

**MINERAL RESOURCE POTENTIAL OF THE BLANCO MOUNTAIN AND
BLACK CANYON ROADLESS AREAS, INYO AND MONO COUNTIES, CALIFORNIA**

SUMMARY REPORT

By

Michael F. Diggles and Richard J. Blakely
U.S. Geological Survey

and

Richard L. Rains and Steven W. Schmauch
U.S. Bureau of Mines

STUDIES RELATED TO WILDERNESS

Under the provisions of the Wilderness Act (Public Law 88-577, September 3, 1964) and related acts, the U.S. Geological Survey and the U.S. Bureau of Mines have been conducting mineral surveys of wilderness and primitive areas. Areas officially designated as "wilderness," "wild," or "canoe" when the act was passed were incorporated into the National Wilderness Preservation System, and some of them are presently being studied. The act provided that areas under consideration for wilderness designation should be studied for suitability for incorporation into the Wilderness System. The mineral surveys constitute one aspect of the suitability studies. The act directs that the results of such surveys are to be made available to the public and be submitted to the President and the Congress. This report discusses the results of a mineral survey of the Blanco Mountain (5059) and Black Canyon (5061) Roadless Areas, Inyo National Forest, Inyo and Mono Counties, California. The areas were established as further planning areas during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

SUMMARY

On the basis of geologic, geochemical, and geophysical investigations and a survey of mines and prospects, the mineral resource potential for gold, silver, lead, zinc, tungsten, and barite of the Blanco Mountain and Black Canyon Roadless Areas is judged to be low to moderate, except for one local area that has high potential for gold and tungsten resources.

A geochemical survey detected moderately anomalous amounts of lead, copper, and zinc and less anomalous concentrations of tungsten, gold, and silver. Elements in anomalous samples were grouped as suites known to form in various ore deposits. Four element suites that may be indicative of mineralization are recognized in the White Mountains: (1) lead, zinc, and silver in carbonate rocks; (2) copper, barite, and lead in veins and replacement bodies; (3) tungsten, molybdenum, and bismuth in skarns; and (4) gold and arsenic in mineralized quartz veins. The assessment of the areas of resource potential was made in part by the application of ore deposit models to the geochemical results.

A mineral deposit survey by the U.S. Bureau of Mines indicates that there are no properties with identified mineral resources in the Blanco Mountain Roadless Area. There is one active placer claim. In the Black Canyon Roadless Area, two properties have 40,000 tons of indicated and inferred low-grade gold, silver, or lead-bearing rock. Five properties near this roadless area have 150,000 tons of indicated and inferred low-grade gold, silver, lead, zinc, or tungsten-bearing rock. About 90 percent of this tonnage is estimated to occur at the Mirage-Mariposa and the Hope mines.

The roadless areas have no known resource potential for geothermal energy, coal, oil, or gas.

INTRODUCTION

Location and access

The Blanco Mountain and Black Canyon Roadless Areas encompass approximately 27 mi² and 48 mi², respectively, in the Inyo National Forest in Inyo and Mono Counties, California (fig. 1). The Black Canyon Roadless Area is 6 mi east, and the Blanco Mountain Roadless Area is 20 mi northeast of Bishop. The terrain is rugged and steep, with relief of about 6,000 ft along most of the west side of the White Mountains. Elevation ranges from 11,278 ft at Blanco Mountain to about 4,500 ft in Owens Valley to the west of the range. The climate is arid to semi-arid, and at least two climatic life zones are present because of the great range in elevation. Most of the vegetation is typical of the Upper Sonoran and Transition zones, consisting of sagebrush, rabbitbrush, and sparse grasses at lower elevations and pinon pine, juniper, and mountain mahogany on mountain slopes. At higher elevations limber pine and bristlecone pine are present; the highest parts of the White Mountains are above timberline. Perennial vegetation along streams includes willow, aspen, wild rose, and grasses.

Access to the Blanco Mountain Roadless Area and east side of the Black Canyon Roadless Area is by the road to the University of California research station on Mount Barcroft. Spur roads following Wyman Creek and part of the Crooked Creek drainages provide access to most of the perimeter of the Blanco Mountain Roadless Area. Several roads lead east from Bishop to the western and interior parts of the Black Canyon Roadless Area.

Previous and present studies

California State Mineralogist and State Mining Bureau publications by Hanks (1884), Fairbanks (1894), Crawford (1896a, b, c) and Aubury (1904) recorded information on the producing mines in the areas. The most complete early geologic studies on the White Mountains are a report by Knopf (1914) and a comprehensive general study by Knopf that contains a section by Kirk (in Knopf, 1918) that contains a bibliography that includes geologic studies published prior to 1918. Updated information on local mines is given by Tucker (1926), Tucker and Sampson (1938), Eric, (1948), and Norman and Stewart (1951).

During the 1960's and 1970's, the U.S. Geological Survey published detailed geologic maps of this area at a scale of 1:62,500. Most of the two roadless areas are covered by the Blanco Mountain quadrangle mapped by Nelson (1966b). Remaining parts of the area are covered by geologic maps of the Bishop and Big Pine quadrangles (Bateman, 1965), Waucoba Mountain quadrangle (Nelson, 1966a), and the Mount Barcroft quadrangle (Krauskopf, 1971). A number of reports describing the stratigraphy, structure, economic geology, hydrology, and other aspects of White Mountain geology have also been published. A geologic map of the roadless areas within the White Mountains was compiled by McKee and others (1982). Additional studies related to granitic rocks in the area are included in Anderson (1937), Emerson (1966), and Crowder and others (1973). Stratigraphic and paleontologic studies of the area include Nelson (1962), Nelson and Durham (1966), and McKee and Gangloff (1969).

The U.S. Geological Survey carried out field investigations in the summer of 1980. The work included field checking existing geologic maps and geochemical sampling. A total of 386 stream-sediment, 363 panned heavy-mineral, and 302 rock samples were collected for chemical analysis and provide the geochemical data base for this report. Results of these analyses and statistical summaries were presented by Diggles and others (1982).

The U.S. Bureau of Mines conducted an extensive library search, supplemented by several unpublished or private information sources obtained mostly through claim owners. U.S. Forest Service and U.S. Bureau of Land Management records supplied information on current mining claims. All of the Inyo and Mono County mining claim records were reviewed and those pertaining to the roadless areas were organized by drainage or geographical area and plotted on base maps. Field studies by Bureau of Mines from June to October 1981 identified 53 mining properties, from which 665 samples were collected. Samples were analyzed by fire-assay, atomic-absorption, and inductively-coupled argon-plasma-spectrophotometry methods. At least one sample from each property was analyzed by semiquantitative spectrography. A summary of the results of these studies are in open-file reports by Schmauch and others (1982) and by Rains and others (1983). Additional analytical data and detailed property maps are on file at the U.S. Bureau of Mines Western Field Operations Center in Spokane, Washington.

GEOLOGY

Rocks in the roadless areas range from upper Proterozoic sedimentary types to unconsolidated Holocene deposits. These can be divided into four major groups: (1) Upper Proterozoic through Cambrian strata consisting of a sequence of carbonate, sandstone, and shale deposited in a shallow-marine continental-shelf environment; (2) Mesozoic plutonic rocks of the Inyo batholith, an eastern extension of the Sierra Nevada batholith that consists predominantly of granite (nomenclature of Streckeisen, 1976); (3) Upper Tertiary, mainly Miocene and Pliocene, volcanic rocks consisting of olivine basalt flows found in the Blanco Mountain Roadless Area; and (4) Quaternary stream and alluvial fan deposits.

The Proterozoic rocks comprise most of four formations that are composed of about equal amounts of carbonate and quartzose clastic rocks. The oldest rocks are phyllites with minor fine-grained sandstone and interbedded dolomite of the Wyman Formation. Unconformably overlying these rocks is the gray, fine- to medium-grained, medium-bedded Reed Dolomite, which is conformable with the overlying Deep Spring Formation. The Deep Spring Formation consists of mostly limestone and dolomite at the bottom and quartzite and shale at the top. Locally, the youngest Proterozoic rocks belong to the lower part of the Andrews Mountain Member of the Campito Formation; the Andrews Mountain Member is a thick sequence of dark, thin- to medium-bedded blocky quartzite.

