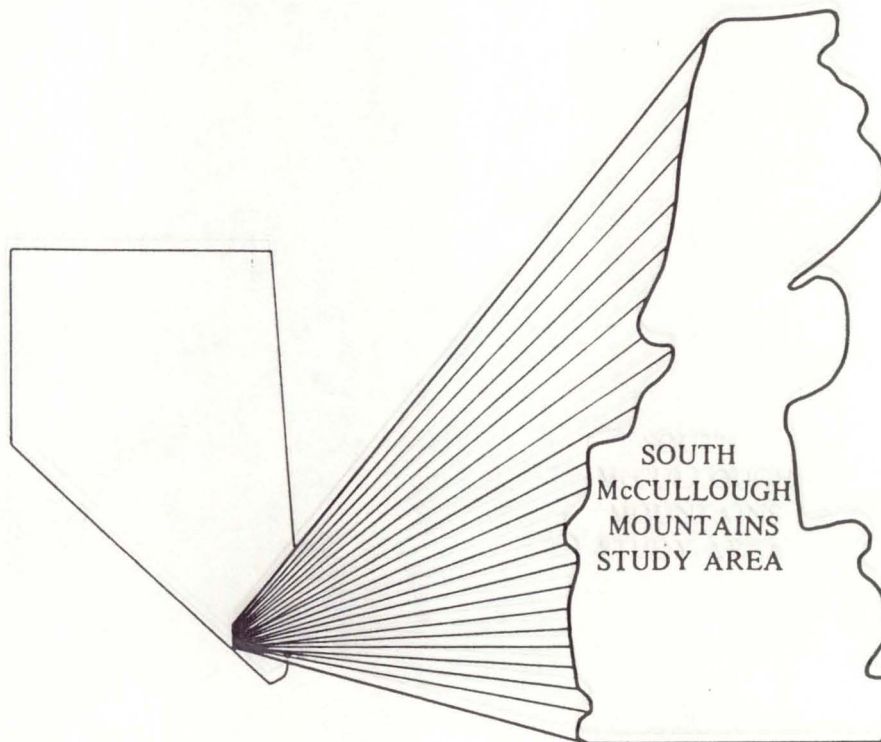


MLA 11-87

Mineral Land Assessment/1987
Open File Report

Mineral Resources of the South McCullough Mountains Study Area, Clark County, Nevada



BUREAU OF MINES
UNITED STATES DEPARTMENT OF THE INTERIOR

MINERAL RESOURCES OF THE SOUTH McCULLOUGH MOUNTAINS
STUDY AREA, CLARK 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 lands 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 Bureau of Mines mineral survey of a portion of the South McCullough Mountains Wilderness Study Area (NV-050-435), Clark 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 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

In 1985, at the request of the U.S. Bureau of Land Management, the U. S. Bureau of Mines studied part of the 56,623-acre South McCullough Mountains Wilderness Study Area (NV-050-435) in order to evaluate its identified mineral resources. The area studied is located in Clark County, NV, about 30 miles southwest of Boulder City. No mineral resources were identified.

The study area contains the eastern part of the unorganized McCullough Mountain (McClanahan) mining district which has had no recorded production. Between 1911 and 1982, 23 lode claims were located in the part of the mining district that is in the study area; four of these claims are currently held by assessment (1986). A total of 11 mineral sites were found and examined during the U.S. Bureau of Mines investigations; 26 mine workings were examined. Of the 11 sites, four are within the study area, and seven are nearby. Of the seven nearby sites, six are adjacent to the west boundary and consist of precious- and base-metals bearing vein occurrences in metamorphic rocks. The seventh site is near the east study area boundary, and consists of a tungsten-bearing vein occurrence that is also in metamorphic rocks. The four sites within the study area consist of vein occurrences in metamorphic rocks that contain silver, gold, arsenic, lead, zinc, and copper. The veins at these four sites are too small and low grade to be classified resources; however, there are indications that three of the sites may have silver and gold resources at depth. Detailed delineation of the veins, and determinations of tonnages and grades are needed. This would entail additional mapping and sampling, trenching and drilling, and opening inaccessible workings.

Large deposits of poor quality sand, gravel, and stone also occur within the area studied; however, developed deposits of higher quality construction materials are located closer to markets. No energy minerals or geothermal resources were identified in the study area.

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 mineral resource potential of the South McCullough Mountains 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 area studied 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 an adequate and dependable supply of minerals at

a reasonable price. All data are on file at the USBM Western Field Operations Center, Spokane, WA. Combined results of the USBM and USGS work will be summarized in a joint report and map published by the USGS.

Setting

The South McCullough Mountains Wilderness Study Area (NV-050-435) totals 56,623 acres. In 1984, a 19,588-acre part was requested for mineral study by the BLM. The term "study area" used in this report refers to the 19,588-acre part studied by the USBM.

The study area is located in the southern part of the north-trending McCullough Range, between the Highland and Lucy Grey Ranges, about 30 mi (miles) southwest of Boulder City, in Clark County, NV (figs. 1 and 2, table 1). The east and west boundaries of the study area can be reached by roads branching from transmission line roads. These roads depart U.S. Highway 95 about 16 mi southwest of Boulder City, NV. A few unmaintained foot trails are within the study area.

The study area is part of an uplifted, fault-bounded block in the Basin and Range physiographic province (Fenneman, 1931). The 10-mi-long, 2- to 4-mi-wide area with its gently rolling mountains and steep sided east- and west-trending canyons has been uplifted and tilted east relative to the surrounding valleys. Elevations range from 2,800 ft (feet) near McCullough Pass to 7,026 ft at the summit of McCullough Mountain.

