

OSBORNE MINE
PRELIMINARY ASSESSMENT REPORT
BOISE COUNTY, IDAHO

STATE OF IDAHO
DEPARTMENT OF ENVIRONMENTAL QUALITY

October 2003

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

January 30, 2004

Reply To
Attn Of: ECL-115

Bureau of Land Management
1387 Vinnell Way
Boise, Idaho

To whom it may concern:

The Idaho Department of Environmental Quality (DEQ) has completed a report summarizing the findings of a visit conducted at the Osborne Mine site in May, 2003. 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,

A handwritten signature in black ink, appearing to read "Ken Marcy", written over a large, light-colored oval shape.

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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LIST OF ACRONYMS

| <u>Acronym</u> | <u>Definition</u> |
|----------------|---|
| amsl | above mean sea level |
| BLM | United States Bureau of Land Management |
| DEQ | Department of Environmental Quality |
| EPA | United States Environmental Protection Agency |
| gpm | gallons per minute |
| PPE | Probable Point of Entry |
| TDL | Target Distance Limit |
| TMDL | Total Maximum Daily Limit |
| 303(d) | Section of the Clean Water Act in Idaho |

1. INTRODUCTION

The Idaho 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 Osborne Mine site located near Horseshoe Bend, Idaho in Boise County. DEQ completed PA activities in accordance with the goals listed below.

The specific goals for the Osborne Mine 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.

Completion of 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 as Appendix A.

2. SITE BACKGROUND

2.1 SITE LOCATION

| | |
|-------------------------|---|
| Site Name: | Osborne Mine |
| CERCLIS ID No.: | NA |
| Location: | Boise County, Idaho |
| Latitude: | 43° 54' 57"N |
| Longitude: | 116° 12' 57"W |
| Legal Description: | NW ¼ NE ¼ of Section 33, T7N, R2E, Boise Meridian |
| Congressional District: | Idaho |
| Site Owner: | Bureau of Land Management 1387 Vinnell Way Boise, Idaho |

2.2 SITE DESCRIPTION/OWNERSHIP HISTORY

The Osborne Mine is a former gold and silver mine located in Boise County, Idaho, approximately 2 miles southwest of Horseshoe Bend, Idaho (Figure 2-1). The mine exists on BLM property at the northeast end of a gold belt that stretches from Pearl, Idaho to Horseshoe Bend, Idaho. The mine is located approximately 1500 feet southeast from the Payette River at an elevation of approximately 2800 feet above mean sea level. The mine was developed to access gold-bearing lodes which developed from gold-bearing ore solutions filling fissures caused by recurring movements along zones of weakness during and after dike intrusion. Two other nearby mines, the Kentuck and the Nellie, access similar fissures approximately one-half to one mile to the southwest from the Osborne Mine.

The State of Idaho Mine Inspector's Annual Report of 1907 (Bell, 1907) indicates that the Osborne Mine was owned by the Osborne-Idaho Gold Mines Development Company. The property had a vertical shaft and a milling plant of approximately 50 tons per day capacity. The mill had a crusher, concentrating tables, a small tube mill, and cyanide equipment that used compressed air agitation.

