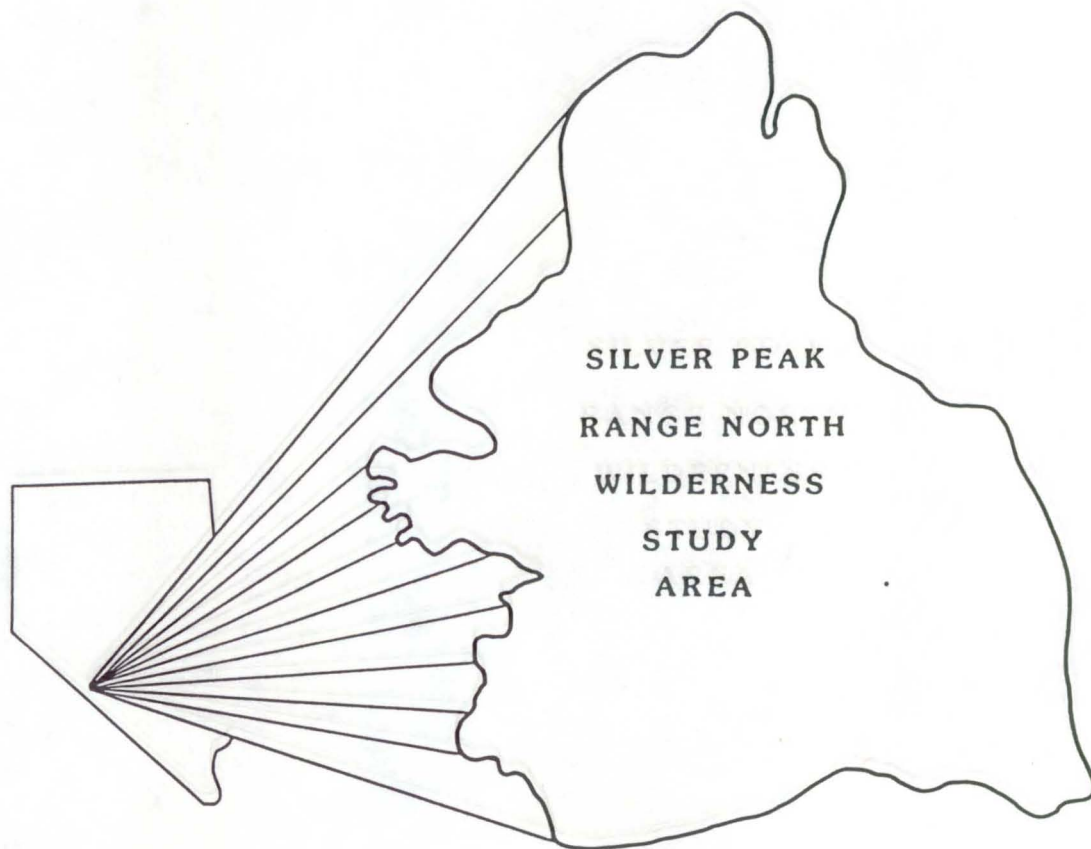


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Mineral Land Assessment/1987  
Open File Report

# Mineral Resources of the Silver Peak Range North Wilderness Study Area, Esmeralda County, Nevada



BUREAU OF MINES

UNITED STATES DEPARTMENT OF THE INTERIOR

MINERAL RESOURCES OF THE SILVER PEAK RANGE NORTH WILDERNESS  
STUDY AREA, ESMERALDA COUNTY, NEVADA

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## PREFACE

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and U.S. Bureau of Mines to conduct mineral surveys on U.S. Bureau of Land Management administered land designated as Wilderness Study Areas ". . . to determine the mineral values, if any, that may be present . . . ." Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a U.S. Bureau of Mines mineral survey of the U.S. Bureau of Land Management Silver Peak Range North Wilderness Study Area (NV-060-338), Esmeralda County, NV.

This open-file report will be summarized in a joint report published by the U.S. Geological Survey. The data were gathered and interpreted by U.S. Bureau of Mines personnel from Western Field Operations Center, East 360 Third Avenue, Spokane, WA 99202. The report has been edited by members of the Branch of Mineral Land Assessment at the field center and reviewed at the Division of Mineral Land Assessment, Washington, DC.

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## SUMMARY

U.S. Bureau of Mines personnel studied the 33,900-acre Silver Peak Range North Wilderness Study Area (NV-060-338), in order to evaluate its identified mineral resources. The area studied lies between the towns of Silver Peak and Dyer, about 40 miles southwest of Tonopah, in Esmeralda County, Nevada.

There are no producing mines in the area studied. However, development of Sunshine Mining Company's Sixteen-to-One silver-gold mine, located in the Silver Peak mining district near the eastern edge of the study area in the early 1980's, has stimulated recent interest. The Sunshine Mining Company claimed two sites within the study area in 1985. Also, Intermountain Resources, Incorporated, located a group of claims at a prospect along the west side of the study area in the Dyer mining district, and in 1986, began drilling. Other claimants are holding two other claim groups by assessment. At the five currently (1987) held sites, precious metals occurrences are being investigated. There are no patented mining claims or mineral leases in the study area.