There are no permanent streams and only a few small springs around the edges of the study area. Most precipitation falls as rain between December and May. Cactus, sagebrush, sparse grass, and other desert-type plants predominate at lower elevations where precipitation is low and temperatures are high. Limber pine, juniper, and pinyon pine grow at higher elevations.

Previous Studies

Previous geology and minerals studies conducted in the vicinity of the study area concentrated on the Crescent and Sunset mining districts. The geology of the study area is outlined in a general way in the literature. No mineral deposits in the study area are described. In 1965, Longwell and others (p. 94-96, plate 1) briefly described the McCullough Range and published a geologic map at a scale of 1:250,000. In 1973, Bingler and Bonham published a generalized geologic map of the entire McCullough Range. Great Basin GEM Joint Venture (1983) prepared a preliminary GEM (geology, energy, and minerals) report for an area which included the study area.

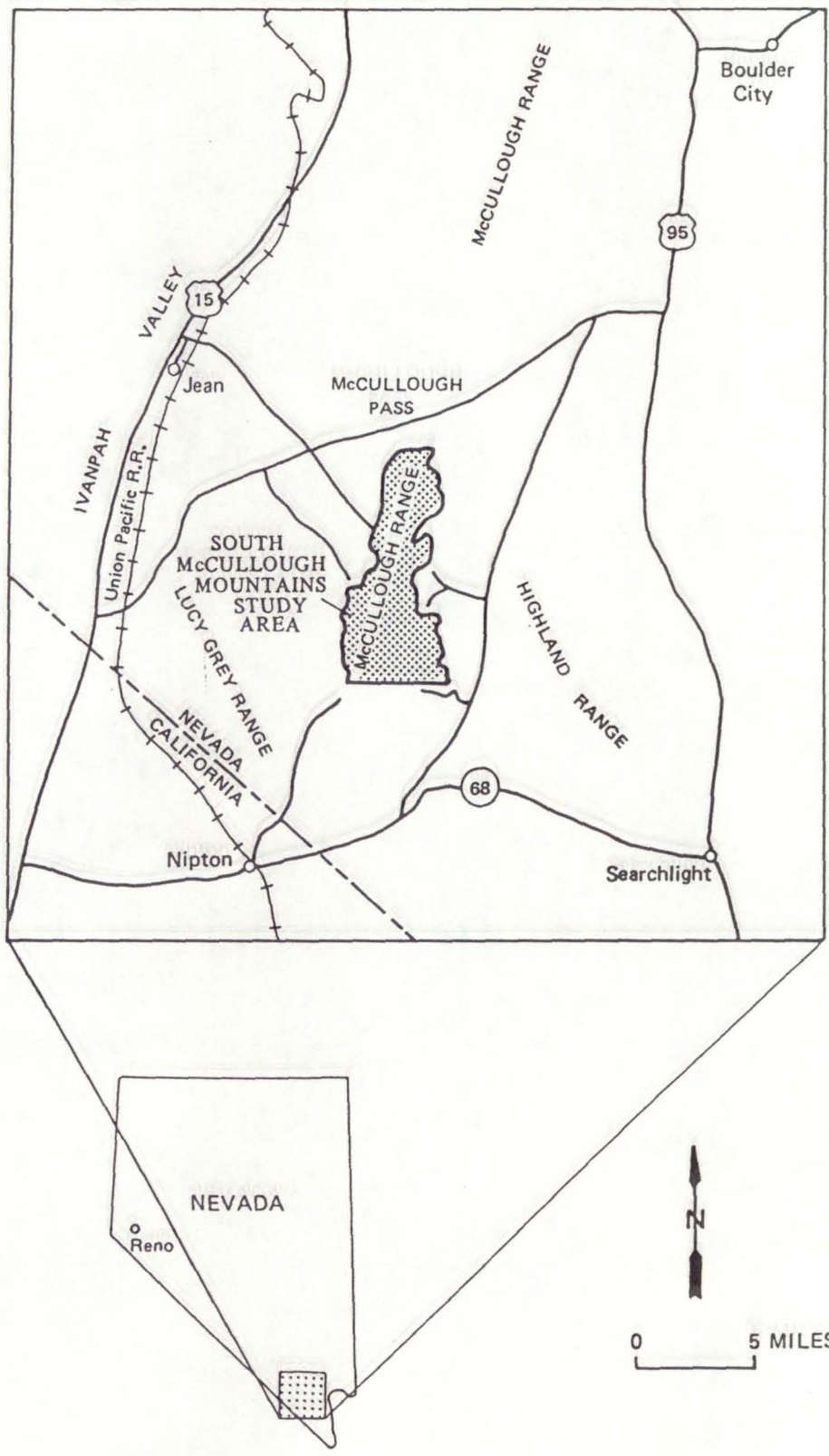


FIGURE 1.—Location of the South McCullough Mountains study area, Clark County, NV