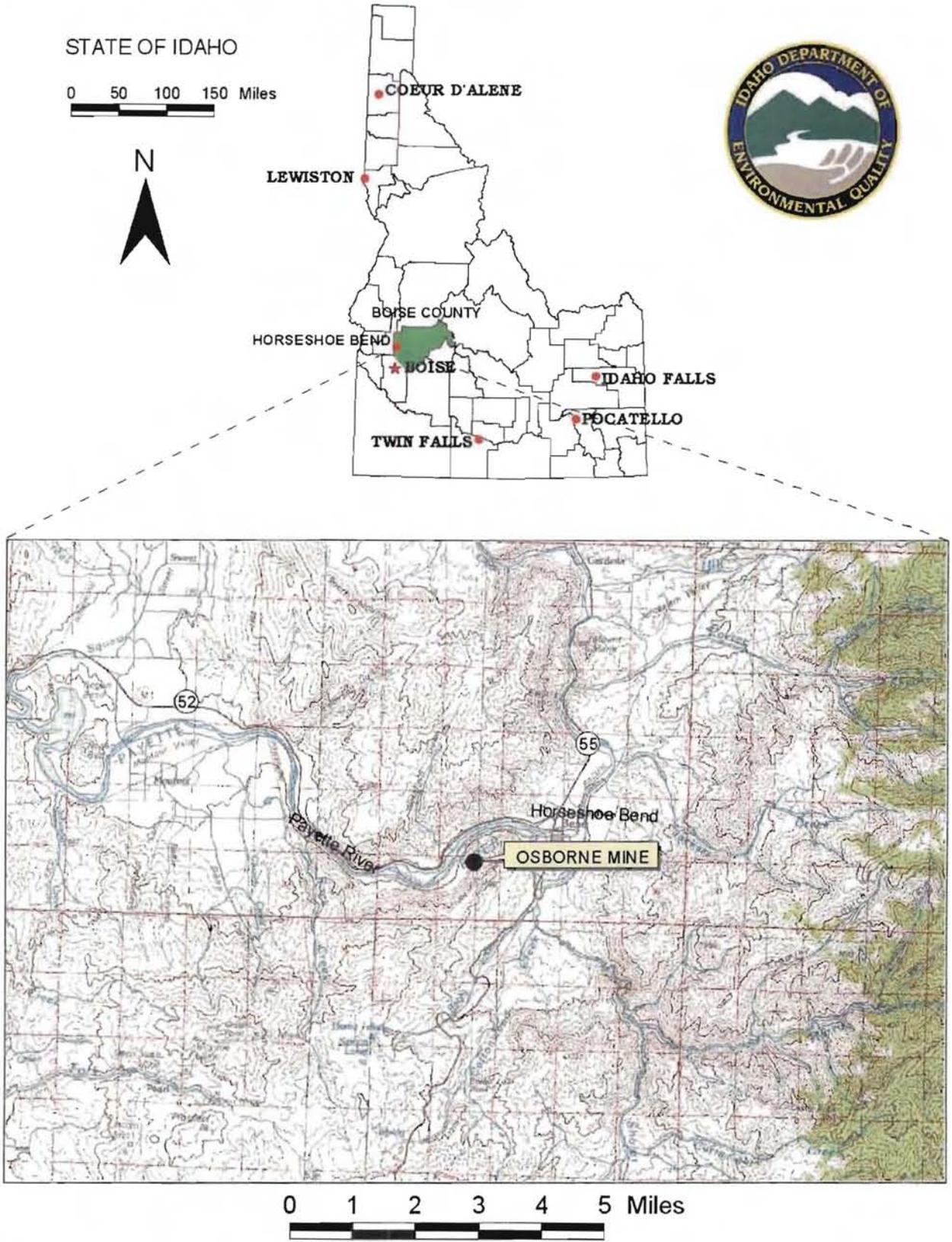
According to Anderson (1934, p. 32), the mine consisted of three minor surface openings and a vertical shaft and incline shaft. The 400-foot deep shaft has crosscuts at 200, 300, and 400 feet totaling about 5,000 feet of workings. Much of the work was done prior to 1910, however, work continued until 1919. Recovery was done by amalgamation and cyanidation.

The property carried two well-defined fissure veins in a black diorite granite which strike easterly and westerly. The north vein contained lead and zinc sulphides mixed with arsenopyrites, while the south vein carried only a trace of lead and zinc. The mine was developed to access the sulfide-rich metamorphosed sediments that were deposited along a prominent dike zone in batholithic rock (Anderson, 1934). The lodes are complex, consisting of sulphide (predominantly arsenopyrite and pyrite) seams, lenses, and stringers, in highly metamorphosed quartz diorite, granodiorite, and younger dike rock. The fracture zone extends from Pearl, Idaho to Horseshoe Bend, Idaho in Gem and Boise Counties.

Low recoveries halted operation at least twice, once before 1910 and again in 1919. The mine has not been worked since 1919, and was filled with water during a 1933 site visit by Alfred Anderson (1934).

The mine is currently located on land managed by the BLM and an ownership search indicated that it is and has been an unpatented claim.