The lowest Cambrian strata comprise the upper part of the Andrews Mountain Member and the Montenegro Member of the Campito, which consists of thin-bedded siliceous

siltstone and has yielded the lowest occurrence of olenellid trilobites in the region. The Blanco Mountain Roadless Area contains only these Proterozoic and Cambrian units. The Black Canyon Roadless Area contains additional Paleozoic rocks. The Poleta Formation conformably overlies the Campito Formation and consists of medium-bedded to massive limestone at its base, and shale, quartzite, and thin- to medium-bedded limestone in its upper part. The Harkless Formation overlies the Poleta, but is not entirely exposed in the Black Canyon Roadless Area. The Harkless Formation consists mostly of siltstone, quartzite, and local limestone beds and is in thrust contact with the Emigrant Formation, which is composed of shale, thin-bedded silty limestone.

Granitic rocks crop out over about a third of the Blanco Mountain Roadless Area and in a small part of the Black Canyon Roadless Area. The granitic rocks intrude and locally metamorphose the thick section of older sedimentary rocks. The plutons generally have sharp contacts and are typically surrounded by contact-metamorphic aureoles a few hundred feet wide. The Blanco Mountain Roadless Area contains two granitic plutons, the Beer Creek and the Sage Hen Flat plutons. The Beer Creek pluton is Jurassic in age and consists of medium- to coarse-grained porphyritic rock with large euhedral orthoclase phenocrysts. The Sage Hen Flat pluton is a medium-grained, quartz-poor rock of Jurassic and (or) Cretaceous age. A small granitic pluton in the Black Canyon Roadless Area is in Redding Canyon. It is composed of coarse-grained porphyritic quartz monzonite of Jurassic and (or) Cretaceous age.

Upper Tertiary volcanic rocks are mainly medium-gray, fine-grained, and locally vesicular olivine basalt and some andesites that occur in scattered locations in the northern half of the Blanco Mountain Roadless Area. The discontinuous perched outcrops are remnants of once extensive lava flows that locally cover stream gravels. These areas have since been uplifted and deeply eroded.

At least three distinct periods of deformation are recognized in the roadless areas. The oldest structures are found only in the Proterozoic and Paleozoic strata and record a period of thrusting before emplacement of the Inyo batholith. The thrusting event displaced relatively younger Cambrian strata over relatively older Cambrian rocks that elsewhere in the White Mountains are conformable. The second period of deformation is related to the emplacement of the Mesozoic Inyo batholith. Local deformation is related to the various plutonic intrusions that comprise this batholith. The third phase of deformation, involving Tertiary through Holocene basin and range block faulting, is responsible for the present configuration of the White Mountains. The White Mountains are one of the best examples of a block-faulted range in the Basin and Range physiographic province.

GEOCHEMICAL STUDIES

Diggles (1983) described the geochemical anomalies detected in roadless areas within the White Mountains. That summary of the geochemical results showed that one panned-concentrate sample from the Blanco Mountain Roadless Area yielded anomalous amounts of molybdenum and bismuth. These elements are associated with mineralized skarns and suggest that tungsten may occur as well. The Reed Dolomite-Sage Hen Flat pluton contact, which the drainage crosses, is a likely place for skarn type of deposits.

Fourteen drainages in the Black Canyon Roadless Area produced anomalous amounts of a few elements in panned-concentrate samples. These drainages form two groups. The area between Silver Canyon and Poleta Canyon contained a few samples with anomalous amounts of lead, copper, zinc, gold, silver, and tungsten. Samples from the Marble Canyon area contained a few anomalies of gold, silver, lead, copper, zinc, and tungsten. No anomalies were found in the unconcentrated samples from this area.

The results of the geochemical survey indicate that mineralization occurs primarily as (1) silver, lead, and zinc in carbonate rocks; (2) lead, copper, and barite in veins, replacement bodies; (3) tungsten, molybdenum, and bismuth from a possible skarn zone; and (4) gold and arsenic in mineralized quartz veins.

GEOPHYSICAL STUDIES

Aeromagnetic data provides information on rock type and structure at depth and helps delineate the subsurface contacts between plutonic and sedimentary rocks in the study area. This is important in a mineral resource assessment because certain igneous-sedimentary contacts are the site of mineralization.

An aeromagnetic survey was flown along east-west flight lines spaced 1 mi apart and at a constant barometric altitude of 14,000 ft across the White Mountains. The data produced by this survey were compiled into contour maps of total magnetic field anomalies from which the following geophysical interpretations were made.

In the Blanco Mountain Roadless Area, the Beer Creek and Sage Hen Flat plutons create a distinctive magnetic anomaly. The magnetic intensity patterns suggest that the southwest margin of the Beer Creek pluton dips to the southwest below the Wyman Formation and other Proterozoic, as well as Paleozoic sedimentary rocks. This anomaly extends over the granite of Sage Hen Flat, indicating that the Proterozoic sedimentary rocks separating the Beer Creek pluton from the Sage Hen Flat pluton form only a thin septum.

A broad magnetic low occurs over the widespread Proterozoic and Paleozoic sedimentary rocks at the southern end of the White Mountains, suggesting that the sedimentary rocks are very thick and that plutonic rocks are not present near the surface. Small plutons, such as the Redding Canyon pluton, do not produce significant magnetic anomalies.

MINING ACTIVITY

Three principal mining districts within the Black Canyon Roadless Area are the Bishop, Black Canyon, and Poleta districts. Eleven other mining districts, the Big Pine, Bishop Creek, Deep Springs, Laws, Marble Canyon, Pine Mountain, Redding Canyon, Silver Canyon, Westgard Pass, White Mountains, and Wyman Creek districts, are partially within the Black Canyon and Blanco Mountain Roadless Areas.

Mining activity began in the White Mountains in the early 1860's, but no claims were filed in the Blanco Mountain Roadless Area until about 1900, and there is no evidence of earlier prospecting. At least 31 lode claims and 18 placer claims were filed on 11 properties in this area. The most recent lode claim was filed in 1977; one group of three placer claims is active. There are no mines with recorded production in or near the Blanco Mountain Roadless Area.

Since 1879, about 740 mining claims have been located within the Black Canyon Roadless Area. Sixteen of these were placer claims. The only patented mining claim, which covers the Poleta mine, is located just outside the roadless area. According to U.S. Bureau of Land Management records, 53 lode claims are active.

The first reported mining activity was in the 1860's, when the Little Gem (also called Georgia and X-Ray) mine (loc. 13) was worked (Knopf, 1918). The gold ores from the Little Gem and Gray Eagle mines (loc. 15) were processed in an arrastra in Redding Canyon.

The Mirage-Mariposa (Golden Mirage) mine (loc. 14) was first worked in 1912. Five carloads of gold-bearing ore were shipped from this mine and from the Gray Eagle and Little Gem mines in 1912 (Knopf, 1914).

During the 1950's, scheelite-bearing rock was discovered at the R and R mine, outside the roadless area. In 1952, several thousand tons of ore of unknown grade were produced and shipped to the Round Valley Tungsten Company (Bateman, 1956). An estimated 20,000 tons of rock and ore has been removed from the glory hole of the R and R mine. The property is currently known as the Mirage-Mariposa mine.

The Grand Central, Star Wano, and Golden Jubilee claims were surveyed for patent in 1907 and were collectively named the Black Canyon Consolidated mine, sometimes referred to as the Black Canyon mine. Aubury (1904) reported that the mine had unspecified lead-silver

production. The property is currently known as the Trinity prospect (loc. 29).

The Poleta mine (loc. 6), adjacent to the Black Canyon Roadless Area, is one of the oldest mines in the area and provided the mining excitement of 1881 (Chalfont, 1933) when it was patented. By 1896, ore was being processed by water driven arrastra. During the following 50 years, several people owned or operated the mine and mill and by 1938, a 12-ton per day ball mill with a 96 percent recovery rate had processed 4,000 tons of ore (Tucker and Sampson, 1938). The Poleta mine idle from 1941 to 1958, was in operation from 1958 to 1962, and is currently idle.

Another mining operation just outside the Black Canyon Roadless Area was the Mineral Point-Sanger-Hope group, sometimes referred to as the Hope group (loc. 28). Nothing is known about the property before 1920. In 1925, the Hope group was leased to W. A. Sanger and Robert Swank and later to the Tonopah Dividend Mining Company of San Francisco, Calif. From 1930 to 1950, it was known as the Eagle and Westward Eagle No. 2. U.S. Bureau of Land Management records show Argus Resources as claimants of the Hope since 1946. In 1947, Morris Albertoli and Associates of Big Pine, Calif., operated the property. In 1980, Dean Karlberg located the Carol J mine (loc. 25) on part of the property. This property has sometimes been referred to as the Black Canyon mine or group. It is not to be confused with the Black Canyon Consolidated mine which is now known as the Trinity prospect.