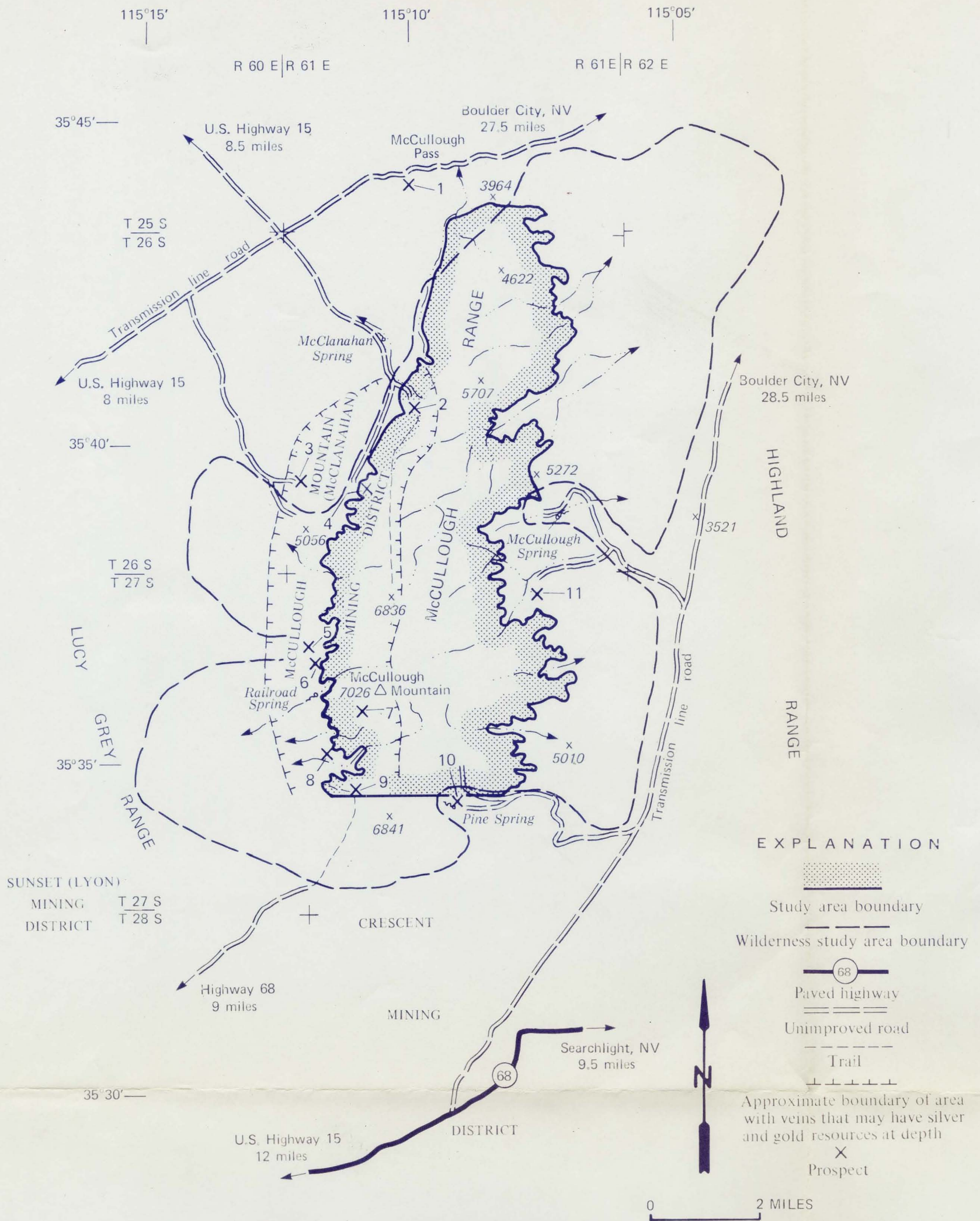


FIGURE 2.—Mineral sites within and adjacent to the South McCullough Mountains study area, Clark County, NV

Table 1.--Mineral sites within and adjacent to the
South McCullough Mountains study area

[Study area sites underlined may have resources at depth; an
* (asterisk) signifies a site outside the study area;
principal metals are shown in parentheses, As (arsenic),
Cu (copper), Au (gold), Pb (lead), Ag (silver), W (tungsten),
and Zn (zinc)]

(Map no.)	Name
1.	McCullough Pass prospect*
2.	<u>Hacienda prospect (Ag, Au)</u>
3.	<u>Dry Springs prospect (As)*</u>
4.	<u>Breyfogle prospect (Ag, Pb, Zn, As)</u>
5.	Prospect No. 5 (As)*
6.	Prospect No. 6 (Cu, As)*
7.	Prospect No. 7
8.	Prospect No. 8 (As)*
9.	<u>Silver King prospect (Au, Cu, As)</u>
10.	Apprentice prospect*
11.	War Lord prospect (W)*

Present Study

Work by the USBM Western Field Operations Center, Spokane, WA, entailed prefield, field, and report writing phases conducted during 1985 and 1986. Prior to the field work, claim and mining data were obtained from records of Lincoln and Clark Counties and the BLM, from publications, and from claim owners. Federal publications, Nevada State publications, and USBM statistical files were searched for production records; none were found. Claim owners were contacted for permission to examine properties and publish the results.

The April 1985 field studies involved a search for all reported mineral sites; 11 were found and sampled. Four of the 11 sites are in the study area, and 7 are within 1 mi. The seven nearby sites were examined to determine if their mineralized zones extend into the study area; they do not. One site located in the study area was mapped with alidade and plane table, and two were mapped with compass and measuring tape. At the 11 sites, USBM personnel collected 44 rock samples. Data from another 11 samples were supplied by a claim owner. The samples taken by the USBM 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 float (loose rock lying on the ground).

The samples were crushed, split, and checked for radioactivity and fluorescent minerals at the Western Field Operations Center and sent to the USBM Reno Research Center, NV, for analyses. At least one sample from each mineralized structure was analyzed by semiquantitative spectrography to determine the concentrations of 40 elements ^{1/}. The gold and silver content of the samples was determined by fire assay or fire assay combined with inductively coupled plasma analysis. The gold detection limit was 0.005 oz/ton (troy ounce per ton), and the silver detection limit was 0.1 oz/ton. The amounts of base metals were determined by atomic absorption or inductively coupled plasma analysis. The detection limit for arsenic was 30 ppm (part per million), for copper it was 6 ppm, and for lead and zinc it was 10 ppm.

