunnea grp.	4	0.65	3	1.28	40	3.73	2	0.68
Hydroptila	14	2.26	2	0.85	8	0.75	2	0.68
Micrasema	99	15.99	5	2.13	44	4.10	3	1.02
Neophylax	--	--	2	0.85	--	--	2	0.68
Cryptochia	2	0.32	1	0.43	--	--	1	0.34
Homophylax	2	0.32	2	0.85	7	0.65	--	--
Lepidostoma	2	0.32	--	--	7	0.65	3	1.02
Cleptelmis ornata	7	1.13	1	0.43	55	5.13	3	1.02
Heterlimnius corpulentus	8	1.29	21	8.94	94	8.77	41	13.95
Heterlimnius koebelei	90	14.54	3	1.28	--	--	--	--
Narpus concolor	--	--	--	--	1	0.09	--	--
Optioservus quadrimaculatus	--	--	--	--	4	0.37	--	--
Tropisternus	--	--	--	--	2	0.19	--	--
Helophorus	--	--	1	0.43	--	--	--	--
Paracymus	--	--	--	--	4	0.37	--	--
Ceratopogoninae	--	--	1	0.43	--	--	1	0.34
Tanypodinae	4	0.65	2	0.85	--	--	--	--
Pentaneurini	4	0.65	2	0.85	33	3.08	9	3.06
Diamesinae	4	0.65	5	2.13	59	5.50	8	2.72
Orthocladiinae	21	3.39	25	10.64	141	13.15	25	8.50
Chironomini	--	--	--	--	--	--	1	0.34
Tanytarsini	4	0.65	12	5.11	29	2.71	26	8.84
Dixa	--	--	--	--	4	0.37	2	0.68
Simulium	32	5.17	23	9.79	51	4.76	3	1.02
Pedicia	14	2.26	5	2.13	22	2.05	2	0.68
Clinocera	--	--	1	0.43	--	--	1	0.34
Glutops	--	--	--	--	--	--	2	0.68
Hydrobiidae	18	2.91	1	0.43	90	8.40	41	13.95
Pisidium	20	3.23	--	--	--	--	--	--
Total	619	100.00	235	100.00	1,072	100.00	294	100.00

Table G-1b. Number and relative abundance of taxa collected from riffle habitat in Granite Creek near Magnolia and Ajax Mines, 18-19 July 2003.

Taxa	GRAN-ST-BMR-53		GRAN-ST-BMR-54	
	No.	%	No.	%
Turbellaria	72	6.59	38	2.28
Lumbriculidae	--	--	12	0.72
Tubificidae	315	28.85	260	15.62
Hydracarina	27	2.47	12	0.72
Ameletus	--	--	6	0.36
Baetis tricaudatus	46	4.21	57	3.42
Diphetor hageni	--	--	6	0.36
Cinygmula	29	2.66	18	1.08
Epeorus (Ironopsis)	4	0.37	6	0.36
Paraleptophlebia	--	--	14	0.84
Caudatella	5	0.46	--	--
Serratella teresa	19	1.74	12	0.72
Serratella tibialis	27	2.47	48	2.88
Drunella spinifera	6	0.55	1	0.06
Malenka	--	--	18	1.08
Zapada cinctipes	5	0.46	--	--
Yoraperla brevis	66	6.04	236	14.17
Doroneuria baumanni	2	0.18	--	--
Hesperoperla pacifica	4	0.37	96	5.77
Kogotus	1	0.09	--	--
Paraperla	5	0.46	--	--
Sweltsa	4	0.37	21	1.26
Wormaldia	--	--	14	0.84
Parapsyche elsis	4	0.37	--	--
Rhyacophila	12	1.10	--	--
Rhyacophila alberta grp.	--	--	6	0.36
Rhyacophila brunnea grp.	--	--	27	1.62
Rhyacophila verrula grp.	3	0.27	--	--
Hydroptila	4	0.37	--	--
Brachycentrus americanus	5	0.46	19	1.14
Micrasema	161	14.74	134	8.05
Neophylax	1	0.09	--	--
Lepidostoma	8	0.73	--	--
Brychius	4	0.37	--	--
Cleptelmis ornata	20	1.83	132	7.93
Heterlimnius koebelei	17	1.56	17	1.02
Narpus concolor	4	0.37	1	0.06
Zaitzevia parvula	--	--	6	0.36
Ceratopogoninae	8	0.73	--	--
Pentaneurini	4	0.37	6	0.36
Diamesinae	46	4.21	78	4.68
Orthocladiinae	93	8.52	183	10.99
Chironomini	4	0.37	6	0.36
Tanytarsini	19	1.74	114	6.85
Dixa	--	--	--	--
Simulium	31	2.84	12	0.72
Pedicia	4	0.37	30	1.80
Clinocera	--	--	1	0.06
Glutops	--	--	18	1.08
Pisidium	3	0.27	--	--
Total	1,092	100.00	1,665	100.00

Table G-1c. Number and relative abundance of taxa collected from pool habitat in Granite Creek near Magnolia and Ajax Mines, 18-19 July 2003.