Most of the production from the Black Canyon Roadless Area was from 1880 to about 1900, when gold was mined, from 1925 to 1947 when gold, silver, lead, and some copper were mined, and in the 1950's when tungsten was mined. The Poleta mine produced gold and silver from 1892 to 1962. During the 1950's, two properties were developed on a scheelite deposit. Production records are incomplete and the grade is not known. Two mines in, and six mines adjacent to the Black Canyon Roadless Area have had production (table 1). Records are not available for production prior to 1891.

Mines and prospects examined during this study are shown on figure 2 and on the accompanying map. Summary descriptions for all properties are in table 2. Those with mineral resource potential are underlined. Mineral resource classifications used in this table are from U.S. Bureau of Mines and U.S. Geological Survey (1980). Indicated and inferred resource categories reflect degrees of geologic assurance and sample density. Properties for which no resources were calculated because of the lack of sufficient geologic control are also included in this table because they may contain undiscovered resources.

It is not likely that many of the mines with small reserves could operate profitably as single entities. Given favorable economic conditions, however, it is possible for several groups of mines with indicated and inferred resources to operate through centrally located processing facilities. Because of the relatively small tonnages at the individual properties, these mines could best be developed by small-scale mining operations.

MINERAL RESOURCE ASSESSMENT

Geochemical samples of stream sediment, panned concentrate, and rock were collected and analyzed from all drainages in the roadless areas (Diggles, 1983). Groups of elements that are known to commonly occur together including silver-lead-zinc, tungsten-molybdenum-bismuth, gold-arsenic, and copper-lead, were plotted on a map. From this information, areas with metal anomalies were identified. Site-specific studies of mines and prospects provided additional information for defining areas with resource potential.

Eight areas within the Blanco Mountain and Black Canyon Roadless Areas are identified as having anomalous amounts of various metals in stream-sediment samples and the location of areas with mineral resource potential are shown on figure 2.

Black Canyon Roadless Area

Area A

Samples from a small drainage between Poleta Canyon and Silver Canyon contain anomalous amounts of tungsten, gold, silver, antimony, lead, and barite. These metals are probably derived from mineralized quartz veins and barite veins in metasedimentary rocks. The Sand A Gold and Barite Queen prospects in this area have gold and barite in veins. A tungsten anomaly from an older alluvial deposit may have been derived from skarns or quartz veins that eroded to produce the alluvial deposit. The mineral resource potential for area A is low for gold, lead, silver, zinc, and barite.

Areas B and C

Gold-bearing veins in granite were mined in the Gray Eagle mine (loc. 15) inside the roadless area in Redding Canyon and in the Mirage-Mariposa and Little Gem mines (locs. 14 and 13 respectively) outside the roadless area. The past-producing mines in the vicinity suggest area B has moderate resource potential and area C has high resource potential for gold. Area C also has a high resource potential for tungsten.

Area D

In the upper Black Canyon drainage, the Hope and Carol J mines (locs. 28 and 25 respectively) produced silver, lead, zinc, and gold from replacement-ore zones in carbonate rocks. Area D has moderate resource potential for silver, lead, zinc, and gold.

Area E

Stream-sediment samples from three tributaries on the south side of Black Canyon contained anomalous amounts of lead, silver, and gold. Prospects in this area, including the Hall Extension (loc. 35), were developed on lead and silver-bearing quartz veins in carbonate rocks. The Trinity prospect (loc. 29) is on a sheared quartzite-dolomite contact zone that contained gold-bearing quartz veins.

Area E has low resource potential for lead, silver, and zinc in carbonate rocks and for gold in quartz veins associated with shear zones in quartzite and dolomite.

Blanco Mountain Roadless Area

Areas F and G

Two mines northwest of the roadless area and the Blizzard Extension prospect (loc. 43) in the roadless area were developed on mineralized parts of the contact zone between the Reed Dolomite and the Sage Hen Flat pluton. Small gold-bearing quartz veins crop out on both rock types in the contact area at the Blizzard Extension prospect. Geochemical sampling showed tungsten and bismuth anomalies in both areas. Area G has a moderate resource potential for gold in vein deposits. Areas F and G have low resource potential for tungsten in skarn deposits.

Area H

On the east side of the roadless area, erosional remnants of Tertiary olivine basalt flows cover parts of a south-flowing early(?) Tertiary stream channel. Mining in this area has yielded an unknown and probably small amount of gold from placer deposits. Area H has a low potential for additional gold in placer deposits.

REFERENCES CITED

Anderson, G.H., 1937, Granitization, albitization, and related phenomena in the northern Inyo Range of California-Nevada: Geological Society of America Bulletin, v.48, p. 1-74.
Aubury, L. E., 1904, Map and register of mines and minerals

of Inyo County, California: California State Mining Bureau, Louisiana Purchase Exposition.
Bateman, P. C., 1956, Economic geology of the Bishop tungsten district, California: California Division of Mines and Geology Special Report 47, 87 p.
———1965, Geology and tungsten mineralization of the Bishop district, California: U.S. Geological Survey Professional Paper 470, 208 p.
Chalfant, W. A., 1933, The story of Inyo: Bishop, California, Chalfant Press Inc., 430 p.
Crawford, J. J., 1896a, Argentiferous galena: California State Mining Bureau, Thirteenth report of the State Mineralogist, p. 32-34.
———1896b, Gold: California State Mining Bureau, Thirteenth report of the State Mineralogist, p.64-503.
———1896c, Marble, limestone, and lime: California State Mining Bureau, Thirteenth report of the State Mineralogist, p. 627-633.
Crowder, D. F., McKee, E. H., Ross, D. C., and Krauskopf, K. B., 1973, Granitic rocks of the White Mountains area, California-Nevada: age and regional significance: Geological Society of America Bulletin, v. 84, p. 285-296.
Diggles, M. F., 1983, Map and interpretation of geochemical anomalies in the White Mountains, Blanco Mountain, Birch Creek, and Black Canyon Roadless Areas, White Mountains, California and Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1361-B, scale 1:62,500.
Diggles, M. F., Dellinger, D. A., Sutley, S. J., Fey, D. L., and Hill, R. H., 1982, Chemical data for samples of rock, stream-sediment, and nonmagnetic dense-mineral concentrate in the White Mountains, Blanco Mountain, Birch Creek, and Black Canyon Roadless Areas, White Mountains, California and Nevada: U.S. Geological Survey Open-File Report 82-984, 188 p.
Emerson, D. O., 1966, Granitic rocks of the Mt. Barcroft quadrangle, California-Nevada: Geological Society of America Bulletin, v. 77, p. 127-152.
Eric, J. H., 1948, Tabulation of copper deposits of California, in Copper in California by Jenkins, O. P., ed: California Division of Mines Bulletin 144, p.197-357.
Fairbanks, H. W., 1894, Preliminary report on the mineral deposits of Inyo, Mono, and Alpine Counties: California State Mining Bureau, Annual Report of the State Mineralogist, v. 12, p. 472-478.
Hanks, H. G., 1884, Catalogue and description of the minerals of California as far as known, with special reference to those having an economic value: California State Mining Bureau, Annual Report of the State Mineralogist, v. 4, p. 61-398.
Knopf, Adolph, 1914, Mineral resources of the Inyo and White Mountains, California: U.S. Geological Survey Bulletin 540, pt. 1, p. 81-121.
———1918, A geologic reconnaissance of the Inyo Range and the eastern slope of the Sierra Nevada, California, with a section on The stratigraphy of the Inyo Range, by Edwin Kirk: U.S. Geological Survey Professional Paper 110, 130 p.
Krauskopf, K. B., 1971, Geologic map of the Mount Barcroft quadrangle, California-Nevada: U.S. Geological Survey Geologic Quadrangle Map GQ-960, scale 1:62,500.
McKee, E. H., Diggles, M. F., Donahoe, J. L., and Elliott, G. S., 1982, Geologic map of the White Mountains Wilderness and roadless areas, California and Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1361-A, scale 1:62,500.
McKee, E. H., and Gangloff, R. A., 1969, Stratigraphic distribution of archaeocyathids from the Silver Peak and White and Inyo Mountains of western Nevada and eastern California: Journal of Paleontology, v. 43, p. 716-726.
Nelson, C. A., 1962, Lower Cambrian-Precambrian succession, White-Inyo Mountains, California: Geological Society of America Bulletin, v. 73, p. 139-144.
———1966a, Geologic map of the Waucoba Mountain quadrangle, Inyo County, California: U.S. Geological