ACKNOWLEDGEMENTS

The author thanks claimant L. C. Artman for the minerals data that he provided. USBM Geologists David Lipton and Vaughn Girol aided in the gathering of data for this report.

^{1/} 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, potassium, platinum, scandium, silicon, silver, sodium, strontium, tantalum, tellurium, tin, titanium, vanadium, yttrium, zinc, and zirconium.

GEOLOGIC SETTING

The South McCullough Mountains study area is a complex, uplifted, east-tilted, fault-bounded, block of gneiss that is intruded by quartz monzonite stocks and quartz-microcline pegmatite dikes. All are Precambrian-age. These rocks are exposed in the southern two-thirds of the study area, but are overlain by a sequence of Tertiary-age volcanic and volcanoclastic rocks in the northern one-third. The metamorphic rocks along the west side of the study area are transected by a normal, north-trending, west-dipping fault (Longwell and others, 1965, p. 95). Most of the mineralized structures examined are associated with this fault and consist of brecciated quartz veins. The veins examined are 0.3 to 15.0 ft thick, slightly limonite- and malachite-stained, and like many veins in Nevada, leached at the surface. Silver and gold are the principal metallic elements. Lead, zinc, copper, and arsenic are locally present. The exception is the War Lord prospect (fig. 2, no. 11) located 0.5 mi east of the study area. This prospect consists of a scheelite-bearing vein in metamorphic rocks.

MINES AND PROSPECTS

Mining history

Lincoln and Clark county claim records list the unorganized McCullough Mountain (McClanahan) mining district as being located along the western edge of the study area. There is no record of production for this district. To the south are the Crescent (turquoise, gold, silver, copper, and lead) and the Sunset (Lyon) (gold, silver, copper, and lead) mining districts. There is no indication that deposits in these southern districts extend into the study area.

Mining Claims

The first mining claims were recorded in the study area (in the McCullough Mountain mining district) in 1911. Another 20 lode claims were located between the 1920's and 1980's. Four claims staked in 1982 are currently (1986) held by assessment. In addition, a large number of claims 1 to 2 mi south and east of the study area are currently held. There are no mineral leases or patented mining claims in the study area. The nearest patented mining claims are about 2 mi south in the Crescent mining district.

Significant Mineral Sites

Following in alphabetical order are descriptions of the three significant mineral sites examined in the South McCullough Mountains study area. They are significant because they have evidence of resources.

Breyfogle prospect
(0320030699) 2/

The Breyfogle prospect (fig. 2, no. 4) is on the west side of the study area about 3.5 mi north of the summit of McCullough Mountain. The prospect can be reached by traveling southwest about 39 mi by road from Boulder City then east 1 mi cross-country on foot. The three Breyfogle lode claims were located in 1940.

Two poorly exposed veins are along shear zones in biotite gneiss intruded by quartz monzonite (fig. 3). The principal vein averages 1.5 ft thick, dips 80° SE., and can be traced for 50 ft along its N. 60° to 70° E. strike. Workings on the vein include a flooded shaft that is estimated to be about 100 ft deep and two prospect pits.

The second vein, exposed only in a prospect pit, is approximately 180 ft to the north. This vein is 2 ft thick, strikes N. 50° E., and dips vertically. Both veins are leached and composed mainly of quartz with accessory calcite, limonite, specular hematite, arsenopyrite, and galena. The surrounding gneiss is limonitic and silicified.

The locations of the six samples taken are shown on figure 3. Analyses are listed on table 2.

The two chip samples across the surface exposure of the principal vein (fig. 3, nos. 4 and 5) averaged 0.27 oz/ton silver, 0.07 percent lead, 0.049 percent zinc, and 0.013 percent arsenic. One chip sample across the second vein (fig. 3, no. 1) had 1.9 oz/ton silver, 0.19 percent lead, 0.18 percent zinc, and 0.011 percent arsenic. The vein exposures are too small and low grade to be classified resources (USBM and USGS, 1980, p. 1-5). However, the chip samples represent leached material. The grab sample from the stockpile at the shaft (fig. 3, no. 3), contained 3.1 oz/ton silver, 1.0 percent lead, and 0.7 percent zinc, and may be more indicative of material at depth. The water in the shaft needs to be pumped out and the vein exposure in it sampled to determine if resources exist at depth.

Hacienda prospect
(0320030701)

The Hacienda prospect (fig. 2, no. 2) is owned by L. C. Artman, R. E. Ditto, and L. W. Colman of Henderson, NV. The prospect is 1.5 mi southeast of McClanahan Spring and can be reached by traveling southwest 39 mi by dirt road from Boulder City. Four claims were located at the site in 1911. The four Hacienda lode claims were recorded in 1982 and are held by assessment (1986).

2/ USBM Minerals Industry Location System Number.