FIGURE 2-1. Site Vicinity Map of Osborne Mine



2.3 SITE OPERATIONS AND WASTE CHARACTERISTICS

The mine deposits of the Pearl-Horseshoe Bend gold belt consist predominantly of sulfides. Arsenopyrite and pyrite are the main constituents, however sphalerite and galena, as well as traces of chalcopyrite and tetrahedrite are also present (Anderson, 1934). A large rhyolite porphyry dike is located north of the Osborne Mine.

According to the State of Idaho Mine Inspector's Annual Report of 1907 (Bell, 1907), cyanidation was carried out at the Osborne Mine but adverse results were obtained. The ore reportedly carried some free gold but amalgamation was not successful either. Like most mines within the Pearl Mining District, the Osborne Mine closed once sulfide ores were reached several hundred feet below the surface, and treatment of the ores proved too difficult. Much of the development of the Osborne Mine was done prior to 1910. Mining was discontinued then, or earlier, and again in 1919 because of low gold recovery. No production records for the Osborne Mine were available.

The Osborne Mine has been developed by several minor openings on the surface and a vertical shaft and incline (Anderson, 1934). The shaft was reported to be 400 feet deep and the underground workings total about 5,000 feet. Several lodes cross the property, each striking approximately North 70° East.

An opening was made approximately 400 yards up the gulch to the east-northeast. The outcrop is heavily iron-stained. The remaining waste rock pile is still visible near the dry gulch (see Appendix A, Photo No. 5). The second main lode lies south of the shaft. It has had the most development and has one drift 1,300 feet long. A third lode was opened in the bottom of the gulch about 100 yards north of the shaft.