The study area is underlain by Tertiary-age andesitic to rhyolitic flows, sediments, tuffs, and dikes of the Silver Peak volcanic center. These rocks intrude or cover Paleozoic-age calcareous metasedimentary beds and Mesozoic-age granitic rocks and are covered over much of the study area by Tertiary-age latite. Fractures and faults, the main controls for epithermal vein emplacement, are along two zones that transect the andesitic to rhyolitic volcanic and calcareous metasedimentary rocks. The two zones cross the study area between the Silver Peak and the Dyer mining districts. Thirteen mineral prospects containing over 40 veins were identified along the two zones. Additional undiscovered prospects may be present.

No mineral resources were identified at the prospects found in the Silver Peak Range North Wilderness Study Area. However, their similarity to the deposits in the Silver Peak and Dyer mining districts, plus the presence of pathfinder elements and rock alteration, suggest that precious metal resources may be at depth. Additional mapping and sampling, followed by trenching or drilling, are needed to determine if resources are present. If resources are identified, then economic, engineering, and financial analyses should be made.

## INTRODUCTION

This report describes the USBM (U.S. Bureau of Mines) portion of a cooperative study with the USGS (U.S. Geological Survey) to evaluate mineral resources and potential of the Silver Peak Range North WSA (Wilderness Study Area) at the request of the BLM (U.S. Bureau of Land Management). The USBM examines individual mines, prospects, claims, and mineralized zones, and evaluates identified mineral and energy resources. The USGS evaluates potential for undiscovered resources based on areal geological, geochemical, and geophysical surveys. Results of



the investigations will be used to help determine the suitability of the WSA for inclusion into the National Wilderness Preservation System. Although the immediate goal of this and other USBM mineral surveys is to provide data for the President, Congress, government agencies, and the public for land-use decisions, the long-term objective is to ensure the Nation has an adequate and dependable supply of minerals at a reasonable cost.

### Setting

The Silver Peak Range North Wilderness Study Area (NV-060-338), which contains 33,900 acres, is in the northern part of the Silver Peak Mountain Range between the towns of Silver Peak and Dyer, NV (fig. 1 and pl. 1). It is bounded to the north and west by Fish Lake Valley, to the east by the valley between Red Mountain and Piper Peak, and to the south by McAfee Canyon. Access is by improved and unimproved roads from State Highway 47 on the east and State Highways 6 and 3A on the west.

Elevations range from about 5,600 ft (feet) near the mouth of Icehouse Canyon to 9,450 ft at the summit of Piper Peak, the highest point in the study area. Water is scarce in the study area, reflecting the low annual precipitation of this high desert country. There are no permanent streams, only a few small springs in Icehouse Canyon and around the edges of the study area. Most precipitation falls between December and May; some may fall as snow. Vegetation varies with elevation. At low elevation sparse grass, sage, and greasewood flourish. Growing at higher elevations, particularly on the flat-topped ridges in the vicinity of Piper Peak, are grass, pinyon pine, and juniper.

### Previous Studies

Much has been written about the geology and mineral deposits located to the east of the study area in the Silver Peak mining district. Very little has been written about the geology and mineral deposits located on the west side of the study area in the Dyer mining district. Spurr (1906) described the Silver Peak mining district in some detail and the Dyer mining district in little detail. Lincoln (1923) updated the descriptions of those districts. Between 1971 and 1976, Krauskopf (1971), Robinson and Crowder (1973), Stewart and others (1974), and Robinson and others (1976), mapped the geology of the study area from aerial photographs. Updated summary descriptions of the geology and mineral deposits in the Silver Peak and Dyer mining districts were published by Albers and Stewart (1972), and included descriptions of the Nivloc, Mohawk, and Sixteen-to-One mines. Keith (1977), described the geology and mines near Red Mountain. Earnest (1984), and Young (1984), described the Sixteen-to-One mine in detail. Under BLM contract, Great Basin GEM Joint Venture (1983), prepared a GEM (geology, energy, and minerals) report on a 170,000-acre area that includes the study area; no field work was done. In the GEM report, the study area was classified as having moderate favorability with low confidence for metallic mineralization.

