

**BAY STATE GROUP  
PRELIMINARY ASSESSMENT REPORT  
OWYHEE COUNTY, IDAHO**

**STATE OF IDAHO  
DEPARTMENT OF ENVIRONMENTAL QUALITY**

December 2002

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



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

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JUL 14 2003

D.E.Q. STATE WASTE  
MANAGEMENT & REMEDIATION DIVISION

July 9, 2003

Reply To  
Attn Of: ECL-115

L. Heagney  
P.O. Box 1926, M-416  
Spartanburg, SC 29304

Dear Mr. Heagney:

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

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

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

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

Sincerely,

Ken Marcy  
Site Assessment Manager

Enclosure

cc: Bruce Schuld, Idaho Department of Environmental Quality  
Kenneth Henderson  
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

## 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 Bay State Group site located near South Mountain, Idaho in Owyhee County. DEQ completed PA activities in accordance with the goals listed below.

The specific goals for the Bay State Group 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: Bay State Group

CERCLIS ID No.:

Location: Owyhee County, Idaho

Latitude: 42° 45' 06"N

Longitude: 116° 55' 29"W

Legal Description: Section 4, Township 8S, Range 5W, Boise Meridian

Congressional District: Idaho

Site Owner: L. Heagney  
P.O. Box 1926, M-416  
Spartanburg, SC 29304

Site Contact: Kenneth Henderson  
210 N 2450 E  
Richfield, UT 84701  
(435) 201-9798

## 2.2. SITE DESCRIPTION/OWNERSHIP HISTORY

Bay State Group is a collection of former silver mines and prospects located in Owyhee County, Idaho, approximately 18 miles southeast of Jordan Valley, Oregon and 20 miles south of Silver City, Idaho (Figure 2-1). The site is located immediately west of the old town site of South Mountain above Williams Creek. The Bay State Group of patented claims includes the Illinois, Tennessee, Massachusetts, Michigan and a portion of the Washington, Idaho and Oregon claims (Sorenson, 1927). Bay State Group includes the Bay State shaft, tunnel and upper tunnel; the Independence shaft; the Grant incline; the Illinois shaft; and several lesser, unnamed prospects (Figures 2-2 and 2-3). Apparently, these mines were developed to access the same sulfide-rich metamorphosed sediments as the Sonnemann Mine located 0.75-mile southeast of the Bay State Group.

According to Sorenson (1927, p. 40), the mineralized vein of the Bay State shaft and tunnels lies entirely within a limestone formation but "irregular replacement of the limestone was noted". The oxidized ore was worked by vertical shaft to a depth of 75 feet and later accessed from a tunnel driven from creek level (Bell, 1906). Bell described the ore body, exposed in the Lower Bay State tunnel, as clean sulfide ore measuring 100 feet long and one to eight feet wide which assayed as ten percent lead, 18 ounces of silver, three dollars of gold and eight percent zinc. DEQ identified a second shaft (not noted by Sorenson) located approximately 100 feet due north from the upper tunnel and believed to be developed to a depth of 50 feet based upon the dimensions of the dump. The Grant incline was 100 feet deep and at least partially developed in decomposed galena and lead carbonate (*ibid.*). No historical information was available for the Independence shaft. DEQ located the collapsed shaft and estimated the workings to be approximately 125 feet deep, based upon the dimensions of the dump. Sorenson (p. 41) describes the "shallow" construction of the Illinois shaft, but does not detail any production figures.

Classification of ore deposits in the South Mountain Mining District reveals typical contact metamorphic replacement and characteristic vein replacement deposits (*ibid.*). The western portion of Williams Creek, including the Queen of the Mountains and Kentuck claims, the Bay State Group, and the northernmost Tunnel Group, contains sulfide deposits from contact metamorphism of limestone units and the underlying granodiorite. The metamorphosed sediments appear to be a roof pendant in the granodiorite intrusive.