Table 2.--Analyses of samples from the Breyfogle

(N, none detected; NA, not applicable)

No.	Type	Sample		Silver (oz/ ton)	Lead (pct)	Zinc (pct)	Arsenic (pct)
		Length (ft)	Description				
1	Chip	2.0	Across second vein	1.9	0.19	0.18	0.011
2	Grab	NA	Quartz and wallrock dump material	N	.0097	.023	.02
3	do..	NA	Quartz from 10-ton stockpile	3.1	1.0	.7	.012
4	Chip	2.0	Across principal vein	.2	.063	.049	.015
5	do..	1.0	do.....	.4	.07	.049	.011
6	Grab	NA	Dump material	N	.003	.0099	.016

A 0.8- to 15-ft-thick fissure vein, traceable for 670 ft, strikes N. 70° to 80° W. and dips 85° to 90° SW. in limonitic, silicified biotite gneiss that is intruded by quartz monzonite and pegmatite dikes (fig. 4). Vein exposures average 5.9 ft thick, are leached, and are mainly quartz with sparse limonite, manganese oxide, and malachite. Boxwork on dumps indicate that sulfides may occur 20 to 30 ft underground. Workings along the vein include an inaccessible adit that is estimated to be about 80 ft long, three bulldozer trenches that total about 90 ft, and four prospect pits.

USBM personnel took 16 samples; the claimant supplied the data for 11 samples he had taken. The locations of all the samples are shown on figure 4. Analyses are listed on table 3. The principal metals contained in the samples were gold and silver. However as much as 0.001 percent copper, 0.0013 percent lead, 0.007 percent zinc, and 0.021 percent arsenic were also detected.

All USBM samples were collected from leached outcrops, and do not indicate mineral resources. However, the malachite and the sample data supplied by the claimant, suggest that silver-, gold-, copper-, and arsenic-bearing material may occur below the leached zone. An examination of the vein exposure in the inaccessible adit would give a better indication of possible resources at depth.

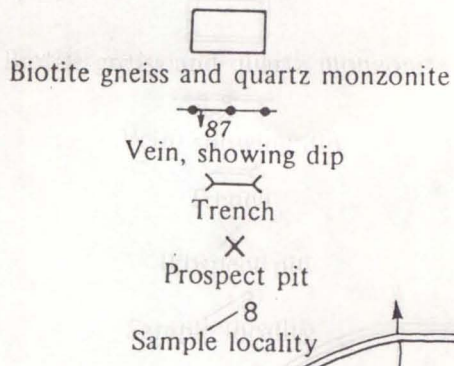
Silver King prospect (0320030707)

The Silver King prospect (fig. 2, no. 9) is about 2 mi south of the summit of McCullough Mountain. The workings can be reached by traveling southwest 44 mi by road from Boulder City then northeast approximately 2 mi cross-country on foot. The seven Silver King lode claims were located between 1912 and 1921. A few tons of ore production is indicated by the workings; however, none is recorded.

A principal vein and two smaller veins crop out over an area that measures 1,000 by 2,000 ft (fig. 5). The veins are 0.3 to 7.0 ft thick and are along N. 40° E. to S. 42° E. trending, steeply-dipping shear zones in silicified, limonitic, biotite gneiss. The principal vein averages 2.7 ft thick and is exposed for 1,000 ft (fig. 5, nos. 1-5). Surface vein exposures are leached and brecciated, and composed of quartz, calcite, and sparse limonite and malachite. Boxwork on the dumps indicates that sulfides may be present a few feet underground. Workings on the principal vein consist of a 15-ft adit and two prospect pits. Two additional prospect pits are on smaller veins.

The locations of the seven samples taken are shown on figure 5. Analyses are listed on table 4. Gold and copper were the principal metals detected in the samples. However, as much as 0.039 percent lead, 0.031 percent zinc, and 0.019 percent arsenic were also detected.