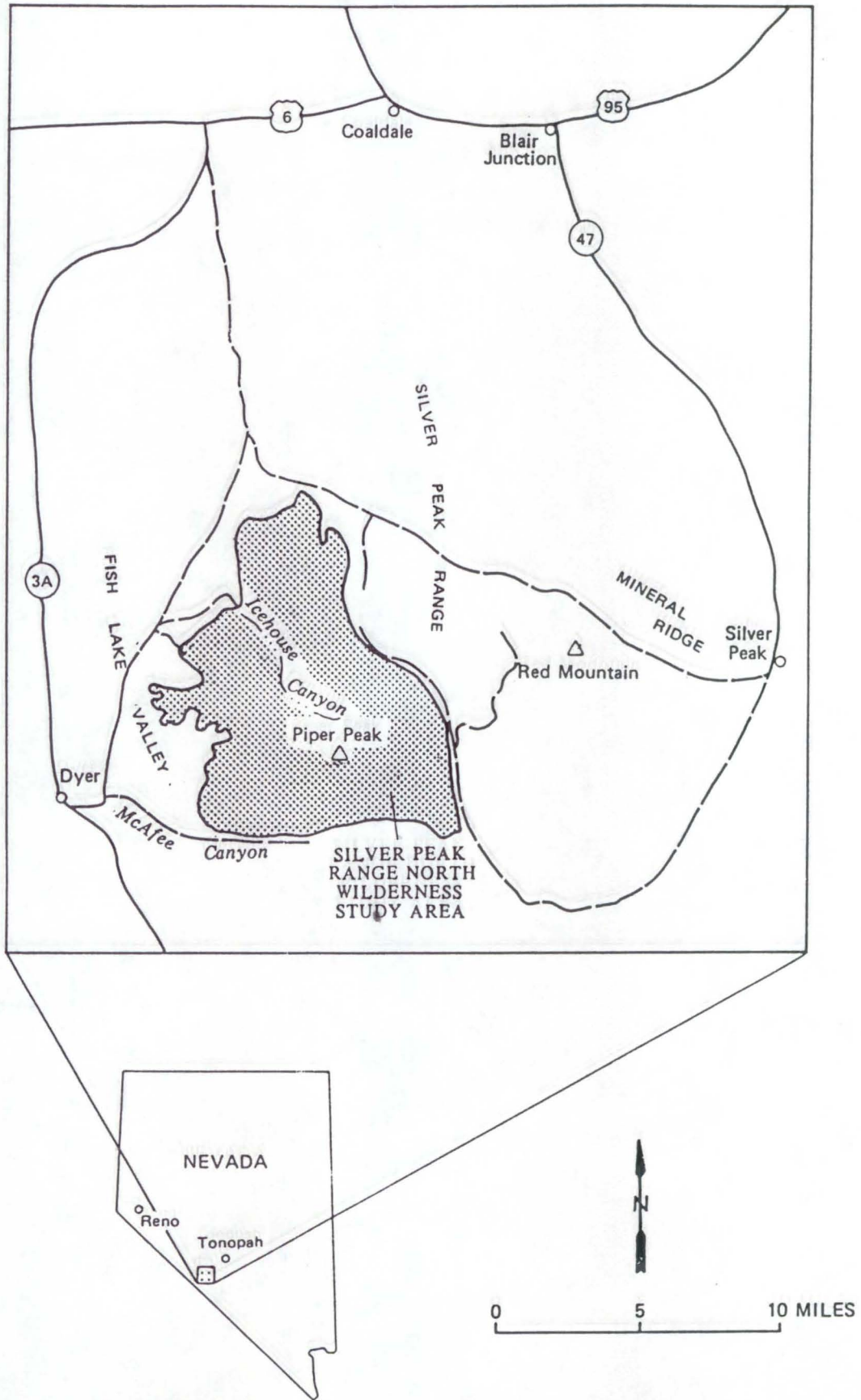


FIGURE 1.— Location of the Silver Peak Range North Wilderness Study Area (NV-060-338), Esmeralda County, NV



## Present Study

Personnel from the USBM Western Field Operations Center conducted the prefield, field, and report writing phases of this study during 1985, 1986, and 1987. Prior to the field work, claim and minerals data were obtained from Esmeralda County records, BLM publications, and claim owners. The field studies done during April 1985 and July 1986 involved searches for all mineral prospects; 13 were found and sampled. Eleven were found within the study area, and two outside. Two nearby sites (pl. 1, nos. 4 and 6) were studied because they are along zones that extend across the area; both may have resources at depth.

USBM personnel collected 88 rock samples. Data for an additional 125 rock and soil samples were supplied by claim owners. The USBM rock samples were crushed, split, and checked for radioactivity and fluorescent minerals at the Western Field Operations Center, and then sent to the USBM Research Center in Reno, NV, and Geochemical Services, Incorporated, in Sparks, NV, for analyses. Selected samples were analyzed by semiquantitative spectrography for concentrations of 40 elements <sup>1/</sup>. Gold and silver contents of the rock samples were determined by fire assay, or fire assay combined with ICP (inductively coupled plasma analysis) at detection limits of 0.005 ppm (parts per million) and 0.03 ppm, respectively. The amounts of base metals were determined by atomic absorption or ICP methods. The detection limit for arsenic was 30 ppm, copper 6 ppm, mercury 0.5 ppm, tungsten 30 ppm, and lead and zinc 10 ppm. All 88 USBM samples averaged about 0.12 ppm silver, 30 ppm copper, 40 ppm lead, 110 ppm zinc, and 70 ppm arsenic. Values of as much as 0.02 oz/ton (troy ounce per ton) gold, 2.1 oz/ton silver, 1.0 percent copper, 2.6 percent lead, 0.4 percent zinc, 0.07 percent arsenic, and 0.007 percent tungsten were obtained. These values are from scattered sites. The data are on file at the U.S. Bureau of Mines, Western Field Operations Center, Spokane, WA 99202.