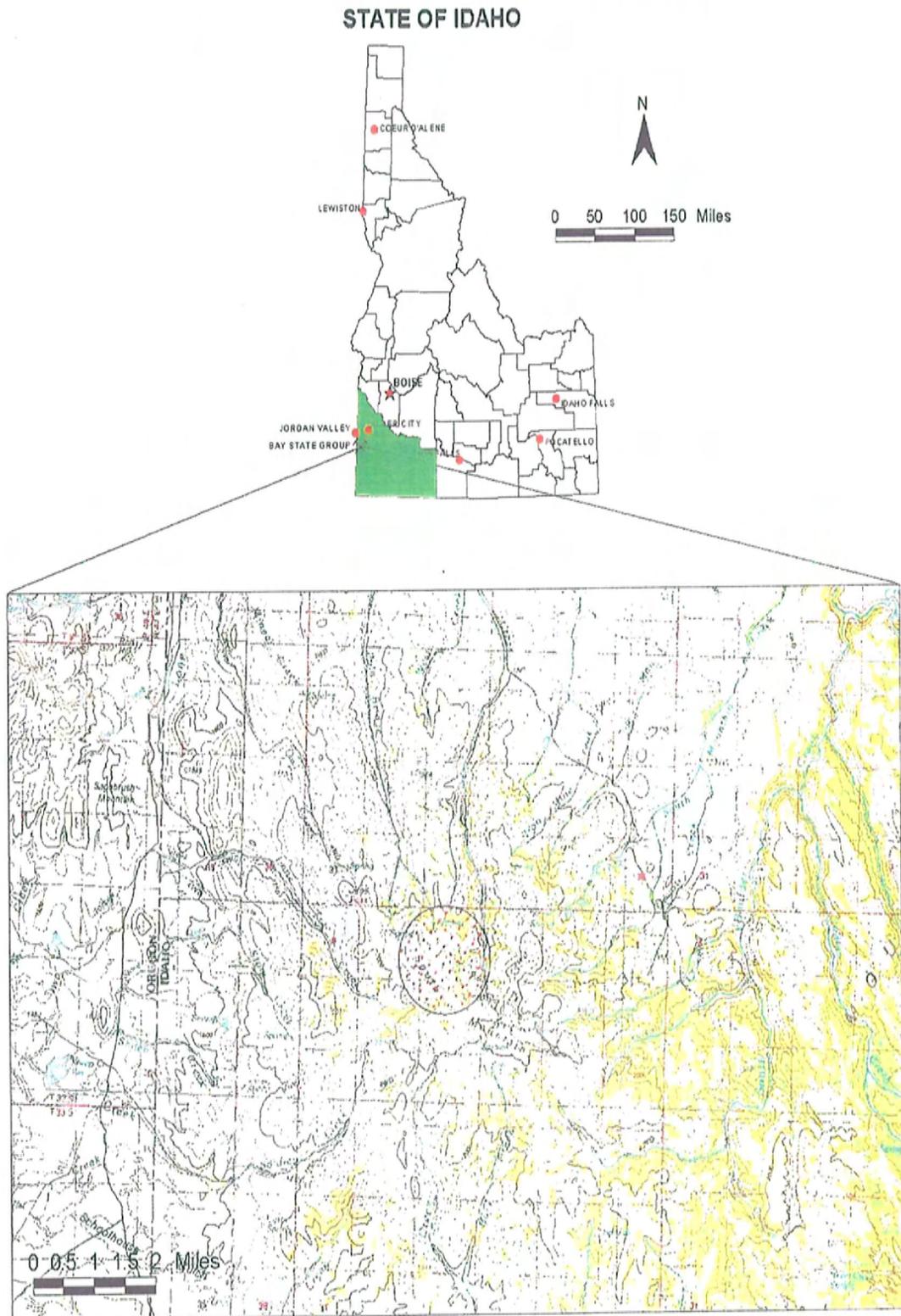
Ownership history of the Bay State Group is unclear. Two major veins of gold, silver and lead were discovered in 1868 on South Mountain but were not developed until 1869. In 1874, a small smelter was established in the townsite of Bullion City, later renamed South Mountain, which lies 0.10 miles east of the Bay State Group. Early ownership of the Bay State Group is vague, but "in the fall of 1874, San Francisco parties bought up the more important mines and incorporated as the South Mountain Consolidated Mining Company. The Company opened up the Golconda, Bay State, Yreka and other mines..." (V.P. Jennings, unpublished manuscript). Failure of the

Bank of California in on August 26, 1875 effectively shut down mining on South Mountain (ISHS, 1996).

In 1926, the Uida Consolidated Mines Company held the bond and option on the property of the South Mountain Mining Company but records fail to illuminate any mining operations conducted by this new company. Between August 9, 1940 and November 30, 1946, the South Mountain Mining Company was operating mine properties in the Golconda Group, but it is unclear whether the Bay State Group ever operated again, following the collapse of the Bank of California in 1875. Currently, L. Heagney of Spartanburg, South Carolina owns all seventeen (17) patent claims within the South Mountain Mining District.

FIGURE 2-1

Fig. 2-1. Site Vicinity Map; Bay State Group



### 2.3 SITE OPERATIONS AND WASTE CHARACTERISTICS

The mineral deposits of the Bay State Group consist chiefly of lead, silver and zinc with an appreciable amount of gold (Sorenson, 1927). Oxidized zones of ore, most likely sulfide vein material within limestone/marble stratified units, were mined from the Bay State Group. Nineteenth century milling and smelting technologies restricted ore extraction to the oxidized portion of the vein material. Apparently, twentieth century milling practices, employed during subsequent operations at Golconda properties, were never applied to the Bay State Group.