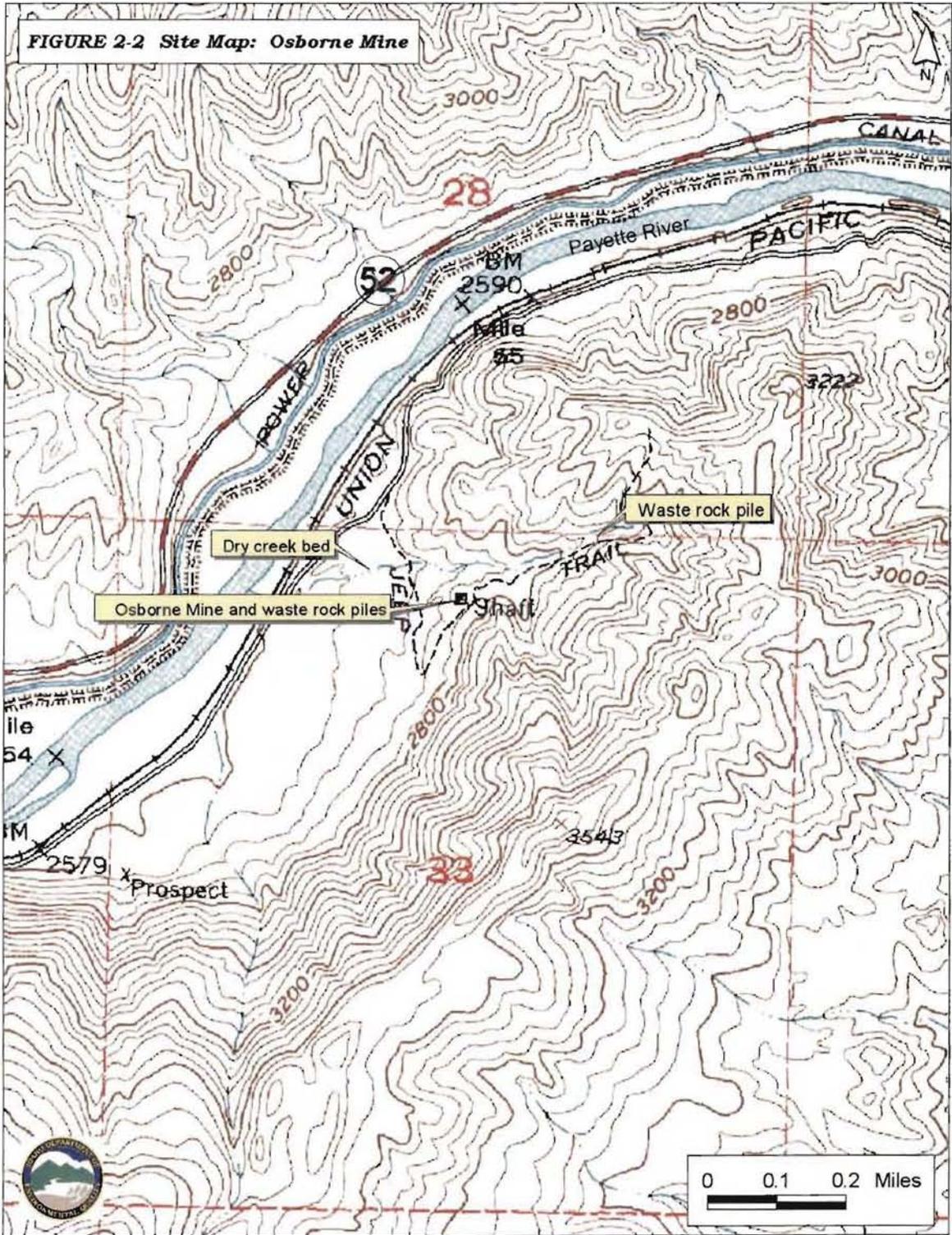
2.4 DEQ ACTIONS

The DEQ conducted a site visit on May 29, 2003. The site is not fenced and is readily accessible by driving west from Horseshoe Bend on the south side of the Payette River, and turning south on the dirt road just before a solid waste transfer station.

Site features include an old concrete foundation, a collapsed shaft, and three worked surface areas (see Figure 2-2, Site Map). Waste piles are located near two of the worked surface areas and immediately downhill of the shaft and foundation. Refer to site photographs (Nos. 1-5) in Appendix A.

No discolored soil or stains were observed near the waste rock piles. No surface water was observed in any areas of the former mine, including the gulch north of the shaft. The shaft was completely closed and no underground openings were observed.

All of the workings show evidence of many types of usage around and on them. Evidence of recreational uses includes empty beer cans and empty shell casings from both hunting and target shooting. Wildlife observed during the visit include big game animals (mule deer), gamebirds (chukars, California quail), predatory birds (red-tail hawk), scavenger birds (magpies), and songbirds. This area is also a deer wintering area, as evidenced by the shed deer antler found just uphill from the site. Free-range cattle traverse the area at least part of the year.



3. 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).

3.1 GROUND WATER MIGRATION PATHWAY

Anderson (1934) describes the events leading to the present day geology of the ore deposits near the Osborne Mine in the following order. Lodes and dikes were formed along a fracture zone in the Idaho batholith during the middle of the Tertiary Period. Recurring movement created fissures and preferential pathways for ore solutions to enter the country rock. Subsequent erosion leveled the topography to almost present-day levels by the middle of the Miocene, before it was covered by Columbia River basalts and sediments of the Payette formation during the middle or upper Miocene. Lastly, the lodes and dikes have been exposed by erosion before, during, and after regional warping and normal faulting.

Groundwater flow in the country-rock is expected to be limited to the preferential pathways of faults and brecciated zones. The Osborne mine is situated just uphill of an alluvial fan that extends to the Payette River's floodplain, about 0.25 miles from the shaft. If conditions are such to create groundwater flow surrounding the workings, the water that does not filter into the brecciated zones of bedrock will flow directly to the alluvial fan and the presumably shallow vadose zone. The infiltration potential for contaminants from the Osborne Mine to enter the groundwater is considered to be low.

Contributions to the aquifer surrounding the Osborne Mine will predominantly be as a direct result of precipitation, both in the form of rain and snow, although an ephemeral stream exists just to the east of Osborne Mine's shaft. As the region is semi-arid, it receives only limited annual precipitation, mostly in the winter months. Annual precipitation for Emmett, approximately 20 miles to the west, is 13.32, with a maximum 24 rainfall event of 2.47 inches (WRCC).