- Survey Geologic Quadrangle Map GQ-528, scale 1:62,500.
- 1966b, Geologic map of the Blanco Mountain quadrangle, Inyo and Mono Counties, California: U.S. Geological Survey Geologic Quadrangle Map GQ-529, scale 1:62,500.
- Nelson, C. A., and Durham, J. W., 1966, Guidebook for field trip, Precambrian-Cambrian succession, White-Inyo Mountains, California: Geological Society of America, 79th Annual Meeting, San Francisco, Calif., 1966 (Paleontological Society Section), 17 p.
- Norman, L. A., and Stewart, R. M., 1951, Mines and mineral resources of Inyo County: California Journal of Mines and Geology, v. 47, p. 17-223.
- Rains, R. L., Horn, M. C., and Neumann, T. R., 1983, Mineral investigations of the Black Canyon RARE II Area (No. 5061), Inyo County, California: U.S. Bureau of Mines Open File Report MLA 85-83, 21 p.
- Schmauch, S. W., Lipton, D. A., Gabby, P. N., Barnes, D. J., and Horn, M. C., 1982, Mineral investigations of the Blanco Mountain RARE II Area (No. 5059), Inyo and Mono Counties, California: U.S. Bureau of Mines Open File Report MLA 146-82, 12 p.
- Streckeisen, A. L., 1976, To each plutonic rock its proper name: Earth Science Review, v. 12, p. 1-33.
- Tucker, W. B., 1926, Inyo County, in Report XXII of the State Mineralogist: California State Mining Bureau, Mining in California, v. 22, p. 453-530.
- Tucker, W. B., and Sampson, R. J., 1938, Mineral resources of Inyo county: California Journal of Mines and Geology, v. 36, p. 368-500.
- U.S. Bureau of Mines and U.S. Geological Survey, 1980, Principles of a resource/reserve classification for minerals: U.S. Geological Survey Circular 831, 5 p.

Table 1.--Recorded production from lode deposits in the Black Canyon Roadless Area
[Data from U.S. Bureau of Mines files. N.R., not reported; underlined properties are outside the study area]

Property	Year(s)	Tons of production	Gold (ounces)	Silver (ounces)	Copper (pounds)	Lead (pounds)
<u>Hope and Carol J¹ mine</u>	1925-1951	2,696	124.63	15,706	2,592	220,744
Gray Eagle mine ²	1933-1940	11	38.6	23	33	N.R.
<u>Golden Mirage² (Mariposa) mine</u>	1912	79	160.4	170	N.R.	N.R.
<u>Little Gem² (Georgia, X-Ray mine)</u>	1891-1896	N.R.	162	N.R.	N.R.	N.R.
<u>Mariposa mine³</u>	1954-1957	N.R.	N.R.	N.R.	N.R.	N.R.
<u>Poleta mine</u>	1892-1962	6,049	3,842.7	794	N.R.	N.R.
<u>R and R mine³</u>	1952	N.R.	N.R.	N.R.	N.R.	N.R.
Trinity prospect ⁴ (Black Canyon Consolidated mine)	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
Totals		8,835	4,328.33	16,693	2,625	220,744

¹ Tucker (1926) reported that 510 tons of lead-silver production was valued at \$9,400. This record is apparently incomplete; Bureau of Mines records indicate higher figures. Bureau records also show the Eagle properties had produced a total of 20 pounds of zinc.

² In 1912, five carloads of ore were shipped from the Gray Eagle, Golden Mirage, and X-Ray mines (Knopf, 1914).

³ Two properties, the R and R and the Mariposa, were reported to have produced tungsten. Bateman (1956) reported several thousand tons for the R and R claims, grade unknown. The owner of the Mariposa mine stated that the mine operated between 1954 and 1957 and that one month's production was 500 tons of unknown grade (Buzz Perego, written commun., 1981). Amounts for the rest of that time period are unknown.

⁴ Aubury (1904) reported unspecified production from the Black Canyon Consolidated mine, now known as the Trinity prospect.

Table 2.--Mines, prospects, and mineralized areas in the Black Canyon and Blanco Mountain Roadless Areas
 [Underlined names refer to properties with resource potential; those not underlined have no potential or are
 poorly exposed and a determination cannot be made]

Map No.	Name (commodity)	Summary	Workings and production	Sample data and resources
Black Canyon Roadless Area				
1	White Rock prospect (gypsum)	Two white granular gypsum veins up to 0.8 ft thick are exposed 20 ft along strike in recrystallized limestone. One vein strikes N. 78° E. and dips 75° NW.; the other strikes N. 50° W. and dips 60° SW. Small selenite crystals are present in the gypsum vein.	Two small prospect pits are on the property.	Two chip samples of gypsum contained no metal values.
2	Happy Day prospect (gold, silver)	A 3-ft-thick silty, oolitic recrystallized limestone crosscut by quartz veinlets occurs along a shale-limestone contact. The contact strikes north and dips vertically. Minor visible galena occurs in the recrystallized limestone.	Prospect workings consist of one shaft 15 ft deep, two trenches 25 and 44 ft long, and one prospect pit.	Of three grab samples of siliceous limestone, two contained 0.012 and 0.294 oz gold per ton and two had 0.46 to 11 percent lead. One contained 3.9 oz silver per ton. One chip sample of limestone contained 1.2 oz silver per ton and 1.7 percent lead.
3	<u>Sand A Gold prospect</u> (gold, silver)	Quartz veins up to 3 ft. thick trend northeast and dip 80° NW. to vertically in hornfels and slate. They are massive, vuggy in places, and iron oxide stained along fractures. Pyrite, hematite after pyrite, and copper stains are also present.	Workings consist of four adits totalling 1,100 ft (including 820 ft of development in the lower adit) two shafts totalling 90 ft, and three prospect pits.	About 2800 tons of vein quartz averages 0.088 oz gold per ton and 0.63 oz silver per ton. Potential is moderate for gold-silver resources.
4	Ground Hog prospect (gold)	Massive milky white quartz vein up to 5 ft thick strikes N. 33° E. and dips 70° SE. in hornfels that strikes N. 17° E. and dips 25° NW.	One prospect pit is 5 by 8 ft.	One chip and one grab sample of quartz contained no gold or silver.
5	Barite Queen prospect (barite)	A vein of barite up to 1.7 ft thick strikes north for 85 ft and dips vertically in thin-bedded slate.	One adit is 27 ft long and one trench is 20 ft long.	Three chip samples of the barite vein contained 54.8 to 56.3 percent barium sulfide. One chip sample of slate contained no significant metal values.
6*	<u>Poleta mine</u> (gold, silver)	The Poleta mine lies on the southwest limb of an anticline that plunges steeply to the south. Country rock is thin-bedded limestone and phyllite. A quartz fissure vein, localized along a bedding plane, is located in the hanging wall of a zone of highly altered gouge that is up to 6 ft thick. The vein strikes northeast, dips 20° to 50° NW, and ranges in thickness from 2 in. to 2.5 ft. Gold-bearing pyrite in the vein is altered to iron oxide pseudomorphs carrying free gold. The vein pinches out to the east and is truncated on the west by a highly brecciated fault zone that strikes northeast and dips 35° to 45° NW. (Bateman, 1956).	Mine workings consist of 15 shafts, four adits, and numerous prospect pits; most shafts and adits are caved or are less than 100 ft long. The main working consists of a 400-ft-long adit with six levels and a 600-ft-deep winze. Bureau of Mines files show that about 5,000 oz of gold and 1000 oz of silver have been produced between 1892 and 1961.	Twenty-one chip and five grab samples were taken of quartz and shear zone: five chip samples of quartz assayed 0.066 to 1.10 oz per ton gold; two grab samples of quartz contained 0.124 to 0.616 oz gold per ton. Two chip samples and one grab sample of quartz contained 0.4 to 0.6 oz silver per ton. Five chip samples of quartz contained 0.07 to 0.51 percent lead. Potential for gold-silver-lead resources
7*	Jack Rabbit prospect (gold, silver)	Fractured iron oxide-stained quartz veins up to 4 ft thick strike N. 40° to 60° E. and dip 25° to 75° SE. in granitoid rocks. The pyrite-bearing quartz veins are discontinuous.	One adit 25 ft long, one 10-ft-deep shaft, and three prospect pits explore the property.	Four chip and three grab samples of quartz were taken; four contained trace to 0.048 oz gold per ton, and three contained 0.3 to 1.0 oz silver per ton.
8*	<u>Ursi Major prospect</u> (gold)	Quartz veins up to 1.0 ft thick strike northeast and northwest and dip 45° to 60° E. in quartz monzonite. The veins are fractured, iron oxide-stained, and have a trace of copper stain.	Five adits, (four totaling 180 ft in length and one caved), one 20-ft-long inclined shaft, and six prospect pits explore the property.	There are about 10,400 tons of subeconomic resources with an average grade of 0.14 oz gold per ton. The potential is low for additional gold resources.
9	Stray Dog prospect (silver, tungsten)	A small garnet-pyroxene-epidote tactite pod grades rapidly into quartz monzonite and limestone.	A 15- by 90-ft glory hole from which about 1,100 tons of material have been removed and a 4- by 8-ft deep prospect pit in limestone are on the property.	One grab and four chip samples of tactite were taken; four contained 0.3 to 0.4 oz silver per ton and four contained from 0.04 to 0.62 percent tungsten trioxide. Two samples of limestone contained 0.2 and 0.3 oz silver per ton. One sample of quartz monzonite contained 0.3 oz silver per ton.
10	Keystone prospect (gold, silver)	Shear zones up to 4 ft thick are nearly vertical and strike northwest in quartz monzonite. The shear zones have minor amounts of brecciated quartz veinlets, clay gouge, and are iron oxide stained.	Two adits total 320 ft in length, surface workings include several open cuts and two prospect pits.	Nineteen chip and two grab samples were taken; of 16 chip samples of quartz, four contained 0.006 to 0.020 oz gold per ton, five contained 0.4 to 0.7 oz silver per ton, and one contained 6.0 oz silver per ton. Two chip samples of shear zone contained 0.016 and 1.344 oz gold per ton, and one contained 0.8 oz silver per ton. One grab sample of quartz contained 0.228 oz gold per ton.