The largest operation within the Bay State Group appears to be the Bay State shaft, upper and lower tunnels. The previously unidentified open upper shaft (Photo Mvc-842) and collapsed upper tunnel (Photo Mvc-840) are located along the westside of Williams Creek at an estimated elevation of 6,760 feet above mean sea level.

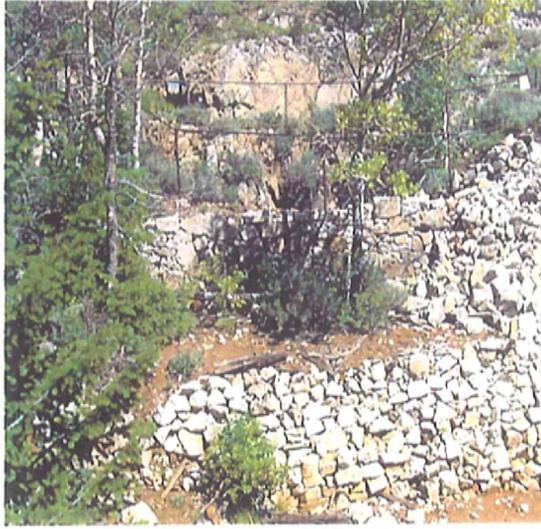


Mvc-842  
Upper Shaft

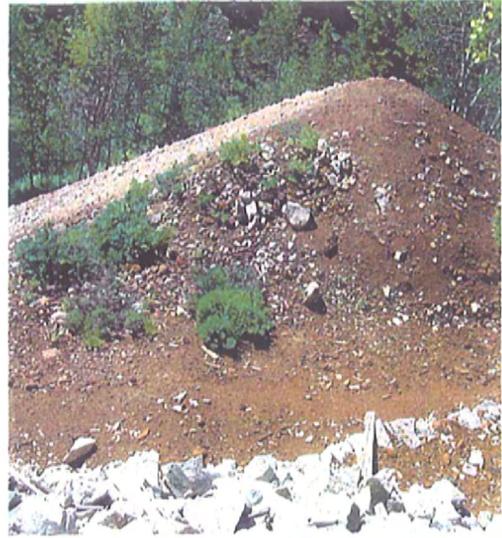


Mvc-840  
Upper Tunnel

The open shaft (Photo Mvc-843), noted by Sorenson, includes a large dump. The collapsed lower tunnel, not pictured, is believed to be located near the base of the large dump (Photo Mvc-841) of this shaft.