Taxa	GRAN-ST-BMP-53		GRAN-ST-BMP-54	
	No.	%	No.	%
Turbellaria	21	4.46	36	4.85
Lumbriculidae	--	--	16	2.15
Tubificidae	82	17.41	155	20.86
Ostracoda	11	2.34	86	11.57
Hydracarina	5	1.06	19	2.56
Ameletus	8	1.70	16	2.15
Baetis tricaudatus	43	9.13	6	0.81
Diphetor hageni	29	6.16	--	--
Cinygmula	10	2.12	--	--
Cinygma	5	1.06	--	--
Paraleptophlebia	4	0.85	7	0.94
Serratella teresa	7	1.49	3	0.40
Serratella tibialis	16	3.40	--	--
Drunella spinifera	5	1.06	7	0.94
Malenka	5	1.06	3	0.40
Yoraperla brevis	26	5.52	3	0.40
Hesperoperla pacifica	6	1.27	20	2.69
Kogotus	5	1.06	--	--
Paraperla	2	0.42	3	0.40
Sweltsa	7	1.49	9	1.21
Rhyacophila	9	1.91	--	--
Rhyacophila brunnea grp.	4	0.85	--	--
Hydroptila	2	0.42	--	--
Micrasema	10	2.12	--	--
Dicosmoecus gilvipes	--	--	1	0.13
Psychoglypha	2	0.42	9	1.21
Lepidostoma	14	2.97	3	0.40
Oreodytes	--	--	23	3.10
Cleptelmis ornata	9	1.91	--	--
Heterlimnius koebelei	8	1.70	--	--
Narpus concolor	1	0.21	--	--
Ceratopogoninae	4	0.85	--	--
Tanypodinae	2	0.42	19	2.56
Pentaneurini	5	1.06	19	2.56
Diamesinae	11	2.34	31	4.17
Orthocladiinae	33	7.01	71	9.56
Chironomini	2	0.42	3	0.40
Tanytarsini	23	4.88	90	12.11
Simulium	9	1.91	--	--
Dicranota	5	1.06	--	--
Molophilus	2	0.42	--	--
Pedicia	2	0.42	--	--
Clinocera	4	0.85	--	--
Glutops	5	1.06	63	8.48
Pisidium	8	1.70	22	2.96
Total	471	100.00	743	100.00

Table G-2. Summary of Level 3 Metrics and Scores for Macroinvertebrate Sampling Locations Near Magnolia and Ajax Mines, 18-19 July 2003.

Serial Number	Date	Sample Type	Sample Location	Taxa Richness	Score	Mayfly Richness	Score	Stonefly Richness	Score	Caddisfly Richness	Score	Sensitive Taxa	Score	Sediment Sensitive Taxa	Score	Modified HBI	Score	Percent Tolerant Taxa	Score	Percent Sediment Tolerant Taxa	Score	Percent Dominant (single taxa)	Score	**Total Score**
MAGN-ST-BMR-01	19-Jul-03	Riffle	1	34	3	6	3	5	3	7	3	6	5	0	1	3.3	5	6.6	5	5.5	5	16.0	5	**38**
MAGN-ST-BMR-02	19-Jul-03	Riffle	2	36	5	6	3	5	3	6	3	5	5	0	1	3.7	5	6.8	5	7.7	5	13.6	5	**40**
MAGN-ST-BMR-03	19-Jul-03	Riffle	3	39	5	8	3	7	5	6	3	6	5	0	1	3.6	5	8.3	5	4.1	5	13.2	5	**42**
AJAX-ST-BMR-04	18-Jul-03	Riffle	4	39	5	9	5	7	5	6	3	7	5	0	1	3.8	5	6.1	5	5.1	5	14.0	5	**44**
GRAN-ST-BMR-53	18-Jul-03	Riffle	53	38	5	7	3	7	5	8	3	8	5	1	3	3.9	5	31.4	3	29.2	1	28.9	3	**36**
GRAN-ST-BMR-54	18-Jul-03	Riffle	54	35	3	9	5	4	3	5	3	4	3	1	3	3.6	5	24.6	3	18.1	3	15.6	5	**36**
GRAN-ST-BMP-53	18-Jul-03	Pool	53	42	5	9	5	6	5	6	3	6	5	0	1	4.2	3	19.7	3	19.3	3	17.4	5	**38**
GRAN-ST-BMP-54	18-Jul-03	Pool	54	27	3	5	3	5	3	3	1	4	3	0	1	5.1	1	26.1	3	23.0	3	20.9	3	**24**