Table 2.--Mines, prospects, and mineralized areas in the Black Canyon and Blanco Mountain Roadless Areas--Continued

Map No.	Name (commodity)	Summary	Workings and production	Sample data and resources
Black Canyon Roadless Area--Continued				
11	Curiosity prospect (gold)	An iron oxide vein 2.5 ft thick strikes N. 75° E. and dips 70° NW. in limestone.	One shaft over 100 ft deep and one small prospect pit are on the vein.	One chip sample and one grab sample of iron oxides contained no significant metal values.
12*	North Star prospect (gold, silver)	Two fissure-filling quartz veins pinch and swell to a maximum thickness of 5 ft within shear zones in quartz monzonite. One vein strikes N. 35° E., dips 45° to 75° SE.; the other strikes N. 65° E. and dips 70° to 85° NW. They are moderately iron oxide stained, generally fractured, and locally mylonized.	Four adits totalling 525 ft long explore the property.	Twenty-four chip samples were taken of quartz and shear zones and one select sample of quartz was collected. The later contained 0.036 oz gold per ton and three chip samples of quartz contained 27.4, 4.7, and 1.7 oz silver per ton.
13*	Little Gem mine (gold)	A 0.5 ft thick quartz vein strikes N. 45° W. and dips about 25° NE in quartz monzonite. The vein is fractured, heavily iron oxide- and copper-stained, and in places is composed of 50 to 60 percent iron oxides.	The adit has three levels connected by a winze. There are over 700 ft of workings. Four other adits are caved and a line of pits and trenches explore the vein along the surface. Between 1891 and 1896, 162 oz of gold were shipped from the property.	About 3,600 tons of subeconomic resources averaging 1.2 oz gold per ton are estimated to be on the property. Potential for additional gold resources is moderate.
14*	Mirage-Mariposa mine (tungsten, gold silver)	A contact metamorphic tactite body lies along an east-trending contact between quartz monzonite and limestone exposed for 500 ft. The tactite is composed of garnet, pyroxene, epidote, and calcite with minor amounts of pyrite, scheelite, and molybdenite. The tactite body is irregular and fingers out into the limestone. Several randomly oriented quartz veins up to 45 ft thick occur in the quartz monzonite.	A glory hole from which about 20,000 tons of material was removed and a 20 ft and a 45 ft adit driven along the quartz monzonite-limestone contact are present on the property. In 1916, 79 tons of ore yielded 160.4 oz gold and 170 oz silver. Several thousand tons of tungsten ore were mined between 1952 and 1957.	About 55,000 tons of subeconomic tungsten resources with an average grade of 0.15 percent tungsten trioxide are present on the property. Potential for additional tungsten resources is moderate. About 160 tons with 0.34 oz silver per ton are present in the quartz veins.
15	Gray Eagle mine (gold, silver)	East-striking quartz veins dip 35° N. along the contact of quartz monzonite and interbedded argillite and hornfels. Quartz veins contain pyrite, chalcocopyrite, are vuggy, and have iron oxide and copper stains along fractures; veins are up to 3 ft thick and average about 2 ft in thickness. In places iron oxides comprise 75 percent of the vein.	Workings consist of three adits: one is caved and the other two aggregate 400 ft of development. In 1912, ore from the Gray Eagle mine was combined with ore from the Golden Mirage and Little Gem (X-Ray) mine. From 1933 to 1940, 11 tons of ore, containing 38.6 oz gold, 21 oz silver, and 33 lb of copper, was produced.	About 4,700 tons of vein quartz averages 1.3 oz silver per ton and 0.026 oz gold per ton. Potential for silver-gold resources is high.
16	Gray Eagle No. 2 prospect (gold)	A 2-ft-thick east-trending shear zone dipping 35° to 55° N. occurs in limestone and hornfels.	One adit is 60 ft long.	Five chip samples of hornfels contained no gold or silver. One sample of hornfels contained 0.2 oz silver per ton.
17	Gray Eagle No. 3 prospect (gold)	Quartz veins 1 to 2 ft thick striking north, dipping 50° to 60° W. occur in quartz monzonite.	One 15-ft-long inclined shaft and three prospect pits explore the veins.	One grab and two chip samples of quartz were collected; the grab sample contained 9.5 oz silver per ton; one chip sample contained 0.9 oz silver per ton.
18	Golden Star prospect (gold)	A pod of iron oxide occurs in limestone that strikes N. 5° E. and dips 85° NW.	There are two prospect pits: one 5 by 6 ft, the other 3 by 3 ft.	One chip and one grab sample of iron oxides contained no significant metal values.
19	Sally prospect (gold, silver)	Limonite boxworks with quartz stringers occur in an irregular shear zone that trends northeast across beds of phyllite, quartzite, and limestone.	Prospect workings consist of one adit 25 ft long and five prospect pits.	Of four chip samples of the shear zone, three contained 0.3 to 0.5 oz silver per ton. One grab sample of iron oxide boxwork contained 9.7 oz silver and 0.086 oz gold per ton. Another contained 0.4 oz silver per ton. One chip and one grab sample of quartzite contained no metal values.
20*	Jay prospect (gold, silver, lead)	A siliceous, iron-rich zone 2.0 ft thick strikes N. 70° W. and dips 75° NE. in dolomite. Milky white quartz with traces of galena was found in a small stockpile.	One small pit is located on the property.	One select sample of quartz contained 0.3 oz silver per ton and 0.20 percent lead. One chip sample of shear zone contained 0.014 oz gold per ton.