Mvc-842  
Upper shaft



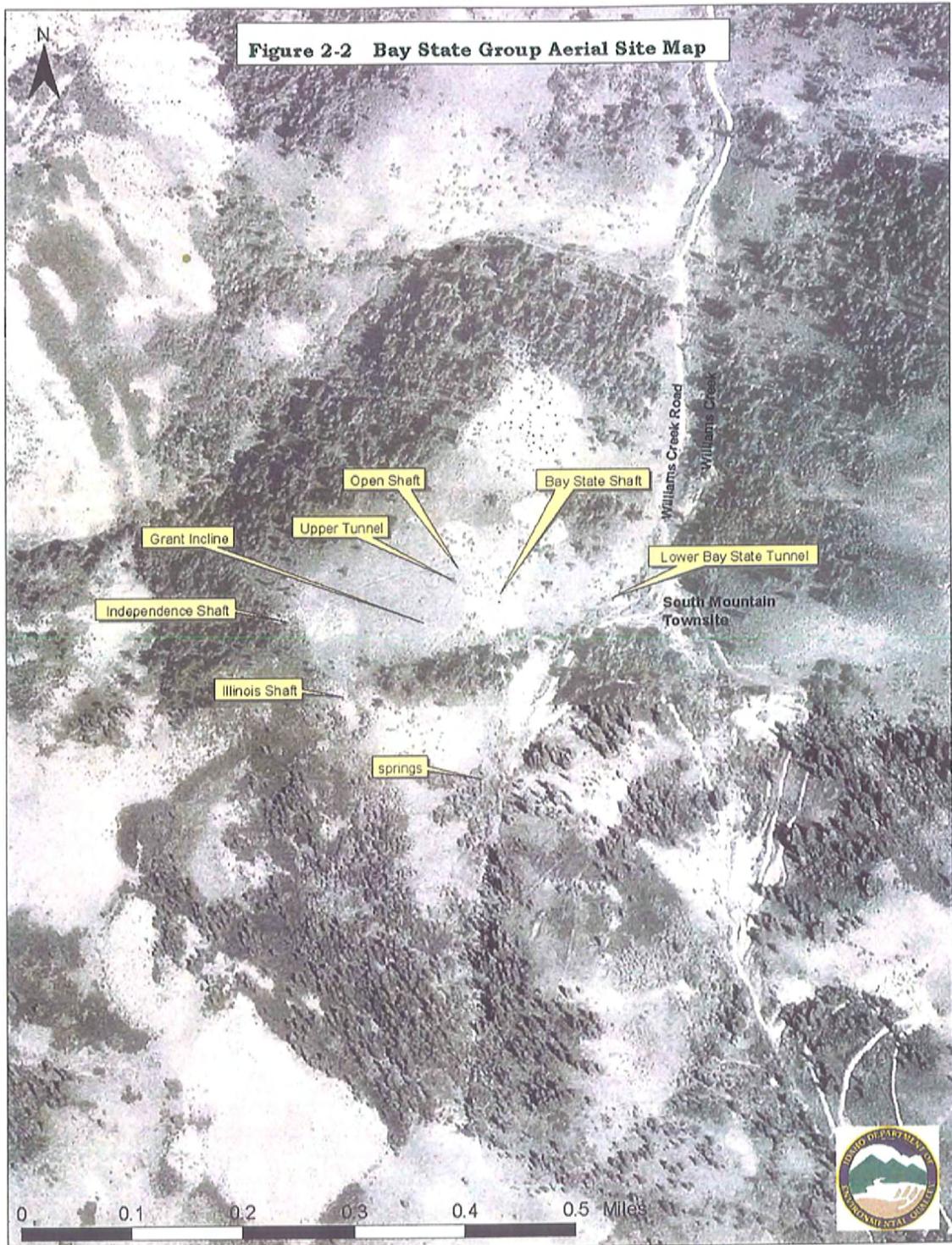
Mvc-840  
Upper Tunnel

The only previous known fieldwork at the Bay State Group was conducted by the Idaho Geological Survey (Bennett, et al, 2000). Bennett conducted site investigations of the mines within the South Mountain Mining District.