EXPLANATION



Biotite gneiss and quartz monzonite

Vein, showing dip

Trench

Prospect pit

Sample locality

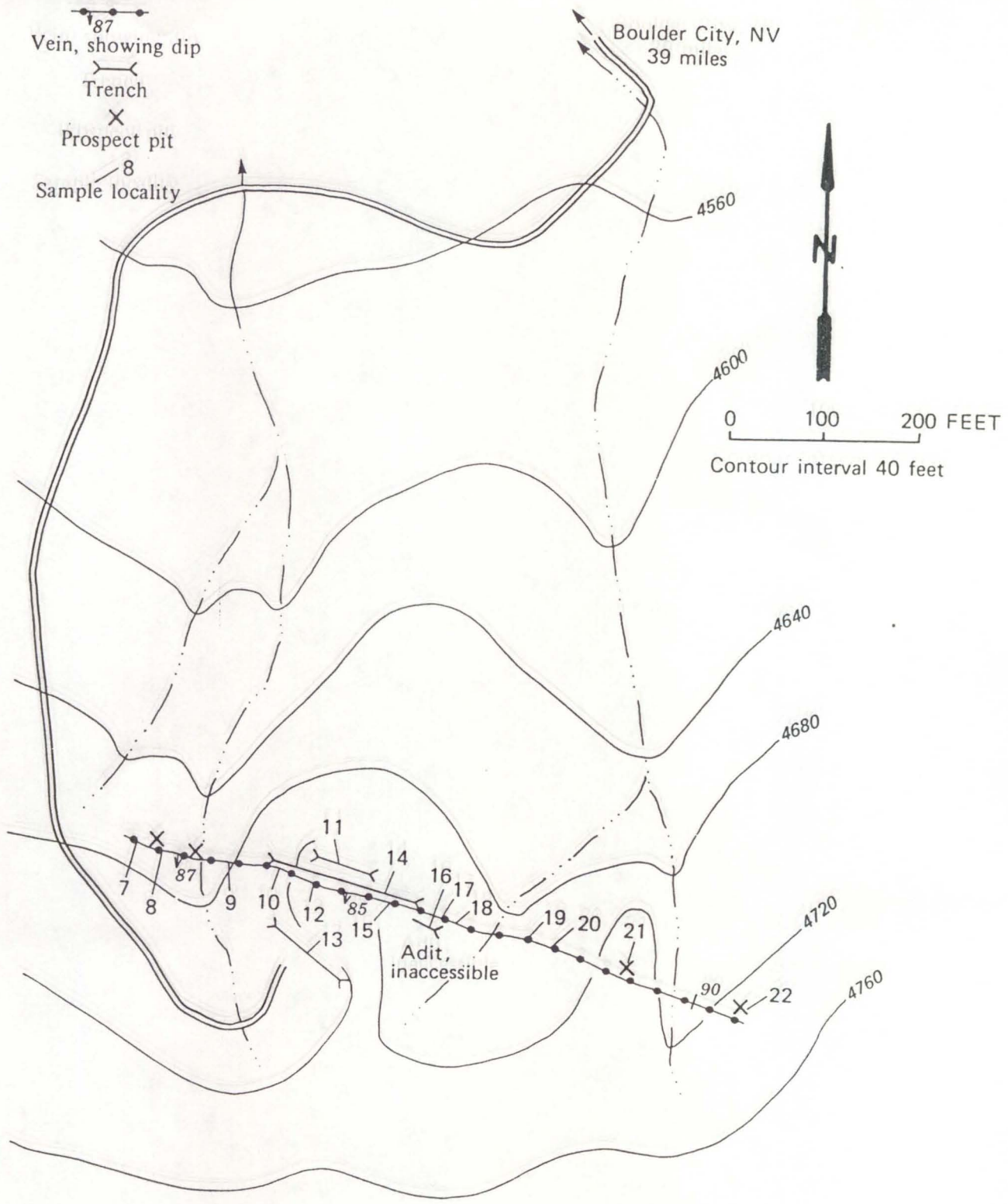


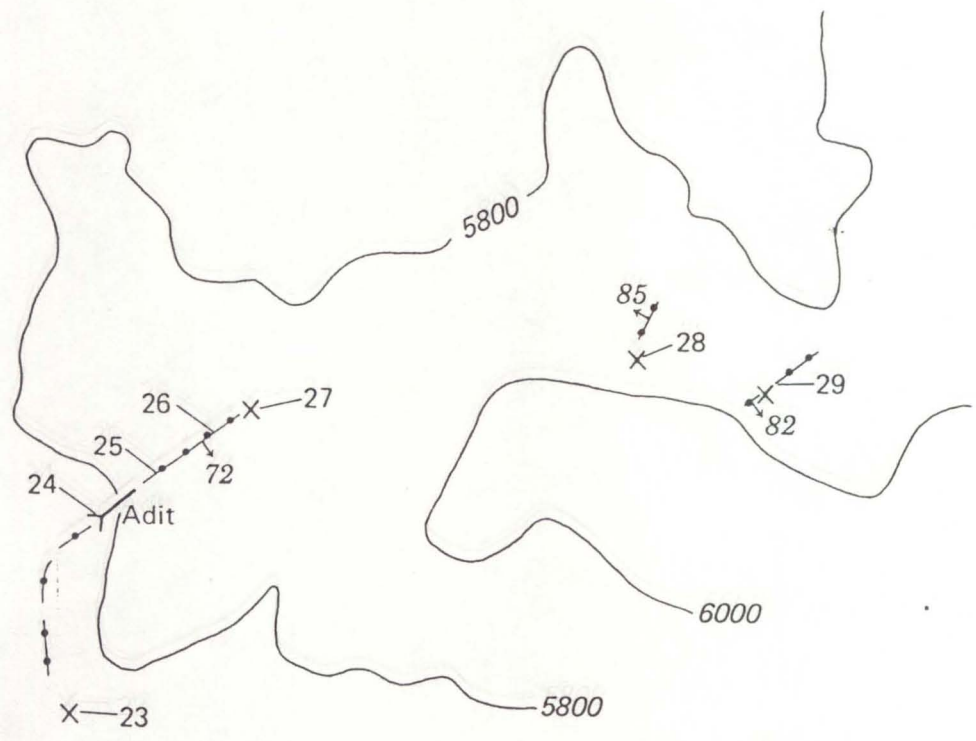
FIGURE 4.— Hacienda prospect

Table 3.--Analyses of samples from the Hacienda prospect


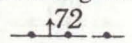


(N, none detected; N/A, not available)

No.	Chip Sample		Gold (oz/ ton)	Silver (oz/ ton)
	Length (ft)	Description		
7	2.4	Across vein	N	N
8	5.0	do.....	N	N
9	8.0	do.....	N	N
10	13.0	do.....	N	N
11	3.4	Across vein footwall	N	N
11 1/	N/A	do.....	0.0003	0.003
12	15.0	Across vein	N	N
12 1/	N/A	do.....	.0002	.003
13	20.0	Across shear zone in the hanging wall	N	N
13 1/	N/A	do.....	.218	10.16
13 T/	N/A	do.....	.304	18.09
13 1/	N/A	do.....	.093	7.16
13 T/	N/A	do.....	.015	.09
13 1/	N/A	do.....	N	.009
14	10.0	Across vein	N	N
15	2.8	do.....	N	N
16	2.5	Across vein at the adit portal	N	N
17	5.4	Across footwall	N	N
18	2.7	Across vein	N	N
18 1/	N/A	do.....	.0006	.006
18 1/	N/A	Across hanging wall	.0003	.009
19	6.0	Across vein	N	N
19 1/	N/A	do.....	.0003	.006
20	3.2	do.....	N	N
20 1/	N/A	do.....	.0006	.006
21	1.4	do.....	N	N
22	0.8	do.....	N	.1

1/ Approximate location of samples taken by the claimant.
The USBM samples were fire assayed and the claimant's
were analyzed by atomic absorption and chemical methods.