Table 2.--Mines, prospects, and mineralized areas in the Black Canyon and Blanco Mountain Roadless Areas--Continued

Map No.	Name (commodity)	Summary	Workings and production	Sample data and resources
Black Canyon Roadless Area--Continued				
21	Brown Mule prospect (gold, silver)	A 135- by 15-ft vertical pod of milky-white massive quartz trends northwest and dips vertically. Thin-bedded, argillaceous limestone country rock strikes N. 65° W. and dips 60° SW.	One open cut is 15 ft long.	Of four chip samples of quartz, one contained 3.3 oz silver per ton, and another contained 0.078 oz gold per ton.
22	Buster prospect (gold, silver)	A siliceous, iron oxide-rich vein up to 2.5 ft thick strikes N. 50° W. and dips 17° SW. in limestone. The vein is very hard and contains small pods of specular hematite.	One shaft 35 ft deep and three small prospect pits explore vein.	Three chip and one grab sample of the iron oxide-rich vein contained trace to 0.110 oz gold per ton and two contained 1.0 and 6.4 oz silver per ton.
23	Chalcedony prospect (gold)	A shear zone strikes N. 70° W. to west and dips vertically in medium-bedded dolomite. Thin veinlets of calcite are within the shear zone.	One adit is 57 ft long.	Four chip samples of shear zone contained no significant metal values.
24	Jody-Dee-Tom prospect (gold)	A shear zone in dolomite strikes N. 80° E., dips 50° NW., and is up to 2 ft thick.	Workings consist of one inclined shaft 12 ft deep and one small prospect pit.	Two chip samples of shear zone and one chip sample of dolomite contained no metal values.
25	Carol J mine (gold, silver copper, lead)	Interbedded limestone, quartzite, and slate strike east, dips 30° S., and contain numerous quartz veins and pods. The veins are discontinuous, up to 10 ft thick, and strike N. 50° to 70° W. and dip northerly.	Property development consists of one 540-ft-long adit, three shafts (all collapsed), and 12 prospect pits. Bureau of Mines records show that 2,696 tons of ore, yielded 124.63 oz gold, 15,706 oz silver, 2,592 lb copper, 220,744 lb lead, and 20 lb zinc was produced from 1925 to 1951.	There are about 31,000 tons of subeconomic resources with an average grade of 0.07 oz gold per ton and 3.6 oz silver per ton on the property. Potential for additional gold-silver-lead-copper resources is moderate.
26	Katy prospect (gold, silver, lead)	Three subparallel shear zones in dolomite range in thickness from 5 to 10 ft, strike N. 30° to 50° W. and dip 60° to 80° NE. Within the shear zones are siliceous iron oxide boxworks and numerous quartz veinlets. Argentiferous galena is disseminated in the siliceous iron oxides. The shear zones are traceable for over 300 ft.	A 60-ft-long adit two, 20-ft-long adits, a 20-ft-long open out, and two pits investigated the property.	About 8,800 tons of subeconomic resources with an average grade of 0.01 oz gold per ton, 3.8 oz silver per ton and 1.0 percent lead are present. Potential for gold-silver-lead resources is moderate.
27	Grandview prospect (gold, silver, lead)	Iron oxide zones follow irregular planes in mottled limestone which strikes north and dips 25° to 35° W.	Two caved shafts, one trench, and two small prospect pits are present on the property.	Of seven samples, two chip samples of iron oxides contain no metal values. Of five chip and grab samples of limestone collected; three contained 1.0 to 2.9 oz silver per ton.
28*	Hope mine (silver, lead, zinc)	North striking shear zones dip generally west and occur in massive gray limestone that strikes N. 30° W. and dips 50° to 60° SW. The zone forms irregular lenses in the limestone. At the surface, individual veins of goethite, limonite, and hematite with visible galena are from 1 to 4 ft thick. Heavily oxidized zones up to 40 ft thick are exposed underground.	Workings on the property consist of two adits with 500 ft of drifts, inclined stopes, and winzes. There are three shafts; one is caved, the others are 12 and 22 ft deep. Between 1925 and 1946, 900 tons of high-grade lead-silver ore was shipped. In 1947, 248 tons yielded 6.6 oz silver per ton and 7.7 percent lead.	About 84,000 tons of indicated and inferred subeconomic resources with an average grade of 2.0 silver per ton, 1.0 percent lead, and 2.2 percent zinc are present on the property.
29*	Trinity prospect (Black Canyon mine) (gold, silver)	Siliceous fissure veins and quartz veins up to 4.5 ft wide occur along northwest-trending faults in hornfels and limestone.	Development consists of two shafts, 40 and 25 ft deep, one 50-ft adit, one inaccessible adit, a 60-ft-long open cut, and one small prospect pit.	Five chip samples of quartz contained no significant metal values.
30	Gold Crown prospect (gold)	A 1- to 2-ft-thick iron oxide zone strikes N. 60° W., dips vertically in limestone, and is terminated by a limestone-quartzite contact that strikes N. 10° W. and dips 80° SW.	One shaft 20 ft deep is located on the property.	One chip sample of iron oxides contained no significant metal values.

Table 2.--Mines, prospects, and mineralized areas in the Black Canyon and Blanco Mountain Roadless Areas--Continued

Map No.	Name (commodity)	Summary	Workings and production	Sample data and resources
Black Canyon Roadless Area--Continued				
31	Trinity No. 1 prospect (gold, silver)	A fault trending N. 15° W. and dipping 85° SW. has placed younger quartzite and interbedded limestone on the west in contact with older quartzite and interbedded calcareous sandstone on the east. Lenses of milky quartz are present along the fault. An irregular fissure vein of siliceous limonite boxwork and hematite, from 1.0 to 6.0 ft thick with occurrences of fractured quartz veinlets, is emplaced between overlying limestone and underlying quartzite west of fault.	About 580 ft of drift is accessed by three portals and two connecting 40-ft winzes.	Thirty-two chip samples of iron oxides, quartzite, quartz, and limestone were taken: three samples of iron oxides contained 0.114, 0.118, 0.603 oz gold per ton, one sample of quartz contained 3.6 oz silver per ton. There is low potential for gold-silver resources.
32	Vulcan prospect (gold)	Discontinuous milky-white quartz veins up to 0.5 ft thick strike N. 50° W. and dip vertically in hornfels that strike N. 60° E. and dip 15° NW.	A dump from a possible caved adit and one small prospect pit are present on the property.	Two grab samples of quartz contained no significant metal values.
33	Golden Nugget prospect (gold)	An iron oxide-stained shear zone strikes N. 30° W., dips 48° NE. in limestone that strikes N. 20° W. and dips 55° NE.	One 43 ft-long adit is located on the property.	One chip sample of the shear zone and one random chip sample of limestone contained no significant metal values.
34	<u>Triple Canyon prospect</u> (silver, lead)	A massive milky-white quartz vein, exposed for 75 ft, strikes N. 60° W. and dips vertically in fine-grained massive-bedded dolomite. The quartz vein has minor visible galena, is vuggy, and has minor iron oxide staining along fractures.	Four adits totaling 180 ft of workings and one small pit are on the property.	Approximately 1,200 tons of subeconomic resources with an average grade of 5.4 oz silver per ton and 3.6 percent lead.
35	<u>Hall Extension mine</u> (silver-lead)	A 0.7-ft-thick quartz vein in limestone strikes N. to N. 55° E. and dips 20° SE. The milky-white, fractured quartz vein contains 4-in. blebs of medium-grained galena and is offset by several small faults. A fault which strikes north and dips vertically terminates the quartz vein.	Four adits totaling 180 ft of workings and one small pit are located on the property.	Approximately 1,200 tons of vein quartz average 5.4 oz silver per ton and 3.6 percent lead. Potential for silver-lead resources is low.
36	Lone Chair prospect (lead, zinc)	Fissure filling of specular hematite, limonite, and quartz occur for over 40 ft within a northwest trending shear zone that is up to 5 ft thick in interbedded limestone and phyllite that strike N. 15° W. and dip 40° SW.	A 20-ft-long adit with a 40-ft-deep winze, a 40-ft-long trench, and two prospect pits explore the vein.	Of seven chip and three grab samples, one grab sample of quartz contained 1.98 percent lead and 0.24 percent zinc, and one chip sample of sheared limestone contained 0.39 percent lead.
37	Fay prospect (gold)	A 2.5-ft-thick quartz vein strikes N. 54° E. and is exposed for 8 ft along strike. The quartz vein is massive, iron oxide-stained, and has hematite after pyrite pseudomorphs.	One 8-ft-diameter, 2 ft deep prospect pit is located on the property.	One chip and one grab sample of quartz contained no significant metal values.
38	Crown K prospect (lead)	A 1- to 2.5-ft-thick shear zone strikes N. 10° E., dips vertically to 45° SE. in fine-grained, medium-bedded quartzite and interbedded gray recrystallized limestone. Within the shear zone are numerous quartz veinlets and blebs which range up to 1/2 in. in thickness and contain fine-grained galena and pyrite.	Two inclined shafts 75 ft and 12 ft deep and a 45-ft-long adit follow 300 ft of shear zone.	Eight chip samples and two grab samples of quartz, quartzite, and limestone were taken. One grab sample of quartz contains 0.2 oz silver per ton and nine samples average 0.25 percent lead.
39*	<u>Black Beauty prospect</u> (gold, silver, lead)	Country rock is composed of interbedded limestone and phyllite striking north with near-vertical dips. Two north striking, steeply-dipping veins occur as fissure-filled zones of friable iron oxides and quartz 5 in. to 3 ft thick with interbedded veinlets of galena up to 1.5 in. thick. North striking faults dipping 55° to 85° W. truncate the veins downdip.	Two adits totaling 340 ft long and one inlined shaft 45 ft deep are located on the property.	About 1,700 tons of indicated and inferred subeconomic resources with an average grade of 0.18 oz gold per ton and 1.2 percent lead are estimated. Some shoots have more than 4.0 oz silver per ton and 25 percent lead. Potential for gold-silver-lead resources is moderate.
40*	Quartz Lo prospect (gold)	Quartz pods up to 1.0 by 5.0 ft occur in phyllite that strikes N. 10° W. and dips 35° SW.	One prospect pit explores one pod.	One grab sample of quartz contained no significant metal value.
41	Westgard prospect (lead)	A silicified, heavily iron oxide-stained zone up to 3.0 ft thick strikes N. 45° E. and dips 30° to 60° SE. in limestone.	One adit 32 ft long and a 10- by 15-ft prospect pit are located on the property.	Of three chip samples of silicified limestone, two contained 0.81 and 1.7 percent lead.
42	Della B prospect (silver)	A shear zone strikes N. 30° E., and dips 45° SE. in limestone that strikes N. 35° E. and dips vertically.	One shaft 10 ft deep and two small pits explore the property.	Two chip samples of the shear zone contained 0.7 and 0.3 oz silver per ton. Two chip samples of the limestone contained 0.3 and 0.4 oz silver per ton.