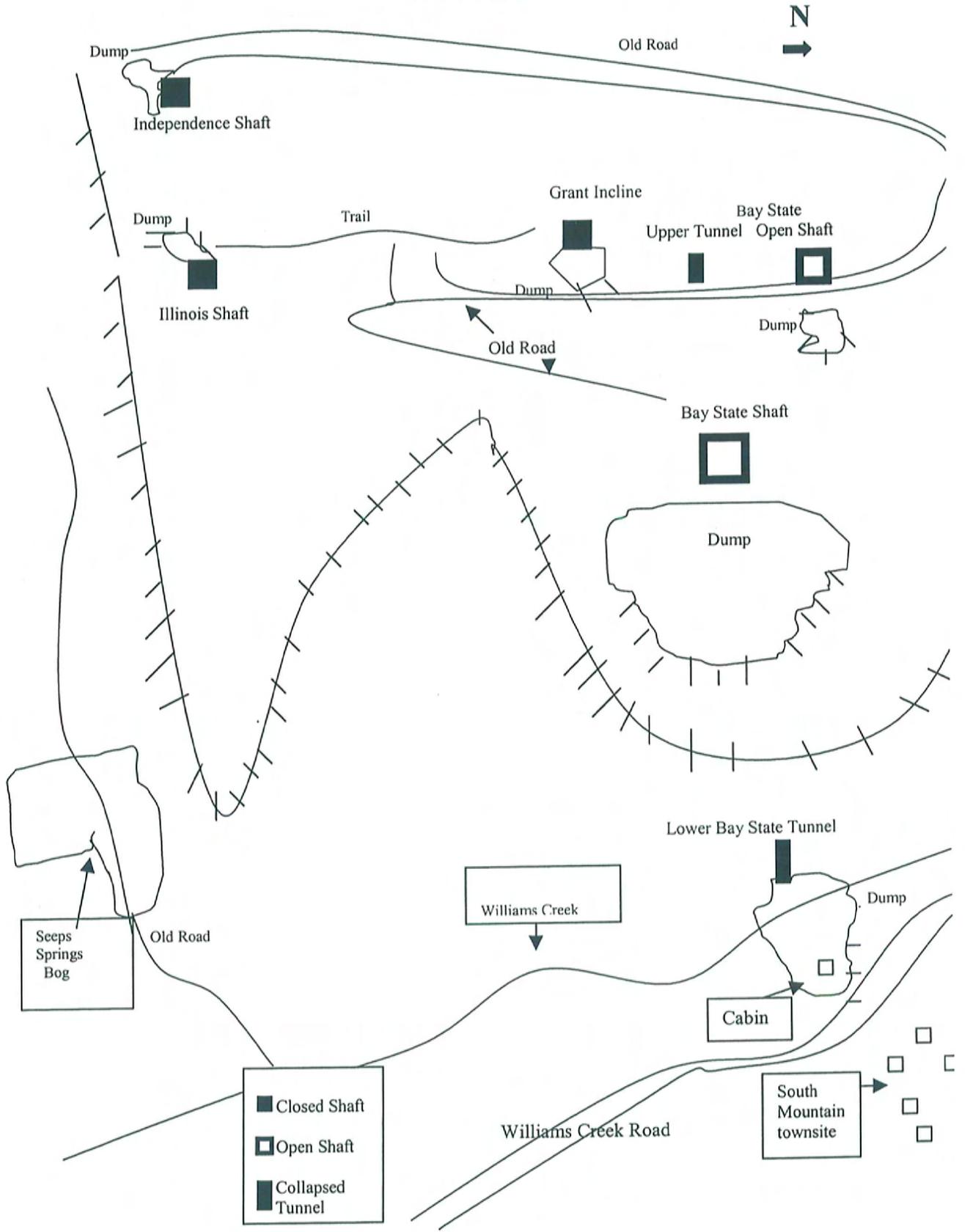
#### 2.4 DEQ ACTIONS

The DEQ conducted a site visit on July 2, 2002. The owner of the property, L. Heagney, was not present during the site visit. The site is not fenced and is readily accessible from the adjacent South Mountain Road, though the terrain is steep. Site features included an incline shaft (Grant Incline), four shafts (Independence, Illinois and Bay State (2)), collapsed tunnels (Bay State), waste rock dumps, and a cabin in good condition, located on the dump of the lower tunnel (DEQ, Figure 2-3). All of the workings show evidence of recreational usage (hikers) and animal grazing is evident except near the Bay State shafts and upper tunnel, due in part to the steep terrain.

Figure 2-2



**SITE MAP  
FIGURE 2-3**



### 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

South Mountain has been described as a continuation of the Owyhee Range (Lindgren, 1900) and an isolated uplift (Bell, 1906). Sorenson (1927) stated the South Mountain uplift bears no direct connection to the Owyhee range. The highest summits of the South Mountain Range seem to follow the strike of the metamorphosed sediments while the long axis of the range strikes in a northwest-southeast direction and parallels the Owyhee Range. South Mountain measures 15 miles northwest-southeast with a width of approximately 10 miles. The elevation of South Mountain is 7,801 feet while Jordan Valley, Oregon, which lies in the valley to the north, has an elevation of 4,200 feet. The regional relief is about 3,400 feet. South Mountain's topography is similar to the Silver City area. Streams with steep gradients and hills with steep slopes are common but summits tend to be rounded. Williams, Mill, South Mountain and Willow Creeks drain the north slopes of South Mountain. Williams Creek, which heads about 200 feet vertically and 500 feet horizontally from South Mountain, is a permanent stream from its source to its end during all seasons (ibid.).

The stratified rocks of South Mountain are largely metamorphosed sediments. Lindgren (1900) mapped the South Mountain sediments as Carboniferous age and correlated them with the Seven Devils series from an outcrop exposed near Huntington, Oregon located 115 miles north from the site. The metasediments are composed of "more than 4,000 feet of garnetiferous-quartz-mica schist, fine-grained quartzite, and marble, which were tightly folded and later intruded and surrounded by a grano-diorite-quartz-monzonite magma " (ibid. p.10). Bennett and Galbraith (1975) suggested the granitic rocks "appear similar to typical Idaho-Batholith". Intrusion of granitic magma created extensive contact metamorphism throughout the South Mountain Mining District and appears to correlate to the sediments of the Flynt District to the north (Piper and Laney, 1926).

The constituent sediments of South Mountain were probably metamorphosed during the Upper Jurassic-Lower Cretaceous with the intrusion of granodiorite. Subsequent erosion of the metasediments and granodiorite enabled outpouring of Miocene flood basalts (Christiansen and Lipman, 1970). Following deposition of basalts, the area was again subjected to uplift. The present topography resulted from glaciation and stream erosion. Cirques are developed only on the north side of South Mountain. The streams, including Williams Creek, are reworking the glacial debris (Sorenson, 1927).

Ground water exists locally within fractures in the bedrock and within the unconsolidated deposits. Several springs are located within 0.50 miles from the Bay State mine, including a boggy area adjacent to an old road leading to the

Independence Shaft. Ground water was not observed discharging from any of the workings within the Bay State Group.