USBM rock samples were of two types: chip - a measured series of rock chips taken in a continuous line across a mineralized zone or other exposure; and grab - rock pieces taken unsystematically from a dump, stockpile, or of float (loose rock lying on the ground).

Resources are classified according to U.S. Bureau of Mines/U.S. Geological Survey Circular 931.

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<sup>1/</sup> Aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, gallium, gold, iron, lanthanum, lead, lithium, magnesium, manganese, molybdenum, nickel, niobium, palladium, phosphorus, platinum, potassium, scandium, silicon, silver, sodium, strontium, tantalum, tellurium, tin, titanium, vanadium, yttrium, zinc, and zirconium.



## ACKNOWLEDGEMENTS

The author gratefully acknowledges the cooperation and assistance of mining industry representatives Mr. Donald Earnest (Sunshine Mining Company) and Mr. Edward Tomany (Production Exploration Resources, Incorporated). USBM geologists Richard Gaps and David Lipton assisted with prefield and field studies.

## GEOLOGIC SETTING

The study area is a fault-bounded, volcanic center in the Basin and Range physiographic province (Fenneman, 1931). The 3-mi (mile)-wide, 9-mi-long study area has been uplifted relative to the surrounding valleys. Reflecting the rapid uplift, the study area interior is dominated by the narrow, northwest-trending Icehouse Canyon.

Most of the study area is underlain by Tertiary-age volcanic rocks of the Silver Peak volcanic center (Keith, 1977, p. 4). These volcanic rocks intrude and cover a northwest-trending, trough-shaped zone of Paleozoic-age metasedimentary beds. The metasedimentary rocks are also intruded by Mesozoic-age granitic rocks (Albers and Stewart, 1972). Both the volcanic and metasedimentary rocks are covered by latite erupted during the late Tertiary period. The latite that survives erosion covers the ridgetops and parts of Icehouse Canyon. All the rock units are transected by east-trending, arcuate, normal faults.

## MINING HISTORY

The Silver Peak mining district has a long mining history. Gold-bearing veins in metasedimentary rocks were discovered in the district near Mineral Ridge (8 mi northeast of the study area) in 1863 (Albers and Stewart, 1972, p. 56) and mined intermittently until the present (1987). Silver-bearing veins were discovered in the district near Red Mountain (3 mi east of the study area) in 1907 (Albers and Stewart, 1972, p. 56) and mined intermittently until the present. Between 1907 and 1972, 4 million oz (troy ounce) of silver, 18,000 oz of gold, 24,000 lb (pounds) of lead, 8,000 lb of zinc, and 700 lb of copper were produced from the Silver Peak district. Well over 5 million oz of silver and 300,000 oz of gold were produced between 1982 and 1986 (USBM files).

The major mines in the district are the silver mines located near Red Mountain. They include the Sixteen-to-One, Nivloc, Mohawk (Argentite), and Sanger mines (pl. 1). The Sixteen-to-One began operations in 1982 and in 1986 was producing about 800 tons per day of ore from underground workings by trackless, large-blasthole (vertical crater retreat) stoping <sup>2/</sup>. Over 1 million oz/year (troy ounces per year) of silver and over 62,000 oz/year of gold are recovered by cyanide leaching in vats; the base metals are discarded with the tailings (Carrillo and Schilling, 1984, p. 342 and Young, 1984, p. 15). The Sixteen-to-One mine is operated by the Sunshine Mining Company which has an ongoing exploration program for additional precious metals-bearing deposits that can be exploited by the inexpensive methods (\$35 to \$45 per ton) employed at the Sixteen-to-One mine. The company is exploring the study area and has claims at two prospects (pl. 1, nos. 2 and 5).

Silver- and lead-bearing veins were discovered in the Dyer mining district in 1863-1864 (Albers and Stewart, 1972, p. 56). The district has been prospected intermittently until the present, and a few tons of ore worth about \$13,000 were produced by 1912 (Spurr, 1906, p. 84, Albers and Stewart, 1972, p. 47, and Heikes, 1913, p. 1079). In 1983, Mountain Resources, Incorporated began exploring a gold prospect that extends into the study area (pl. 1, no. 3). That work led to a drilling program in 1986.

A search of the Esmeralda County records indicates that only a few mining claims have been located in the study area. Most are currently (1987) held by assessment. The current claims include the Sunshine Springs (pl. 1, no. 2) and Extra Gold claims (no. 5), both held by the Sunshine Mining Company; the eastern part of the Elizabeth prospect, "E" claim block (no. 3), owned by Mountain Resources, Inc.; and the Wildhorse (no. 10) and the American Gold claims (no. 12), which are held by individual claimants. Workings and claim monuments indicate other older claim locations in the study area; however, no evidence of them was found in Esmeralda County records.

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<sup>2/</sup> Trackless, large-blasthole (crater retreat) stoping: Blasting vertical slices of ore between sublevels into the void created by previous blasts, with the broken material being extracted from drawpoints at the bottom of the ore with tire mounted load-haul-dump units and hauled to the surface in trucks (Young, 1984, p. 15).