EXPLANATION

-  Biotite gneiss
-  Vein, showing dip,
dashed where inferred
-  Prospect pit
-  Sample locality

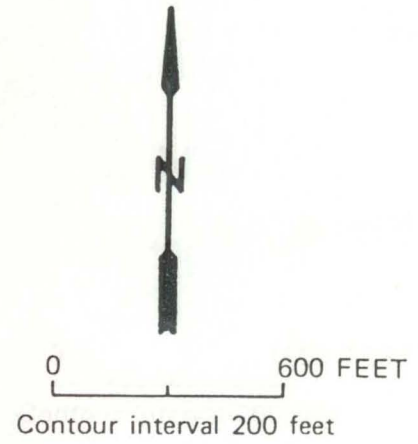


FIGURE 5.— Silver King prospect

Table 4.--Analyses of samples from the Silver King prospect
 (N, not detected)

No.	Chip sample		Gold (troy oz/ ton)	Copper (ppm)
	Length (ft)	Description		
23	0.3	Across principal vein	N	1800
24	4.0	do.....	N	11
25	4.1	do.....	N	77
26	2.3	do.....	N	N
27	7.0	do.....	N	15
28	5.1	Across small vein	0.01	55
29	4.6	do.....	N	39

The leached vein outcrops are too low grade to be classified resources. However, one sample across the principal vein (fig. 5, no. 1) contained anomalous concentrations of copper, and a sample across a secondary vein (fig. 5, no. 6) had anomalous concentrations of gold. Trenching and drilling might disclose resources at depth.

Other Mineral Occurrences

Large quantities of clayey alluvium and incompetent stone occur in the study area. They, however, are not considered resources because higher quality competing sources of the construction materials sand, gravel, and stone are located closer to current markets. There is no evidence of geothermal, oil, and gas resources in the metamorphic rocks that underlie the study area

The 11 mineral sites examined are summarized in table 5.

APPRAISAL OF MINERAL RESOURCES

No mineral resources were identified in the study area; the three significant mineral sites (Breyfogle, Hacienda, and Silver King prospects) in the South McCullough Mountains study area are leached, and too low grade and small to be classified resources. However, persistent veins, rock alteration, boxwork, malachite, or metals-bearing material on dumps at these sites indicate that metal values may increase with depth and that silver and gold resources might be disclosed by additional exploration. Sampling also indicated enough arsenic to impede the metallurgy involved in the metals recovery.

RECOMMENDATIONS FOR FURTHER WORK

Further work is needed at the three significant mineral sites to determine if they have metal-bearing resources at depth. More detailed delineation of the veins including determinations of tonnages and grades at depth are needed. This work would include additional sampling, mapping, opening inaccessible workings, trenching, and drilling. If resources are identified at the sites, then the following should be done: (1) bulk sampling and metallurgical testing; (2) testing rock strengths and mining methods; and (3) cost and market analyses. Bulk sampling and metallurgical testing would include determination of the affect of the arsenic content on recovery. Cost and market analyses would determine the value of the product and rate of return on investment.

TABLE 5.--Summary descriptions of the mineral sites within and adjacent to the South McCullough Mountains study area, Clark County, NV

[Study area sites underlined may have resources at depth; an * (asterisk) signifies a location outside the study area; principal commodities are shown in parentheses, As (arsenic), Cu (copper), Au (gold), Pb (lead), Ag (silver), W (tungsten), and Zn (Zinc)]

Map no. (fig. 2)	Name	Summary	Workings and production	Sample and resource data ^{1/}
1	McCullough Pass prospect*	A pegmatite dike exposed for 140 ft in biotite gneiss averages 13.6 ft thick. The dike strikes N. 50° W., dips 65° NE., is kaolinized, and composed of limonitic quartz and microcline.	One 140-ft trench.	Two chip samples across the dike had no significant mineral concentrations.
2	<u>Hacinda prospect</u> (Ag, Au)	A vein averaging 5.9 ft thick can be traced for 670 ft in limonitic, silicified, biotite gneiss intruded by quartz monzonite and pegmatite dikes. The vein strikes N. 70° to 80° W., dips 85° to 90° SW., is leached, and mainly quartz with sparse limonite and malachite. Boxwork on the dumps indicates sulfides may be at depth.	One inaccessible adit that may be 80 ft long, three bulldozer trenches that total about 90 ft, and four small pits and cuts.	USBM personnel took 16 chip samples. The claimant supplied the data for 11 samples he had taken. The USBM samples contained as much as 10 ppm copper, 210 ppm arsenic, 13 ppm lead, and 70 ppm zinc. Seven of eleven samples taken by the claimant contained as much as 0.0006 oz/ton gold and 0.006 oz/ton silver. The remaining four samples, from a working on the south side of the vein, had 0.015 to 0.304 oz/ton gold and 0.09 to 18.09 oz/ton silver. USBM samples were from leached outcrops and do not indicate mineral resources. However, the malachite and sample data supplied by the claimant suggest that silver-, gold-, and copper-bearing resources may be present below the leached zone.
3	Dry Springs prospect* (As)	A poorly exposed, 4.0-ft-thick quartz vein in biotite gneiss strikes N. 25° W. and dips 55° NE. The vein is brecciated and contains fault gouge.	An area that measures 150 by 60 ft has been bulldozed.	A chip sample across the vein had 7.9 ppm copper, 190 ppm arsenic, and 34 ppm zinc.