No precipitation data is available for the Bay State Group or South Mountain. Silver City, located 20 miles north and comparable in elevation to this site, maintained data from 1978 to 2000. The mean annual precipitation for this period was 21.76 inches, the mean annual snowfall was 87.9 inches and the maximum 24-hour event was 2.75 inches (WRCC, 2002).

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

### 3.2 AIR MIGRATION PATHWAY

The nearest individual to the Bay State Group lives 6.5 miles north from the site. A Bureau of Land Management (BLM) lookout tower at the summit of South Mountain, located 2.0 miles south, is manned by one individual during the fire season which runs from June through October each year.

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, though several unnamed prospects contain exposed vein material. The likelihood of aerial dispersal from the dumps and prospects appears remote.

### 3.3 SOIL EXPOSURE PATHWAY

Access to the Bay State Group is unrestricted though the terrain is quite steep. The Williams Creek Road is maintained during the fire season to allow ready access to the BLM lookout tower on South Mountain. Evidence of recreational use (hikers), abundant sign of cattle activity near the Independence and Illinois shafts and vandalism to the fences surrounding the Bay State shafts illustrates the ease of access to this site. There are no workers or residences within 200 feet of the site. The nearest residence is 6.5 miles north of the site. A BLM lookout tower at the summit of South Mountain, located 2.0 miles south, is manned by one individual during the fire season (June through October). No schools or day-care facilities are located within 200 feet of the site.

Ore and/or waste rock, primarily sulfides, are piled in close proximity to each of the workings. The lower Bay State tunnel is collapsed, but the tunnel and associated dump lie within the Williams Creek floodplain. A well maintained cabin is located on the dump on the east side of the creek. However, no information is available concerning the occupancy status of the cabin.

### 3.4 SURFACE WATER MIGRATION PATHWAY

The site slopes east toward Williams Creek. An unnamed northeasterly flowing tributary delineates the northern boundary of the Group from the Tunnel claims. Sorenson (1927, Plate IIA) identified this tributary as Wessels Creek, though current topographic maps do not name it. An easterly flowing unnamed creek bisects a steep side canyon between the Illinois and Bay State shafts.

Water was observed flowing from several seeps in a boggy area due east from the Illinois shaft and eroding the old mine road. One Probable Point of Entry (PPE) is erosion of the Lower Bay State Tunnel's dump, which is bisected by Williams Creek.

Soil survey data for the site is unavailable but Sorenson (1927) suggests glacial till is an integral component. Direct observation at only the Lower Bay State Tunnel revealed a coarse-grained sandy loam underlain by characteristic glacial debris. Direct observation of the remainder of properties revealed a coarse-grained sandy loam underlain by float and country rock. Based upon observation during the site visit, moderate to high infiltration rates would be expected near the Lower Tunnel and low to moderate infiltration elsewhere across the site.

The maximum 24-hour rainfall event for Silver City was 2.75 inches (WRCC, 2002). From its amphitheater-like headwater basin, Williams Creek cuts a steep gradient until reaching its intersection with the East Fork of Williams Creek at the old townsite of South Mountain. Based upon the topography, climate and observations at the site, the potential for flooding of the Lower Tunnel area would appear to be moderate, while the remainder of the site would be low.

There are no drinking water intakes within the TDL. Traversing north, the surface water pathway is enjoined by several unnamed creeks before West Creek merges at 5.75 miles, Pole Bridge Creek merges at 7.25 miles, and it flows into Jordan Creek at 9.5 miles from the site. Jordan Creek continues within the 15-mile TDL for another 4.5 miles to the northwest. Jordan Creek is listed by DEQ as a §303(d) stream meeting a total maximum daily load for pesticides, oil and grease, bacteria, sediment and metals; however, metals are not listed as a pollutant after the confluence of Jordan Creek and Williams Creek.