## MINES AND PROSPECTS

Crossing the study area from the Dyer to the Silver Peak mining district are two mineralized zones that contain precious- and base-metals-bearing, epithermal veins (pl. 1). The two zones are traceable by the veins, rock alteration, and color anomalies (bleached, yellow to orange colored rocks) along them. The zones contain east-trending fractures and faults that provided pathways for hydrothermal solutions. The principal zone (gold and silver) trends east from the DR mine area (no. 4) to the Mud Springs prospect (no. 6) and includes most of the important prospects in the study area. The second zone (gold, silver, copper, lead, and zinc) follows McAfee Canyon from the Wildhorse mine (no. 10) to the Valley View prospect (no. 13). The zones transect both the Paleozoic-age metasedimentary and Tertiary-age volcanic rocks and may extend up into the Tertiary-age latite caprock.

The Paleozoic-age metasedimentary rocks along the zones, consisting of marble, hornfels, and conglomerate beds, are folded, fractured, silicified, and propylitically and argillically altered. The accompanying Tertiary-age volcanic rocks, consisting of andesitic to rhyolitic lava flows, interbeds of water-laid volcanic sediments and tuffs, and andesitic to rhyolitic dikes, are sheared and fractured, and also exhibit propylitic and argillic alteration.

During the USBM study, thirteen mineral prospects containing over 40 epithermal veins were identified along the two mineralized zones. The veins in the study area are along fractures in altered metasedimentary and volcanic rocks, are leached, and are composed mainly of quartz, calcite, or jasperoid that may contain limonite, malachite, and sulfides (acanthite, galena, sphalerite, chalcopryrite, and pyrite). The veins outside the study area near Dyer are also along fractures in altered metasedimentary and volcanic rocks, are leached, and are composed of quartz, calcite, or jasperoid that contain gold and sulfides and sulfosalts of silver and base metals (tetrahedrite, galena, sphalerite, chalcopryrite, and pyrite). The principal vein on the east end of the zones, specifically the vein at the Sixteen-to-One mine, is composed of quartz and calcite that contains silver sulfide (acanthite), base metal sulfides and sulfosalts (pyrargyrite, sphalerite, galena, chalcopryrite, and pyrite), and native gold. The sulfides and sulfosalts occur in stringers that comprise less than 1 percent of the Sixteen-to-One vein. The vein's faint, leached, surface expression is 5 ft thick and has only trace amounts of silver. Subsurface exploration below a depth of about 180 ft disclosed a vein averaging about 22 ft thick and containing 6 to 7 oz/ton silver and about 0.04 oz/ton gold (Young, 1984, p. 5 and 6).

Summary descriptions of the 13 mineral sites examined in the Silver Peak Range North Wilderness Study Area are listed in table 1.



## OTHER MINERAL OCCURRENCES

The only potentially economic, nonmetallic mineral commodity in the study area is marble. Marble interbeds are included in the Paleozoic-age rocks that crop out on the west side of Icehouse Canyon. The marble beds examined are as thick as 10 ft and as long as 2 mi. Three chip samples taken at 2 places (nos. 2 and 5) contained 46.7 to 54.5 percent calcium, 0.55 to 2.8 percent magnesium, 0.28 to 1.6 percent iron, 0.54 to 1.2 percent aluminium, and less than 1 percent silica. The analyses indicate that the marble is good quality and could be used to make lime or cement. However, the beds are too far from markets to be classified mineral resources. There is abundant alluvium (sand and gravel) along Icehouse Canyon. However, this material is unsorted and contains a high percentage of clay and soft minerals. It would be suitable for use as fill but not as a source of sand and gravel. Because of this and the distance to potential markets it cannot be classified a mineral resource.

Known geothermal and borate (principally ulexite) resource areas, and oil and gas lease areas, are located to the west of the study area in Fish Lake Valley. Fish Lake Valley is a down-faulted block separated from the study area by a fault zone. There is no evidence that the geothermal, borate, or oil and gas source rocks cross the fault zone into the study area, nor is there evidence of other energy resources in the study area.

## APPRAISAL OF MINERAL RESOURCES

No resources were identified in the study area. Identified along the two zones that cross the study area were 13 prospects containing over 40 epithermal veins. Additional undiscovered mineralized areas may occur. The vein exposures examined are leached, as thick as 21 ft and as long as 1,000 ft. Metal concentrations in the samples from across the veins are too low and erratic to warrant a calculation of tonnages. However, the concentrations detected, plus rock alteration, mineral assemblages, and similarity to veins in the Dyer and Silver Peak mining districts, suggest that silver and gold resources may be present at depth. The small amounts of copper, lead, and zinc also contained in the veins do not at present constitute a resource. They could not be recovered using cyanide leaching process, the most economic process for recovery of precious metals. Subsurface exploration had to be done to prove a minable deposit in the Sixteen-to-One vein, and similar work would be necessary at the veins in the study area. The Sunshine Springs prospect (no. 2), Elizabeth prospect (no. 3), Extra Gold prospect (no. 5), Prospect No. 7, Jeff Davis prospect (no. 9), and Copper Quartz prospect (no. 11) in particular should be investigated further.