TABLE 5.--Summary descriptions of the mineral sites within and adjacent to the South McCullough Mountains study area, Clark County, NV (continued)

Map no. (fig. 2)	Name	Summary	Workings and production	Sample and resource data ^{1/}
4	Breyfogle prospect (Ag, Pb, Zn, As)	Two poorly exposed veins are in biotite gneiss intruded by quartz monzonite. The principal vein averages 1.5 ft thick, dips 80° SE., and can be traced for 50 ft along its N. 60° to 70° E. strike. The second vein, exposed only in a pit, is 2 ft thick, strikes N. 50° E., and dips 90°. Both veins are leached, and mainly quartz with calcite, limonite, specularite, arsenopyrite, and galena. The gneiss surrounding the veins is limonitic and silicified.	A flooded shaft estimated to be about 100 ft deep and three small prospect pits.	Six samples were taken. The principal vein is estimated to average 0.26 oz/ton silver, 0.07% lead, and 0.049% zinc, based on two chip samples. A chip sample across the second vein had 1.9 oz/ton silver, 0.19% lead, and 0.18% zinc. Samples also contained 0.011 to 0.02% arsenic. Two grab samples of dump material had no significant mineral concentrations. The vein exposures are too small and low grade to be classified resources. However, the chip samples were of leached surficial material. A grab sample of quartz from a stockpile at the shaft contained 3.1 oz/ton silver, 1.0% lead, and 0.7% zinc, indicating higher grade material may be at depth, below the leached zone. An examination of the vein exposure in the flooded shaft would give a better indication of possible resources.
5	Prospect No. 5* (As)	A 1.5-ft-thick vein is exposed for 5 ft in biotite gneiss. The vein strikes N. 20° E., dips 80° SE., and is composed of quartz with limonite and pyrite.	A shaft 6 ft deep.	A chip sample across the vein had 11 ppm copper, 12 ppm lead, 120 ppm arsenic, and 40 ppm zinc.
6	Prospect No. 6* (Cu, As)	Adjoining the study area boundary is a vein that strikes N. 35° W., dips 85° SW., and is mainly quartz with malachite and arsenopyrite. The vein exposure is 2 ft thick, 10 ft long, and in limonitic, silicified, biotite gneiss intruded by quartz monzonite. There is no indication that the vein extends into the study area.	Small prospect pit.	Two samples were taken. A chip sample across the vein had 90 ppm copper; 160 ppm arsenic, and 40 ppm zinc. A grab sample of quartz from the dump contained 1.2% copper, 140 ppm cobalt, 190 ppm arsenic, and 59 ppm zinc. The significantly higher copper concentrations in the grab sample suggests that copper-bearing material may be at depth.

TABLE 5.--Summary descriptions of the mineral sites within and adjacent to the South McCullough Mountains study area, Clark County, NV (continued)

Map no. (fig. 2)	Name	Summary	Workings and production	Sample and resource data ^{1/}
7	Prospect No. 7	A vein exposure 4.3 ft thick and 10 ft long, strikes N. 55° W., and dips 65° NE., in limonitic, silicified, biotite gneiss that has been intruded by quartz monzonite. The vein is mainly limonitic quartz breccia.	One small pit.	A chip sample across the vein had no significant mineral concentrations.
8	Prospect No. 8* (As)	A poorly exposed, 5.8-ft-thick, limonitic quartz vein strikes N. 44° E., and dips 53° NW. in biotite gneiss.	One adit 8 ft long.	A chip sample across the vein contained 200 ppm arsenic and 34 ppm zinc.
9	<u>Silver King prospect</u> (Au, Cu, As)	One principal and two smaller veins are exposed in an area that measures 1,000 by 2,000 ft. The veins are 0.3 to 7.0 ft thick, trend N. 44° E. to S. 42° E., dip steeply, and are in silicified, limonitic, biotite gneiss. The principal vein averages 2.7 ft thick and can be traced for 1,000 ft. Its surface exposures are leached and brecciated, and composed of quartz, calcite, and sparse limonite and malachite. Boxwork on the dumps suggest that sulfides are a few feet below the surface.	A 15-ft adit and four prospect pits. The workings indicate a few tons of ore production; however, none was recorded.	Seven samples were taken; five chip samples across the principal vein and two across smaller veins. The samples had as much as 1,800 ppm copper, 190 ppm arsenic, 390 ppm lead, and 310 ppm zinc. One sample had 0.01 oz/ton gold. All the samples were from leached outcrops. The vein exposures are too low grade to be classified resources. However, a sample with copper (from the principal vein) and a sample with gold (from a smaller vein) plus the malachite and boxwork indicate that resources may occur at depth.
10	Apprentice prospect*	A 3-ft-thick pegmatite dike strikes north and dips 55° W. in limonitic biotite gneiss. The dike is mostly quartz with microcline.	A 20-ft adit.	A chip sample across the dike had no significant mineral concentrations.
11	War Lord prospect* (W)	To the east of the study area is a 4.6-ft-thick, 78-ft-long vein exposure that strikes N. 34° E., and dips 80° SE., in limonitic, silicified schist that contains calcite, hornblende, biotite, and garnet. The vein is composed of small lenses of fine-grained quartz that contain malachite and scheelite. The zone trends towards the study area but probably does not extend into it.	Two small prospect pits and a chute to carry ore down to a small, partially dismantled, semiautogenous mill.	Six samples were taken. Two chip samples across the vein had as much as trace gold, 280 ppm copper, 790 ppm tungsten, and 120 ppm zinc. A grab sample of quartz from the ore chute contained 1,300 ppm tungsten. Three grab samples of quartz from the workings and the mill contained as much as 0.02 oz/ton silver, 26 ppm copper, 800 ppm tungsten, and 190 ppm zinc.

^{1/} Precious metals are reported in troy ounces.

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