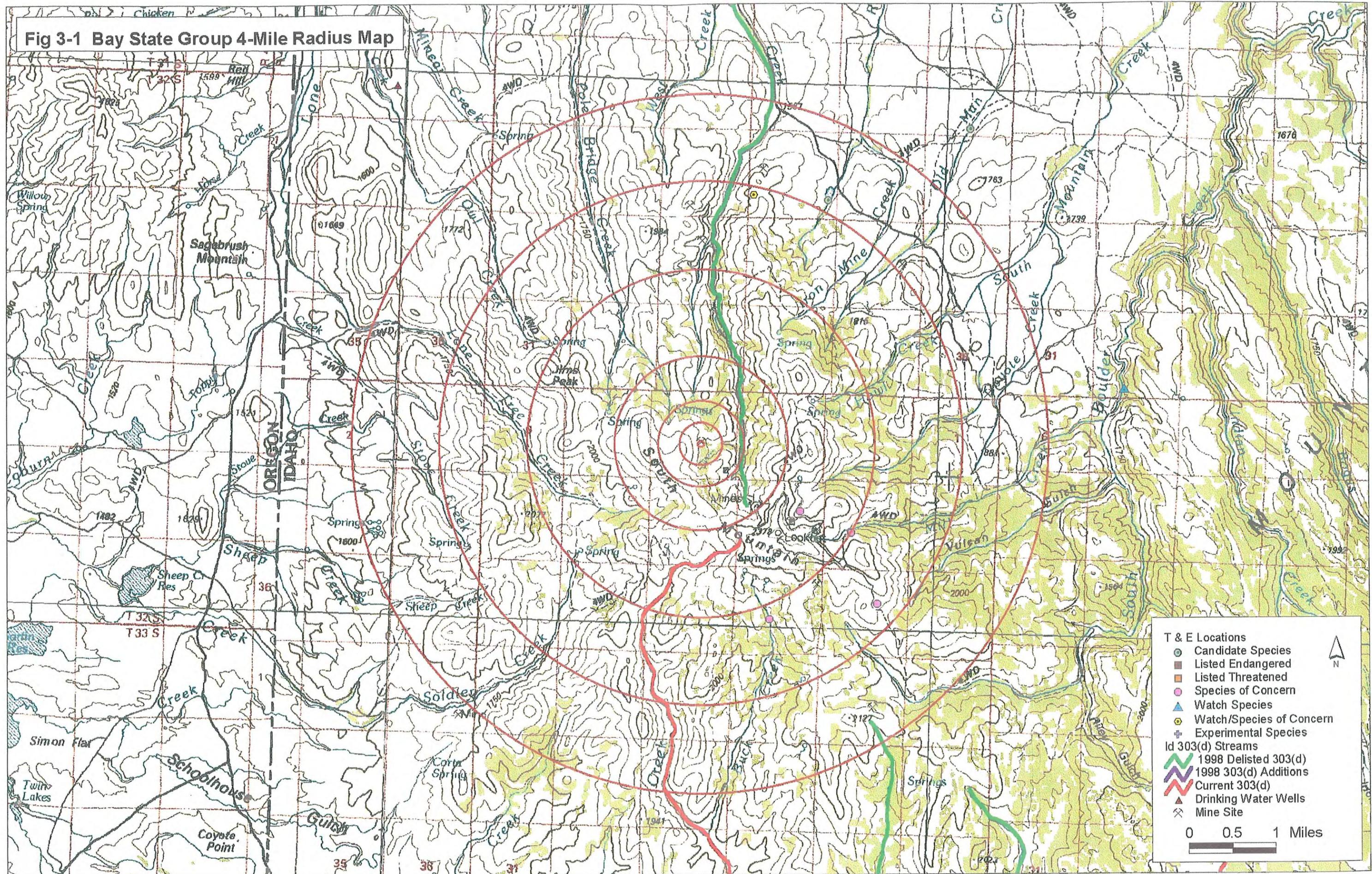
Commercial and subsistence fishing are not conducted within the surface water TDL. Sport fishing was observed in Williams Creek between the old town site of South Mountain (0.10 miles east) and West Creek. Fish catch data, however, could not be determined.

One plant species, listed as sensitive (F&G, 2002), was identified at four locations within a 4-mile radius of the Sonnemann Mine. The Least Phacelia (common name), *Phacelia Minutissima*, was identified at sites 1.10 miles and 1.80 miles southeast, 1.95 miles south, and 2.5 miles southeast from the site. One threatened species was identified within a 4-mile radius of the Mine. The Western Toad (common name),

Bufo Boreas, was identified 3.0 miles north along Williams Creek (USDA Forest Service, 1994). According to the U.S. Fish and Wildlife Service (2002), there are no wetlands inventoried within the TDL.

The use of surface water for watering of livestock and wildlife as well as crop irrigation is expected. Direct observation did not reveal any ground water discharge from any of the shafts or tunnels, though Williams Creek actively erodes the Lower Bay State Tunnel's dump.