## RECOMMENDATIONS FOR FURTHER WORK

The two mineralized zones containing 13 prospects investigated during this study are very extensive. Data obtained suggests that resources may be present, but additional work will be needed to identify those resources. The additional work that is needed includes mapping and sampling followed by trenching or drilling. If resources are identified, then detailed economic, engineering, and financial analyses should be done.

TABLE 1.--Summary descriptions of mines and prospects in and adjacent to the Silver Peak Range North Wilderness Study Area

[Study area sites underlined may have resources at depth; an asterisk (\*) signifies a location outside the wilderness study area; ppm = part per million; oz/ton = troy ounce per ton; principal commodities are shown in parenthesis, gold (Au), silver (Ag), copper (Cu), lead (Pb), and zinc (Zn); Bureau of Mines samples averaged 0.12 ppm silver, 30 ppm copper, 40 ppm lead, 110 ppm zinc, and 70 ppm arsenic]

Map no. (pl. 1)	Name	Summary	Workings and production	Sample and resource data
1	Prospect No. 1 (Ag)	A 2- to 4-ft-thick zone of epithermal, calcite-quartz stringers trends east and dips 90° in kaolinized tuff. The zone is leached, limonite stained, and is exposed for about 100 ft along strike.	None.	Two chip samples were taken. One across the east end of the zone assayed 0.051 ppm silver, 16.1 ppm lead, and 16.5 ppm arsenic. A sample across the west end contained 0.073 ppm silver, 31.1 ppm copper, 84.5 ppm lead, and 42.1 ppm arsenic.
2	<u>Sunshine Springs prospect</u>	A 1.3-mi-wide zone of epithermal, quartz-calcite fissure veins in fractured, propylitically altered, interbedded, volcanic, and metasedimentary rocks is transected by Icehouse Canyon. The veins examined are 0.3 to 4.0 ft thick, strike N. 10° to 70° E., and dip 70° NW. to 80° SE. They are leached, limonitic, and contain pyrite, acanthite, galena, and malachite.	Raw prospect; claim monuments only.	Fifteen chip samples were taken by USBM personnel. The data for another 16 chip samples were supplied by the Sunshine Mining Company. The 30 samples across veins and fractures had as much as 1.52 ppm gold, 167.6 ppm silver, 100 ppm copper, 2,800 ppm lead, 220 ppm zinc, 190 ppm arsenic, and 71 ppm tungsten. Three samples contained 0.103 to 1.52 ppm gold and two 64 to 71 ppm tungsten; 8 had more than 0.12 ppm silver; 11 over 30 ppm copper; 18 more than 40 ppm lead; 8 more than 110 ppm zinc, and 5 over 70 ppm arsenic. A chip sample of country rock contained 0.005 ppm silver, 4.1 ppm copper, 14.9 ppm lead, 64.3 ppm zinc, and 4.5 ppm arsenic. None of the 16 veins examined is high enough grade to be classified a resource. However, the high concentrations of metals in the samples warrant additional sampling and mapping.



TABLE 1.--Summary descriptions of mines and prospects in and adjacent to the Silver Peak Range North Wilderness Study Area--Continued

Map no. (pl. 1)	Name	Summary	Workings and production	Sample and resource data
3	<u>Elizabeth prospect</u> (Au)	Gold-bearing, epithermal calcite, and jasperoid veins are along a N. 40° to 50° E. striking, 65° to 85° SW. dipping zone that transects altered limestone, calcareous siltstone, shale, and volcanic rocks. The zone is at least 100 ft thick and can be traced for 3,300 ft. It dips under talus into the study area.	Numerous pits and caved underground workings, and about 1 mi of drill roads; none within the study area.	Intermountain Resources, Incorporated, took 65 rock chip samples. Of the 65 samples, 12 had more than 0.01 oz/ton gold, with 0.26 oz/ton being the highest gold value detected. Drilling (outside the study area) to outline a minable deposit was in progress in 1986.
4	DR mine (Ag, Au)*	To the west of the study area, and along a zone in altered, calcareous sedimentary beds, granitic rocks, and volcanic rocks, are epithermal quartz-calcite-jasperoid veins. The veins examined are 0.7 ft to 2.1 ft thick, trend east, dip steeply, and contain limonite, malachite, pyrite, and acanthite.	For about 3 mi along the zone are many small underground workings, prospect pits, and cuts. Production is indicated, but none is recorded.	Six of 18 samples taken by the claimants had 1.92 to 66.8 oz/ton silver; four contained more than 20 oz/ton. Also detected were minor amounts of gold and copper. A 2.1-ft-long chip sample taken across the vein outcrop nearest the study area by USBM personnel had 0.07 oz/ton gold and 6.4 oz/ton silver. A grab sample from a nearby stockpile assayed 0.05 oz/ton gold, 24.1 oz/ton silver, 450 ppm copper, 0.73% lead, 480 ppm zinc, 560 ppm antimony, and 0.54% arsenic. The zone that contains the veins trends east under latite into the study area.