Dry-season rainfall occurs almost exclusively in relatively short bursts, usually related to thunder activity. It is expected that almost all dry-season rainfall events would be completely absorbed by the soils and plants, without much, if any, contributions to the groundwater.

There are 78 drinking water and irrigation wells located within the 4-mile Target Distance Limit (TDL). The nearest well used for drinking water purposes is approximately 0.6 miles west-southwest from the Osborne Mine. The site is not located within a wellhead protection area (DEQ, 2002).

3.2 AIR MIGRATION PATHWAY

The nearest residence to the Osborne Mine is located approximately one mile west southwest of the site. The town of Horseshoe bend (population 812) is located approximately two miles to the northeast.

The site is comprised of unconsolidated sulfide-rich ore and/or waste rock, varying in degree of compaction. The ore and/or waste rock is primarily confined to dumps. The likelihood of aerial dispersal from the dumps and prospects appears remote.

3.3 SOIL EXPOSURE PATHWAY

Access to the Osborne Mine is essentially unrestricted. A two-track dirt road is present which leads up to the ridge behind the mine, flanking the dry creek bed. The two-track road flanks waste piles near the shaft and a waste pile associated with surface workings approximately 400 yards up the gulch. A barbed wire gate exists across the two-track road as the only restriction to the mine, however, the gate's primary function appears to keep cattle on the uphill side of the fence as it is not locked.

There is abundant evidence of recreational use as well as cattle activity surrounding the mine site, however, there are no residences or workers within 200 feet of the mine. The nearest residence is approximately one mile west southwest of the site. No schools or day-care facilities are located within 200 feet of the site.

3.4 SURFACE WATER MIGRATION PATHWAY

The site slopes to the west and north towards the Payette River. An unnamed westerly draining ephemeral stream flanks the two surface workings and former mine shaft, before the slope gradient decreases into an alluvial fan.

No surface water was observed during the site inspection in May 2003. The mine shaft is completely caved-in and no water appeared to be draining from the closed mine. A small spring was observed in one of the ephemeral stream's tributaries, however, it dried up within 50 yards. One potential Probable Point of Entry (PPE) would be the dry creek bed located north of the Osborne Mine shaft, which could hold run off from the waste piles before flowing west towards the Payette River.

The maximum 24-hour rainfall event for Emmett is 13.32 inches (WRCC, 2002). Although bedrock is relatively shallow, due to the coarseness of the soil, and observations at the site, the potential for flooding of the shaft or their associated workings would appear to be low.

The use of surface water for watering of livestock and wildlife as well as crop irrigation is expected to occur in the general area near the mine. No ground water discharge from any of the shafts or tunnels was observed during the site inspection.

Sport fishing within the 14 mile TDL occurs for rainbow trout, small mouth and large mouth bass, and bullfrogs. Fish catch data, however, could not be determined. A Wildlife Management Unit, designated by Idaho Fish and Game as a location to plant pheasants and limit activity during waterfowl nesting season, also occurs within the TDL. Migratory waterfowl also utilize the river during their annual migrations.

There are no drinking water intakes within the TDL and there are no §303(d) listed streams in the area.

One listed endangered species, a bald eagle nest site, was identified approximately four miles west-northwest from the Osborne Mine (Idaho F&G, 2003). One species of concern the mountain quail or *Oreortyx pictus*, was identified 1.5 miles south from the Osborne Mine. The Columbia pebblesnail (listed watch species), was identified at two miles west from the site. According to the U.S. Fish and Wildlife Service (2002), there are no wetlands within the subject site. Additional wetlands data was unavailable.

