MINERAL RESOURCE POTENTIAL OF THE PLEASANT VIEW ROADLESS AREA, LOS ANGELES COUNTY, CALIFORNIA

SUMMARY REPORT

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STUDIES RELATED TO WILDERNESS

Under the provisions of the Wilderness Act (Public Law 88-577, September 3, 1964) and the Joint Conference Report on Senate Bill 4, 88th Congress, 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 submitted to the President and the Congress. This report discusses the results of a mineral survey of the Pleasant View Roadless Area (5008), Angeles National Forest, Los Angeles County, California. The area was originally classified as nonwilderness during the Second Roadless Area Review and Evaluation (RARE II) by the U. S. Forest Service, January 1979, but was reclassified as a further planning area during April 1978.

SUMMARY

A mineral resource survey of the Pleasant View Roadless Area included geologic mapping, a geochemical survey of rocks and stream sediments, and a study of mines, prospects, and mineralized areas. There are no known mineral deposits and there is no evidence of past mineral production from the study area. Although gold has been produced 2 mi southeast of the study area and minor amounts of gold were detected in samples of vein quartz from one prospect in the study area, gold was not detected by the geochemical survey of stream sediments. This limited evidence suggests that the entire study area has low potential for gold resources. Stream-sediment samples slightly enriched in tungsten and containing grains of the tungsten mineral scheelite cluster in an 8.5-mi² zone at the east end of the study area. However, evidence of tungsten mineralization was not observed in the crystalline rocks exposed within this zone. Judging from the small amounts of tungsten detected in the stream sediments, from the lack of historical tungsten mining or other conclusive evidence of tungsten mineralization in the study area, and from the limited scale of tungsten mineralization in neighboring areas, any bedrock or placer concentrations of tungsten that may be present in the study area probably are small and (or) low grade. Thus, there is low to moderate potential for tungsten resources within the designated 8.5-mi² zone at the east end of the study area. Evidence of resource potential was not observed for any mineral other than gold and tungsten.

INTRODUCTION

Geographic setting

The Pleasant View Roadless Area is located on the north slope of the San Gabriel Mountains (fig. 1) directly south of the western Mojave Desert region and approximately 25 mi northeast of Los Angeles, Calif. The study area encompasses 26,700 acres of rugged mountainous terrain in the Angeles National Forest. Elevations in the study area range from nearly 4,000 ft on Little Rock Creek at the west end of the area, to approximately 8,400 ft at Mount Lewis near the east end of the area. Pleasant View Ridge, which includes several summit elevations near 8,600 ft, trends northwestward across the western half of the study area and forms the drainage divide between Little Rock and Big Rock Creeks. Angeles Crest Highway (State Highway 2) skirts the south boundary of the study area, providing access to neighboring ski resorts on Waterman Mountain and Kratka Ridge. Two foot trails cross the study area, connecting Angeles Crest Highway with campgrounds near Big Rock Creek.

Geologic setting

The study area lies in the northern San Gabriel Mountains south of the San Andreas and Punchbowl faults (fig. 2). Ehlig (1981) has summarized the geology of the San Gabriel Mountains. Published geologic maps by Noble (1954), Dibblee (1967), Berrows (1980), and Evans (1982a,c) cover parts of the study area, and unpublished mapping within the study area and vicinity by T. W. Dibblee and by P. L. Ehlig has been incorporated in the geologic map of the San Bernardino 1° by 2° quadrangle (Rogers, 1967). Cox and Powell (unpub. map, U. S. Geological Survey, Menlo Park, 1982) mapped the study area to provide data for the present report; a simplified version of their geologic mapping is shown on figure 2 and on the accompanying mineral resource potential map. Crystaline bedrock is exposed throughout most of the study area. The main bedrock units include Precambrian gneiss, several assemblages of late Paleozoic(? ) and Mesozoic plutonic rocks, and poorly dated schist and mica schist rocks. Gneiss units locally present in the study area consist of Tertiary sedimentary rocks, Tertiary rhyolite, and Quaternary alluvial deposits. The crystalline bedrock and Tertiary rock units are cut by numerous minor faults and by three regionally prominent structures: the Vincent thrust, and the Fenner and Punchbowl faults.

Precambrian gneiss

The oldest rocks in the study area are amphibolite-facies gneissic rocks that form scattered remnants intruded
Late Paleozoic(?) and Mesozoic plutonic rocks

The gneissic rocks of the study area are intruded by numerous plutonic rock units (plutonic rock terminology used herein follows Streekeisen, 1973). The oldest plutonic unit consists of mafic diorite and gabбро of probable Late Permian or Triassic age. These mafic rocks are intruded by a unit of foliated quartz monzodiorite and quartz diorite; the body of late Paleozoic(? and Mesozoic plutonic rocks consists of quartz diorite, tonalite, and granodiorite; and a unit of leucocratic biotite monzogranite that intrudes the other two younger plutonic units. On the basis of regional geologic relations, we assign a Jurassic(?) age to the quartz monzodiorite unit and a Cretaceous age to both the heterogeneous plutonic rocks unit and the monzogranite unit.