TABLE 1.--Summary descriptions of mines and prospects in and adjacent to the Silver Peak Range North Wilderness Study Area--Continued

Map no. (pl. 1)	Name	Summary	Workings and production	Sample and resource data
5	Extra Gold prospect (Ag, Au)	Epithermal veins are poorly exposed over a 1- by 2-mi area of northwest-trending, gently southwest dipping, altered, calcareous sedimentary beds and volcanic rocks. The calcareous sedimentary beds consist of marble and hornfels, and the volcanic rocks consist of andesitic flows, pyroclastics, and sediments. All contain veins and are limonite stained, silicified, and propylitically altered. The veins examined are 0.6 to 21 ft thick, trend northeast, dip steeply, and are mainly quartz and calcite with minor amounts of limonite.	A raw prospect with claim notices and a cabin.	Thirty-three samples were taken by USBM personnel. The data for another sample were supplied by the Sunshine Mining Company. Of the 19 chip samples across veins, two assayed 0.69 and 0.137 ppm gold; one had 6.17 ppm silver, five had over 0.12 ppm silver; four contained more than 30 ppm copper; four over 40 ppm lead; two more than 110 ppm zinc; four more than 70 ppm arsenic; and three had 37 to 71 ppm tungsten. The eight grab samples of quartz assayed as much as 0.02 oz/ton silver, 120 ppm copper, 16 ppm lead, 64 ppm zinc, and 310 ppm arsenic. Three of the grab samples contained more than 0.12 ppm silver, two over 30 ppm copper, one more than 40 ppm lead, and 70 ppm arsenic. The seven chip samples of country rock averaged 0.07 ppm silver, 18 ppm copper, 7 ppm lead, 48 ppm zinc, and 8 ppm arsenic. The 19 veins identified are too low grade to be classified resources.
6	Mud Springs prospect (Ag)*	Outside the east study area boundary is an east-trending, 80° to 90° N. dipping zone of altered, limonitic rhyolite that is overlain by nearly horizontal latite. The zone is 400 to 800 ft wide and crops out for about 1.5 mi. Rocks along the zone are sheared, propylitically and argillically altered, silicified, and limonitic, and contain epithermal quartz veins and manganese oxide.	About 600 ft of bulldozer trenching and drill site preparation has been done.	Two samples were taken by USBM personnel. A 3-ft chip sample across a shear zone had 0.7 ppm silver and 0.2% zinc. A grab sample of quartz breccia assayed 0.1 oz/ton silver, 49 ppm copper, 580 ppm lead, and 390 ppm zinc. Twenty-five soil samples were taken and analyzed by the Sunshine Mining Company. These are reported to have contained anomalous amounts of antimony, mercury, thallium, and arsenic.



TABLE 1.--Summary descriptions of mines and prospects in and adjacent to the Silver Peak Range North Wilderness Study Area--Continued

Map no. (pl. 1)	Name	Summary	Workings and production	Sample and resource data
7	<u>Prospect No. 7</u> (Ag)	An epithermal vein of leached, limonitic, quartz breccia strikes N. 70° to 85° E. and dips 85° NW. to 85° SE. in beds of kaolinized, rhyolitic volcanics. The beds trend north, dip 10° to 20° W., and contain a 2-ft thick rhyolite dike that strikes N. 50° E. and dips 90°. The 1.8- to 4.0-ft-thick vein can be traced for about 1,000 ft.	Two prospect pits and a 10-ft adit.	Five chip samples were taken. Three were taken across the vein, one from each of the workings. A 1.8-ft sample across the vein exposure in the adit assayed 2.1 oz/ton silver. The second vein chip sample had 0.1 ppm silver, 33 ppm copper, 43 ppm zinc, and 200 ppm arsenic. The third contained 0.1 ppm silver. A sample of wallrock contained 0.169 ppm silver, 25 ppm copper, 29.4 ppm lead, 54.9 ppm zinc, and 1.59 ppm arsenic. A sample across the dike had 0.108 ppm silver and 11 ppm arsenic.
8	<u>Prospect No. 8</u> (Ag)	A 3.0-ft-thick, 25-ft-long exposure of a limonitic, epithermal quartz strikes N. 50° W. and dips 45° NE. in kaolinized andesite.	A 10-ft adit.	A chip sample across the quartz contained 2.7 ppm silver, 22 ppm copper, 280 ppm lead, 120 ppm zinc, and 700 ppm arsenic.
9	<u>Jeff Davis prospect</u> (Au, Ag)	An east-trending zone of interbedded volcanic rocks that is leached, silicified, kaolinized, limonitic, and calcite enriched is exposed in a canyon bottom. The zone is exposed over an area that measures 800 ft by 600 ft and is covered by latite beyond the canyon. The beds along the zone strike N. 20° to 30° E., dip 35° to 85° NW., and are transected by shear zones that are 3 to 4 ft thick.	Two adits that total 25 ft.	Five chip samples were taken. Two across the shear zone followed by the adits, and two of wallrock. One shear zone sample had 0.058 ppm gold; the other contained 0.566 ppm mercury. They also had 0.135 and 0.254 ppm silver. One wallrock sample assayed 0.054 ppm gold; the two had 0.039 and 0.005 ppm silver. A sample of tuff had no significant metal concentration.