Fig 3-1 Bay State Group 4-Mile Radius Map



**T & E Locations**

- Candidate Species
- Listed Endangered
- Listed Threatened
- Species of Concern
- ▲ Watch Species
- Watch/Species of Concern
- ✦ Experimental Species

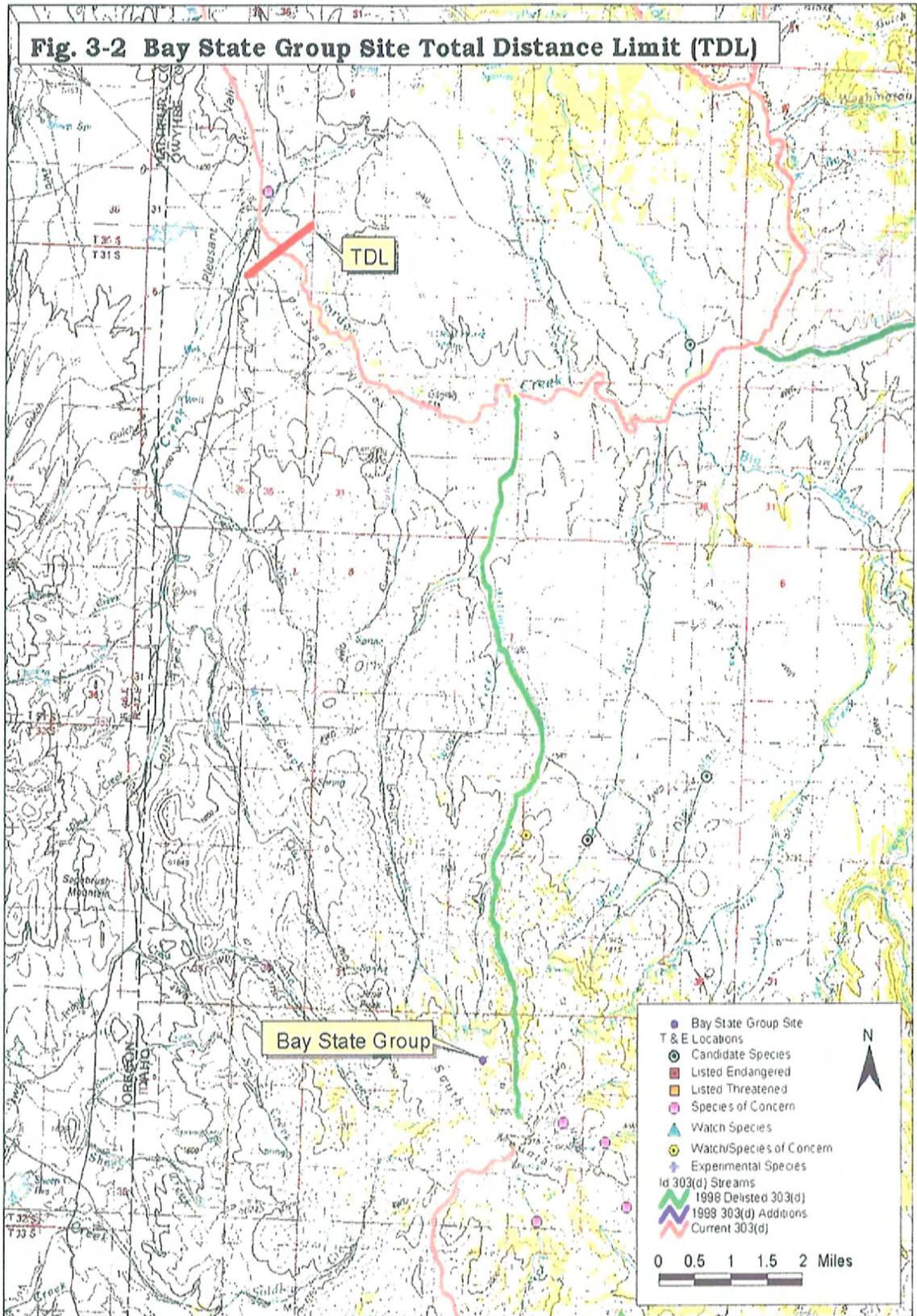
**Id 303(d) Streams**

- 1998 Delisted 303(d)
- 1998 303(d) Additions
- Current 303(d)

▲ Drinking Water Wells  
✦ Mine Site

0 0.5 1 Miles

FIGURE 3-2



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**APPENDIX A**  
**PHOTO LOG**  
**BAY STATE GROUP**

- Mvc-840 View to west, caved shaft west side of Williams Creek Road. Partially enclosed by fencing,
- Mvc-841 View to west, waste rock dump (dump) of mineshaft, shown in photo Mvc-842. Marble is the light colored rock in foreground.
- Mvc-842 View to west, open shaft, partially enclosed by barbed wire fence. Substantial dump shown in Mvc-841.
- Mvc-843 View to west, open shaft, enclosed by fence and posted with a warning sign ("Keep Out"). Marble reinforced retaining walls visible in foreground. Very large dump, not pictured, lies to west of shaft.