FIGURE 3-1 Osborne Mine Site 4-Mile Radius Map

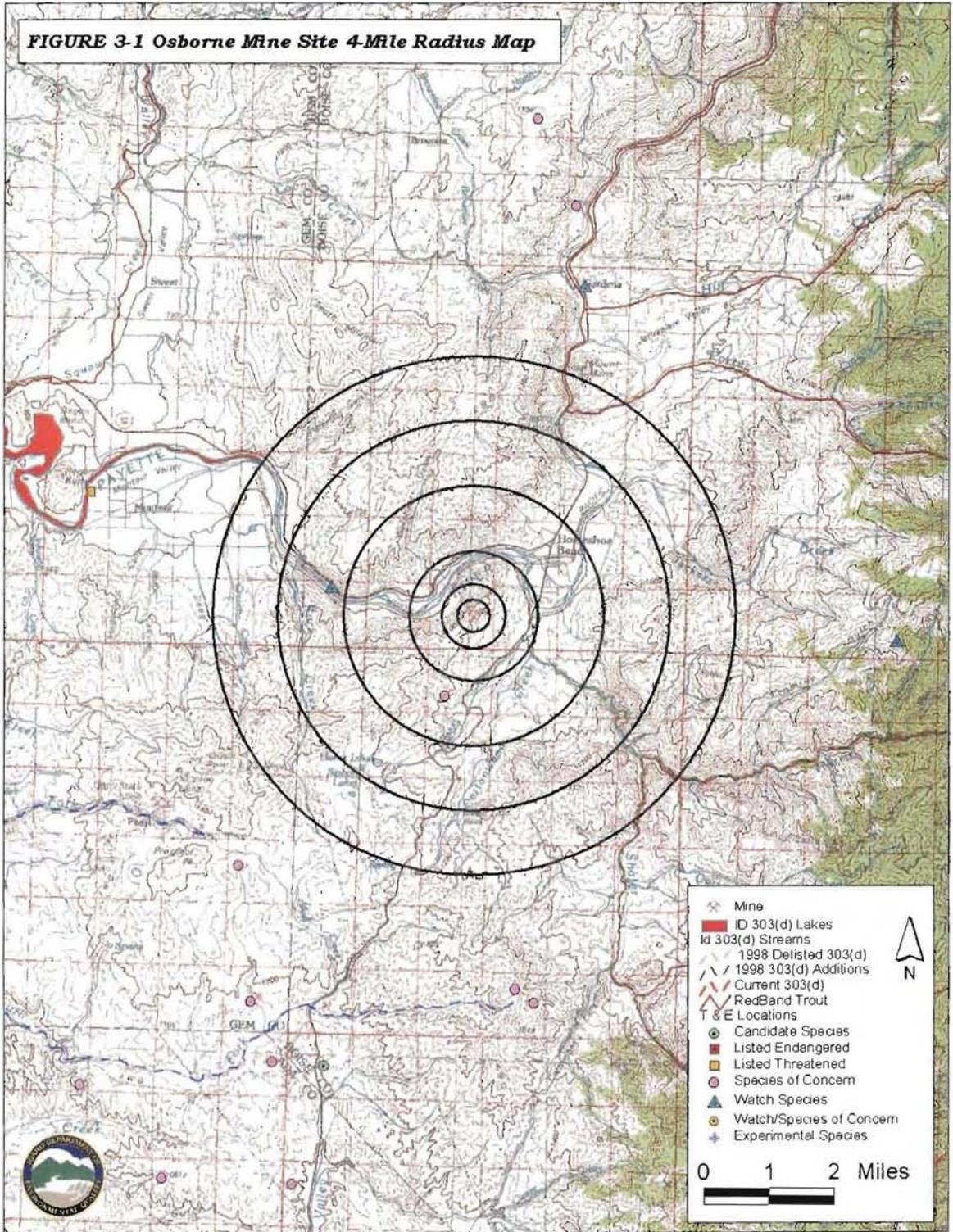
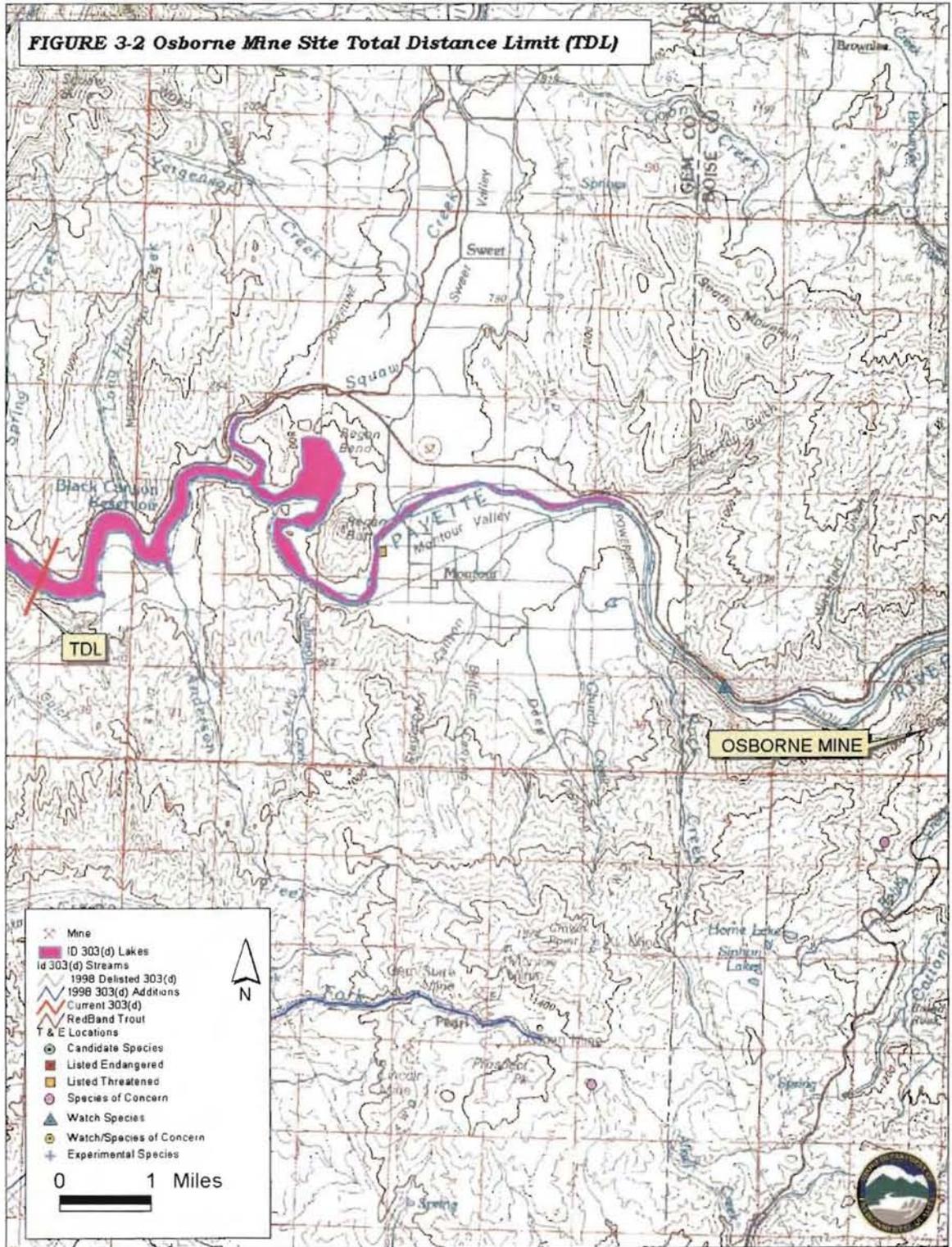


FIGURE 3-2 Osborne Mine Site Total Distance Limit (TDL)



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APPENDIX A
SITE PHOTOGRAPHS
OSBORNE MINE



Photo No. 1

Looking east towards the former Osborne Mine shaft and waste dumps. Vegetation has covered up and stabilized most of the waste dumps. The dry creek bed is present in the foreground.



Photo No. 2

Looking west towards the concrete foundations and remnants of the inclined shaft of the Osborne Mine.



Photo No. 3

Looking Northeast towards the concrete remains of the former shaft at the Osborne Mine. Ephemeral stream is in the background.



Photo No. 4

Looking downhill onto the caved-in opening of the former shaft. No water was observed in or around the former shaft opening.



Photo No. 5

Looking north towards the waste rock pile (in the foreground) located approximately 400 yards up the gulch from the Osborne Mine shaft. The mine survey marker is located on the slope in the background. The deer antler was found on this hillside.