Table 2.--Mines, prospects, and mineralized areas in the Black Canyon and Blanco Mountain Roadless Areas--Continued

Map No.	Name (commodity)	Summary	Workings and production	Sample data and resources
Blanco Mountain Roadless Area				
43	Blizzard extension prospect (gold)	Fracture zones in a north-trending dolomite-granite contact contain irregular, small quartz veins with local concentrations of hematite and limonite.	A 28-ft-long adit, two caved adits, and two pits explore the property.	Two chip samples contained 0.3 and 0.5 oz silver per ton. Two of the five select samples had as much as 0.452 oz gold per ton and 2.6 oz silver per ton.
44	Eclipse prospect (silver, lead, zinc)	Fractured argillite is dissected by several quartz veins and veinlets with cellular siliceous limonite lenses up to 7 in. thick and 1 ft long. Quartz has isolated concentrations of galena and pyrite.	One trench is located in argillite.	Two chip and three grab samples were collected. Grab samples had as much as 0.4 oz silver per ton, 0.44 percent lead, and 0.32 percent zinc.
45	Favor No. 1 prospect (gold)	Hydrothermally altered, limonite-filled zone along contact between phyllite and limestone striking N. 16° E. and dips 50° NW.	Two pits are present on a phyllite-limestone contact.	Two grab samples were taken, one from the limonite-filled zone, one from phyllite with quartz fragments. The highest assay value in the zone was 0.01 oz gold per ton.
46	Hidden Treasure prospect (gold, silver, lead, zinc)	Heavily iron-stained bluish quartz vein with euhedral quartz crystals strikes N. 80° E. and dips 85° SE. Country rock is a fractured, thin-bedded, phyllitic hornfels striking N. 25° E. and dipping 65° NW. with fracture fillings of pyrite, arsenopyrite, and galena up to 3 in. wide. Mineralized fractures are not traceable beyond pit limits.	One pit is located in hornfels.	Quartz vein samples had as much as 0.17 percent lead and 0.11 percent zinc. A chip sample of the country rock had 0.014 oz gold and 3.0 oz silver per ton, 2.83 percent lead, and 9.2 percent arsenic. The zinc value from a grab sample was 0.19 percent.
47	Insulation prospect (gold)	A 1- to 2-ft-thick quartz vein strikes N. 26° E. and dips 71° SE. in interbedded argillite and limestone.	Workings consists of two pits.	Two chip and two grab samples contained no significant metal values.
48	S and S Nos. 1-8 prospect (silver, lead)	Limestone with phyllite interbeds strikes N. 6°-16° E., dips 72°-87° SE., and includes a network of small, irregular quartz veins. Quartz has isolated concentrations of disseminated galena and pyrite.	A bulldozer cut, a trench, a pit, and an 18-ft-long adit are located on the property.	Seventeen chip and seven grab samples were taken. Samples contained as much as 5.5 oz silver per ton, 4 percent lead, and 0.16 percent tungsten trioxide, but most had considerably less.
49	Unknown prospect (7, 6, 36) ¹	A 1.8- to 3.4-ft-thick quartz vein 65 ft long and an irregular quartz pod about 10 ft wide and 20 ft long occur in granite. Areas of the pod are brecciated and rehealed with brown jasper. A small xenolith of argillaceous limestone borders the pod and thin, undefined exposures of garnet-epidote skarn border portions of the quartz vein. Vuggy portions of the brecciated quartz contain euhedral quartz crystals, pyrite, and galena cubes. Several areas also have very light malaohite staining.	Workings consist of three trenches; the largest is 30 ft long.	Seven samples were collected. A random grab and three chip samples across the quartz vein had no significant metal values, but a select sample from a 2-ton stockpile had 0.02 oz gold per ton, 0.6 oz silver per ton, 0.02 percent copper, 0.16 percent lead, and 0.10 percent zinc. A random chip sample from the quartz pod contained 2.5 oz silver per ton, 0.03 percent copper, and 0.06 percent lead.
50	Blue Bird Nos. 1-2 prospect (gold, placer)	Remnant Tertiary gravels composed of quartzite, dacite, gabbro, and granite clasts occur over a 4,000 ft by 1,000 ft area. Thickness varies from a few feet to about 300 ft.	Workings consist of 13 trenches and pits, and two caved adits	Eleven grab samples were collected; none had recoverable gold.
51	Old Gold prospect (gold)	Deposit consists of limonite stained argillite.	One pit is located in argillite.	One grab sample was collected; there is no detectable gold or silver.
52	White Cloud prospect (lead, zinc)	Light-gray marbleized limestone and pale green-gray phyllite strike N. 15°-30° W. and dip 60° SW. A shear zone 1.0 to 1.5 ft wide is partly traceable for 100 ft. It consists of altered country rocks, siliceous limonite, gray chert, vein quartz, and hematite. The zone ranges from brecciated to vuggy and cellular. Highly oxidized blebs of galena and intergrown sphalerite are disseminated in the quartz.	Workings consist of two pits: the largest is 30 ft long and 12 ft wide.	Three chip samples taken across the shear zone contained from 0.03 to 0.88 percent lead and from 0.42 to 0.64 percent zinc. Three stockpiles totaling about 5 tons were sampled. The two grab samples had 6.90 and 1.42 percent lead and 0.56 and 0.88 percent zinc, respectively.
53	Unknown prospect (2, 6, 35) ¹	Argillite, sandstone, and interbedded limestone strike N. 16° to 45° E. and dip 63° NW. Three small lenses or pods of hydrothermally-altered, iron-rich resillified sediments contained oxidized galena. The largest pod is 4.3 ft long and 3 ft wide.	Three pits explore the property.	A chip sample from each pod and a random grab from each dump was taken. Two chip samples had 3.31 and 5.90 percent lead. A sample from a 1-ton stockpile located near the highest-grade pod had 9.60 percent lead. One chip sample also contained 0.4 percent zinc.

¹Numbers in parenthesis refer to township, range, and section, according to the Mount Diablo Meridian.

*Properties located near, but outside the roadless area.