TABLE G-3. SUMMARY OF HABITAT ASSESSMENT SCORES
FOR MAGNOLIA AND AJAX MINES AND GRANITE CREEK SAMPLING STATIONS - JULY 2003

Habitat Parameter	Magnolia Mine Stations 01	02	03	Ajax Mine Station 04	Granite Creek Stations 53	54
Epifaunal substrate/available cover	16	13	13	13	17	16
Embeddedness	14	8	11	13	18	17
Velocity/depth regime	6	6	6	6	11	13
Sediment Deposition	19	19	19	18	12	10
Channel flow status	20	19	20	20	20	20
Channel alteration	20	20	20	20	20	20
Frequency of riffles (or bends)	20	19	20	20	20	20
Bank stability						
Left bank	10	10	10	10	9	10
Right bank	10	10	10	10	10	10
Vegetative protection						
Left bank	10	10	10	10	10	10
Right bank	10	10	10	10	10	10
Riparian vegetative zone width						
Left bank	8	5	5	6	8	9
Right bank	10	10	10	10	10	10
SCORE	173	159	164	166	175	175

Appendix H

Waste Pile Calculations

WASTE PILE CALCULATIONS – MAGNOLIA MINE AND AJAX MINE SI

Calculations performed in Land Development Desktop using Grid, Composite Surface, and the Prismoidal methods. Only the prismoidal results are reported, with the other quantities used for quality control. Other methods agree within 2% of prismoidal method.

Waste pile calculations as follows:

At Magnolia Mine:

- Waste rock pile near upper collapsed adit - 1171 cu.yds
- Waste pile near the creek at the northern end of the site in the riparian zone - 45 yds^3.
- Waste pile downgradient of the lower east portal - 13 yds^3
- Waste pile in the riparian zone near the settling ponds - 188 yds^3.
- Waste pile located on the west side of FS Road 580 near the southern end of the site, also in the riparian zone - 8 $yds^{3.}$

At Ajax Mine:

- Waste pile located near the collapsed portal - 134 yds^3
- Waste pile located on a relatively flat slope in the riparian zone of Lucas Gulch (near the settling pond) - 375 yds^3

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Appendix I

Soil Sample Descriptions

SOIL SAMPLE DESCRIPTIONS, MAGNOLIA AND AJAX MINE SITES SI

Mine Site	Sample ID	Sample Interval	Sample Description	Soil Description
Ajax	AJAX-WP-SUS-10 (2.0)	1.5 - 2.0	Upper adit waste pile	Reddish to tan grey f-c sand, some f-c gravel, little rock shards
Ajax	AJAX-WP-SUS-09 (1.0)	0.8 - 1.0	Lower adit waste pile	Grey brown f-c sand, some f-c gravel and rock shards
Ajax	AJAX-WP-SUS-08 (1.2)	1.0 - 1.2	Lower adit waste pile	Red brown f-c sand, some f-c gravel and rock shards
Magnolia	MAGN-WP-SUS-14 (3.0)	2.5 - 3.0	Upper adit waste pile	Brown f-c sand, some f gravel and rock shards
Magnolia	MAGN-TA-SUS-18 (1.5)	1.0 - 1.5	Downhill of upper WP	Tan loamy vf-f sand, tr m-c sand, f gravel
Magnolia	MAGN-TA-SSS-15 (0.5)	0.4 - 0.5	Old crusher by lower waste pile	Grey f-c sand, some f gravel and rock shards, light grey and red staining
Magnolia	MAGN-WP-SSS-16 (0.5)	0.4 - 0.5	Lower adit waste pile	Tan f-c sand, little f-c gravel and rock shards, light grey staining, very hard
Magnolia	MAGN-PD-SSS-12 (0.3)	0.0 - 0.3	Lower settlement pond	Red brown sandy silt
Magnolia	MAGN-WP-SUS-17 (2.0)	1.5 - 2.0	Lower adit waste pile	Brown f-c sand, little f-c gravel and rock shards with iron staining on rock shard surfaces
Reference	LUCA-BG-SSS-19 (0.5)	0.4 - 0.5	Reference sample near Magnolia	Light tan loamy vf-f sand, tr m-c sand, f gravel
Reference	GRAN-BG-SSS-35 (0.5)	0.4 - 0.5	Reference sample near Granite Cr.	Tan vf sand
Reference	GRAN-BG-SSS-34 (0.5)	0.4 - 0.5	Reference sample near Granite Cr.	Orange brown vf sand
Reference	GRAN-BG-SSS-36 (0.5)	0.4 - 0.5	Reference sample near Granite Cr.	Brown loamy vf-c sand, little f gravel