Two additional plutonic rock units are exposed north of the Punchbowl fault. The Pinyon Ridge Granodiorite (Noble, 1954) crops out north of the Fenner fault. This unit consists of porphyritic quartz monzodiorite, which locally contains heterogeneous plutonic rocks consisting of quartz diorite, tonalite, and granodiorite; and a unit of leucocratic biotite monzogranite that intrudes the other two younger plutonic units. On the basis of regional geologic relations, we assign a Jurassic(?) age to the quartz monzodiorite unit and a Cretaceous age to both the heterogeneous plutonic rocks unit and the monzogranite unit.

Schist and mylonite rocks

Schist and mylonite rocks are exposed near the east end of the study area. The Pelona Schist (Hershey, 1962) consists of green-schist-facies metamorphic rocks derived from sandstone, siltstone, shale, basalt, and chert (Ehlig, 1981; Evans, 1982a). Exposures of the schist are present between the Big Rock Creek and Fenner faults (Noble, 1954) and southeast of the study area, structurally beneath the Vincent thrust fault (Evans, 1982a). Precambrian gneiss and late Paleozoic(?) and Mesozoic plutonic rocks that structurally overlie the Pelona Schist in the upper plate of the thrust are mylonitized in a thick zone adjacent to the thrust surface. Rubidium-strontium ages from the Pelona Schist and structurally overlying mylonite rocks suggest that both rock units were metamorphosed and deformed during and (or) before Paleocene time (Ehlig, 1981, Evans, 1982c); however, the depositional age of the Pelona Schist protolith is uncertain.

Cenozoic units

Tertiary sedimentary rocks nonconformably overlie crystalline rocks north of the Punchbowl fault. These sedi-
Vincent thrust westward into the study area as far as the drainage divide west of the South Fork of Big Rock Creek. This zone of fractured and foliated rocks could have provided an access route for mineralizing fluids that may have originated near the Vincent thrust. This idea is supported by the geochemical survey (following section), which detected anomalously high concentrations of one or more trace elements in stream sediments derived from the zone of deformed rocks; however, gold was not detected by the survey.

Geochemistry

A reconnaissance geochemical survey of stream sediments and crystalline bedrock was conducted for 31 major, minor, and trace elements to identify any spatial variations in chemistry that might reflect local concentrations of ore minerals. Emission-spectrographic analyses were performed on stream-sediment samples collected at 57 sites and on samples of nonmineralized bedrock collected at 62 sites. The stream sediments were the main target of the survey. Stream-sediment geochemistry provides useful information for reconnaissance mineral resource evaluation because anomalously high concentrations of a specific element or group of elements in alluvium can indicate the presence of mineralized bedrock upstream in the drainage basin.

Sandy alluvium was collected from all the main drainages in the study area. Each stream-sediment sample was processed to yield two fractions for spectrographic analysis: (1) a minus-80-mesh fraction and (2) a nonmagnetic heavy-mineral concentrate produced by hand panning in the field followed by bromoform immersion and electromagnetic separation in the lab. A split of each heavy-mineral concentrate was also examined microscopically to determine the mineralogy of the heavy-mineral grains. The bedrock samples were collected from visibly unweathered, nonmineralized outcrops. Twenty determinations were made to determine abundances of elements in crystalline rock units, thereby facilitating interpretation of the stream-sediment geochemistry.

When compared to worldwide-average geochemical abundances (for example, see Turekian, 1977), the compositions determined for most bedrock samples are normal for the rock types involved. However, the analytical data show that the Mount Lowe Granodiorite and the mafic diorite and gabbro unit contain unusually large amounts of strontium (as much as 1000 ppm). These strontium concentrations are anomalous for plutonic rocks, but are not high enough to have any mineral resource significance. The bedrock survey also revealed some minor geochemical variations in the eastern half of the study area that apparently are unrelated to rock type or to mapped faults: minor anomalies were determined for metals and crystalline bedrock was conducted for 31 major, minor, and trace elements. Notable exceptions were found for tungsten, barium, strontium, boron, and bismuth. These anomalies were partly compensated by their pronounced association with geochemical anomalies for strontium, boron, and bismuth.

The occurrence of tungsten anomalies and scheelite at the east end of the study area is noteworthy because vein-related subeconomic resources of scheelite have recently been described in similar geologic settings 10 to 12 mi south of the study area (Ridenour and others, 1984; Zilka and Schmauch, 1982). It should also be noted that the largest amounts of tungsten determined by our geochemical survey (300 ppm in heavy-mineral concentrates) are small compared to tungsten anomalies as great as 2000 ppm and 10,000 ppm that have been reported for panned-concentrate samples collected 6 to 10 mi southeast of the study area (Evans, 1982b). However, the modest magnitudes of the tungsten anomalies are partly compensated by their pronounced clustering in association with the anomalies for barium, bismuth, and bismuth.