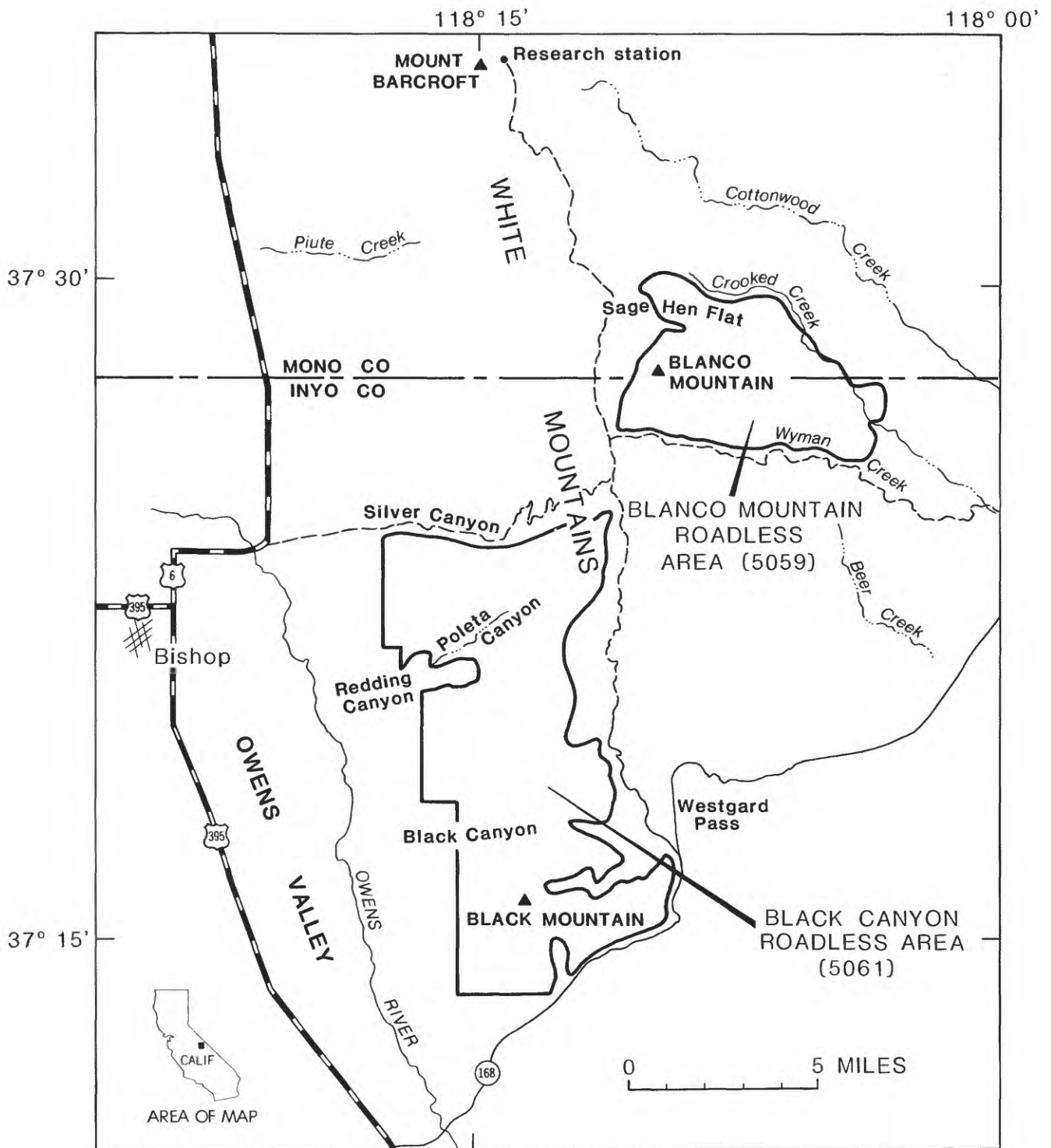


Figure 1.--Index map showing locations of the Blanco Mountain (5059) and Black Canyon (5061) Roadless Areas in Inyo National Forest, Inyo and Mono Counties, California.

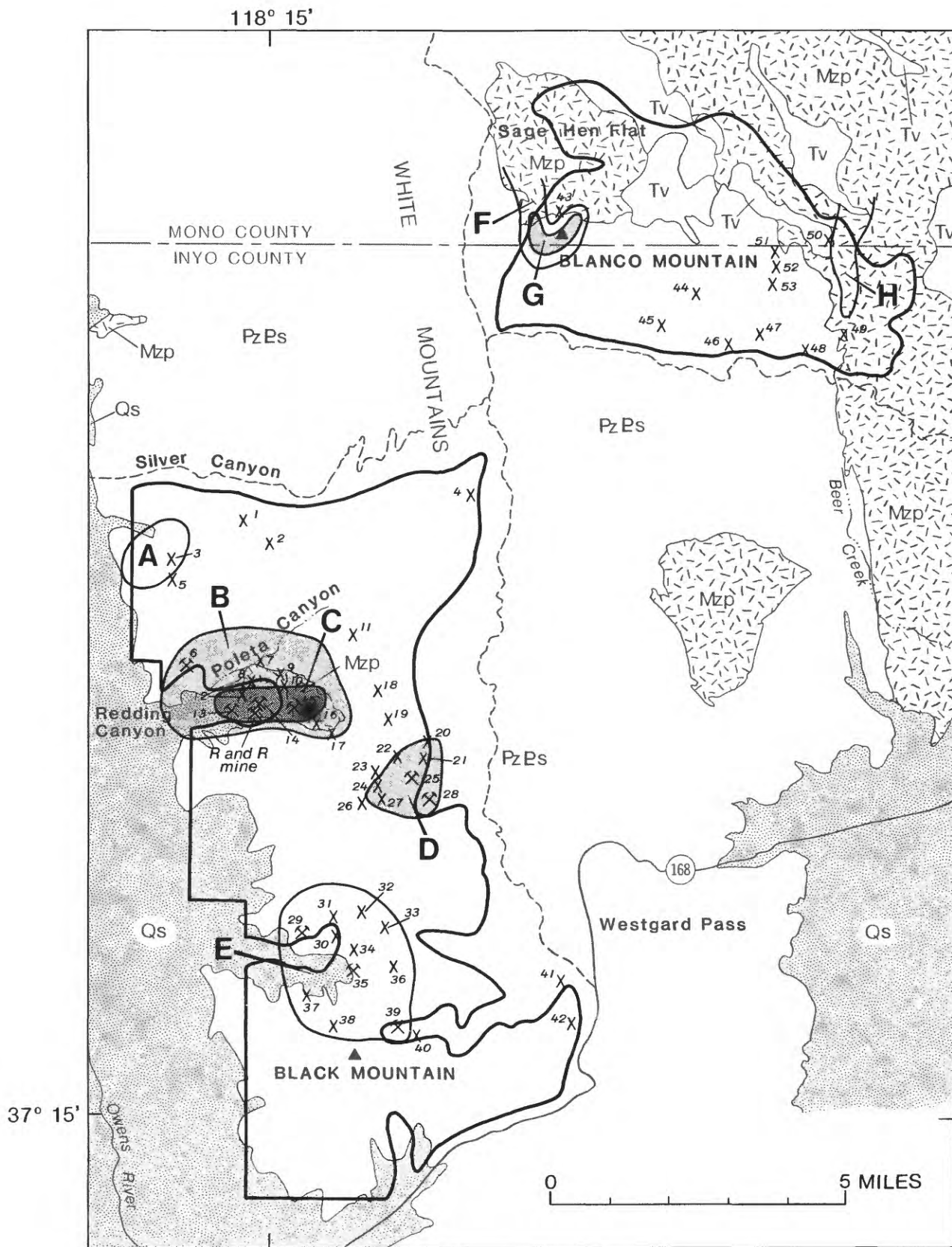





Figure 2.--Map showing generalized geology, mines and prospects, and areas of mineral resource potential in the Blanco Mountain and Black Canyon Roadless Areas, California (see explanation on following page).

EXPLANATION

Areas with mineral resource potential--Labeled A - H

- A  Area of low potential
- D  Area of moderate potential
- C  Area of high potential


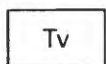
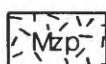
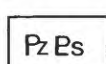
⁴²X Prospect--Number refers to table 2

¹⁴X Mines with production record--Number refers to table 2

— Approximate boundary of roadless areas

----- Secondary roads

DESCRIPTION OF MAP UNITS

-  Surficial deposits (Quaternary)
-  Volcanic rocks (Tertiary)
-  Plutonic rocks (Mesozoic)
-  Sedimentary rocks (Paleozoic and Proterozoic)