TABLE 1.--Summary descriptions of mines and prospects in and adjacent to the Silver Peak Range North Wilderness Study Area--Continued

Map no. (pl. 1)	Name	Summary	Workings and production	Sample and resource data
10	Wildhorse mine (Ag, Pb, Zn)	A zone of leached, epithermal, quartz, calcite, and jasperoid veins trends northeast across intensely folded, fractured, limonite-stained, kaolinized, calcareous, metasedimentary beds that trend northeast and dip southeast; and volcanic rocks that are nearly horizontal. The zone is at least 300 ft wide and can be traced for about 1 mi along trend. The vein exposures examined along the zone are leached, as thick as 5.0 ft, as long as 1,000 ft, strike N. 35° E. to S. 40° E., dip over 30°, and contain pyrite, sphalerite, galena, and limonite boxwork.	Eight prospect pits and three underground workings that total about 60 ft. About 100 tons of ore production is indicated; none is recorded.	A total of nine samples were taken. A grab sample of vein material from a stockpile had 0.13 ppm silver, 164 ppm lead, 0.88% zinc, and 17.2 ppm arsenic. A 2.9-ft chip sample across the vein exposure in the underground workings near the stockpile contained 3.33 ppm silver, 0.12% lead, 1.05% zinc, and 99.6 ppm arsenic. Both samples were of material that probably came from underground. Six chip samples were taken across surface vein exposures located northeast of the underground workings. Of the six, two had over 0.12 ppm silver; three contained over 40 ppm lead; three had over 110 ppm zinc; and two contained more than 70 ppm arsenic. A sample of country rock assayed 0.193 ppm silver, 12.8 ppm lead, 10.1 ppm zinc, and 14.3 ppm arsenic. None of the five veins examined is well enough exposed or high enough grade to warrant an estimate of resources.
11	<u>Copper Quartz prospect</u> (Cu, Au, Ag)	A leached, epithermal vein containing quartz, limonite, and malachite is in calcareous metasedimentary beds that strike N. 30° E. and dip 50° SE. The beds are overlain by volcanic rocks. The vein strikes N. 45° W., dips 62° NE., averages 2.2 ft thick, and can be traced for about 200 ft.	One 15-ft adit and two prospect pits.	Four chip samples were taken; three chips across the vein and a grab of quartz from the dump. A chip sample across the south end had 0.49 oz/ton gold, 0.35 oz/ton silver, and 1.65% copper. All of the chip samples averaged 0.16 oz/ton silver and 1% copper. The grab sample assayed 0.1 oz/ton silver and 1.1% copper. The leached vein exposure is too erratically mineralized to be classified a resource.



TABLE 1.--Summary descriptions of mines and prospects in and adjacent to the Silver Peak Range North Wilderness Study Area--Continued

Map no. (pl. 1)	Name	Summary	Workings and production	Sample and resource data
12	American Gold mine (Ag, Pb, Zn)	A poorly exposed epithermal vein is along marble beds that strike N. 30° E. and dip 25° SE. The marble is overlain by altered hornfels and volcanic beds. The vein is as thick as 3 ft, as long as 500 ft, and is mainly quartz with galena, sphalerite, limonite, and malachite.	One 50-ft shaft, seven adits totaling 200 ft, and at least 10 prospect pits. Production is indicated by the workings. However, none is recorded.	Two samples were taken. A 3.0-ft chip sample across the only vein exposure assayed 0.6 oz/ton silver, 120 ppm copper, 2.6% lead, and 360 ppm zinc. A grab sample of quartz with limonite and hematite from a 10-ton stockpile had 0.03 ppm gold, 1.0 oz/ton silver, 560 ppm copper, 29.3% lead, and 4.1% zinc.
13	Valley View prospect (Cu, Au, Ag)	Epithermal veins 2.3 to 3.6 ft thick and composed of quartz, calcite, jasperoid, limonite, hematite, and malachite strike N. 50° to 80° W. and dip 30° to 90° NE. in nearly horizontal, kaolinized, volcanic rocks near marble beds.	Three adits totaling 450 ft and seven small pits are scattered for 2.5 mi along the east-trending zone that contains the veins.	Six samples were taken. Five chip samples across leached vein exposures and wallrock had as much as 0.85 ppm gold, 1.9 ppm silver, 0.97% copper, 38 ppm lead, 460 ppm zinc, and 560 ppm arsenic. A grab sample of stockpiled quartz contained trace gold, 0.85% copper, and 110 ppm zinc.

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PLATE 1 - Mines and prospects in and adjacent to the Silver Peak Range North Wilderness Study Area, Esmeralda County, NV