MINES, PROSPECTS, AND MINERALIZED AREAS

The Bureau of Mines inspected mines, prospects, and the Pecos Hills area in 1981 and reviewed documents and reports pertaining to historical mining and prospecting activities. U.S. Forest Service and U.S. Bureau of Land Management records were examined to determine claim locations, and field examinations were conducted at all known claims and prospects. There is no active mining and there are no patented claims or mineral leases in the study area. There is no active mining and there are no patented claims or mineral leases in the study area. No known claims or mineral leases are known in the study area. The area contains no known mineral deposits and no evidence of past production of metallic mineral resources, industrial mineral resources, coal, and hydrocarbons, or geothermal energy.

Three prospects are located within or directly adjacent to the study area. The Sycamore prospect (fig. 2, loc. 1), located at the northwest end of the study area, consists of one 37-ft thick and an open cut measuring 13 ft long, 6 ft wide, and 10 ft deep. The prospect explores a zone of ductile shearing along the contact between Jurassic(? quartz monzo-
diomite (unit Jqm) and Cretaceous monzogranite (unit Kmin). A quartz vein in the Mount Lowe Granodiorite of Miller (1926, 1934) and is truncated on the south by a fault. The gneiss is pulverized and brecciated adjacent to the fault but contains no evidence of metallic minerals.

The Fenn Canyon prospec (fig. 2, loc. 9), located just outside the eastern boundary of the study area, contains two caved adits. The workings are in limonite-stained schist that contains no evidence of significant mineralization.

The Inactive Big Horn mine (fig. 2, loc. 4), located 2 mi east of the study area, has been the only mineral producer in the near vicinity (Ridenour and others, 1982). The mine was owned by the Siskon Corporation in 1975. Minerals containing gold, silver, copper, and lead occupy veins within chlorite schist and carbonaceous schist directly beneath the Vincent thrust fault. Ten adits at the mine contain more than 6,100 ft of workings. Bureau of Mines records indicate that the property has produced 31,000 oz gold, 2,430 oz silver, 1,357 Ib copper, and 1,296 Ib lead. According to a 1975 estimate, the mine contains approximately 1.2 million tons of subeconomic mineral resources averaging 0.15 oz gold per ton (Ridenour and others, 1982). At 2.48 oz gold per ton, the mine probably contains at least marginal reserves of gold.

**REFERENCES CITED**


Figure 1.—Index map showing the location of the Pleasant View Roadless Area (5008), Los Angeles County, California.
Figure 2.—Pleasant View Roadless Area, showing simplified geology, mines and prospects, and area with low to moderate potential for vein-related tungsten resources. Geology north of Punchbowl and Fenner faults is modified from Rogers (1967) and Kooser (1980); geology near Vincent thrust southeast of study area is modified from Evans (1982a,c). For detailed description of geologic units see accompanying map sheet. Qs, surficial deposits (Quaternary); Ts, sedimentary rocks (Tertiary); Tr, rhyolite (dike) (Tertiary); Tk, biotite monzogranite near Vincent Gap (Miocene? or Cretaceous?); ps, Pelona Schist (age uncertain); Km, leucocratic biotite monzogranite (Cretaceous); Khp, heterogeneous plutonic rocks (quartz diorite, tonalite, and granodiorite) (Cretaceous); Mrp, Pinyon Ridge Granodiorite (quartz diorite and quartz monzodiorite) (Mesozoic); Jqm, porphyritic quartz monzodiorite (Jurassic?); Rml, Mount Lowe Granodiorite of Miller (1926, 1931) (quartz monzodiorite and quartz diorite) (Triassic); Rpdg, mafic diorite and gabbro (Triassic or Permian); MrpEm, mylonitic rocks (Mesozoic, late Paleozoic?, and Precambrian); pgn, gneissic rocks (Precambrian). In addition, unit gm (not shown on accompanying map sheet) consists of undifferentiated granitic and metamorphic rocks (age uncertain) north of San Andreas fault.

EXPLANATION

AREA WITH LOW TO MODERATE POTENTIAL FOR VEIN-RELATED TUNGSTEN RESOURCES

MINES AND PROSPECTS

X1 Sycamore prospect
X2 Donaldson prospect
X3 Fenner Canyon prospect
X4 Bighorn mine

CONTACT—Dashed where approximate

FAULT—Dashed where approximate; dotted where concealed. Arrows indicate relative lateral movement

THRUST FAULT—Dashed where approximate. Barbs on upper plate

ROADLESS AREA BOUNDARY