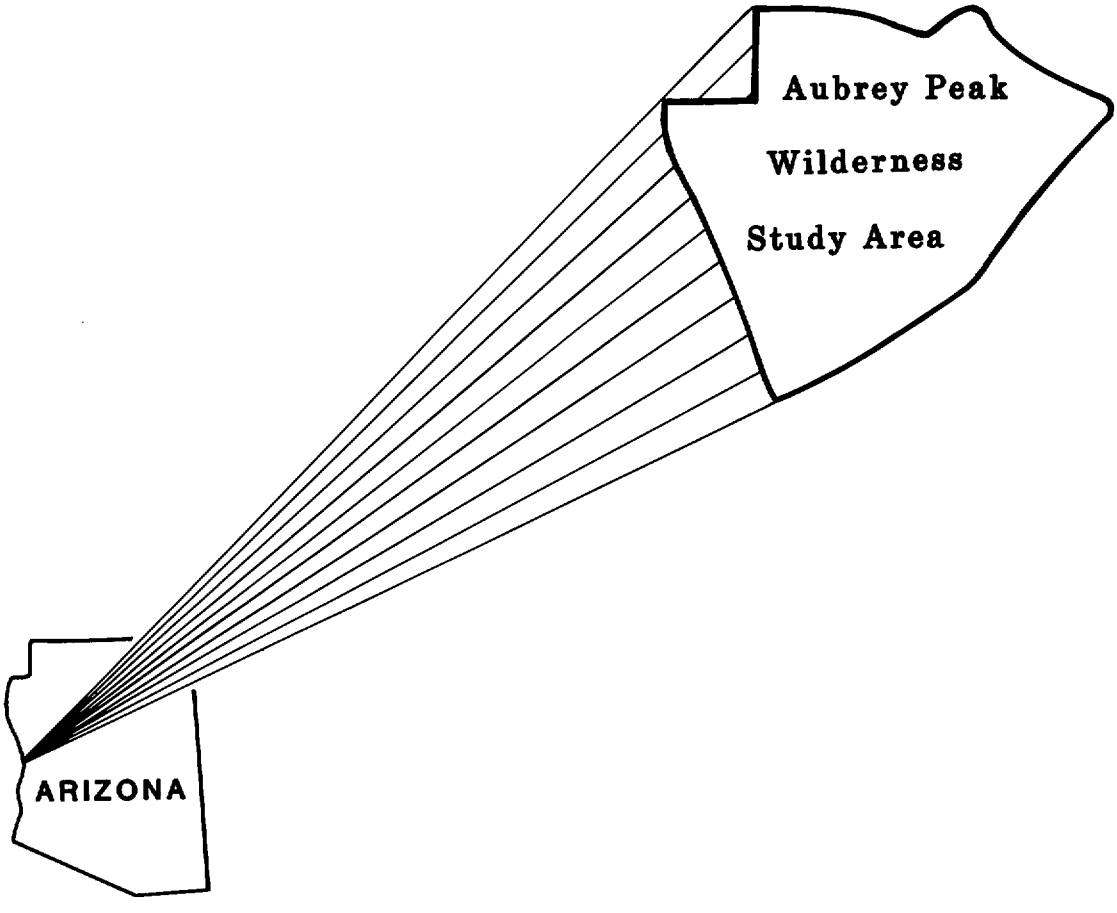
MLA 39-88

Mineral Land Assessment
Open File Report/1988

Mineral Resources of the Aubrey Peak Wilderness Study Area (AZ-020-054), Mohave County, Arizona



BUREAU OF MINES
UNITED STATES DEPARTMENT OF THE INTERIOR

MINERAL RESOURCES OF THE AUBREY PEAK WILDERNESS STUDY AREA (AZ-020-054), MOHAVE COUNTY, ARIZONA

by

Michael E. Lane

MLA 39-88
1988

Intermountain Field Operations Center,
Denver, Colorado

UNITED STATES DEPARTMENT OF THE INTERIOR
Donald P. Hodel, Secretary

BUREAU OF MINES
T S Ary, Director

PREFACE

The Federal Land Policy and Management Act of 1976 (Public Law 94-579) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain 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 mineral survey of the Aubrey Peak Wilderness Study Area (AZ-020-054), Mohave County, Arizona.

This open-file report summarizes the results of a Bureau of Mines wilderness study. The report is preliminary and has not been edited or reviewed for conformity with the Bureau of Mines editorial standards. This study was conducted by personnel from the Resource Evaluation Branch, Intermountain Field Operations Center, P.O. Box 25086, Denver, CO 80225.

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

ft^3/st	cubic feet per short ton
°F	degree Fahrenheit
ft	foot
in.	inch
mi	mile
ppm	part per million
ppb	part per billion
%	percent
lb/ft^3	pound per cubic foot
oz/st	troy ounce per short ton (2,000 pounds)

MINERAL RESOURCES OF THE AUBREY PEAK WILDERNESS STUDY AREA (AZ-020-054), MOHAVE COUNTY, ARIZONA

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Michael E. Lane, Bureau of Mines

SUMMARY

In May 1987 and April 1988 the Bureau of Mines conducted a mineral investigation of the 16,550-acre Aubrey Peak Wilderness Study Area in Mohave County, west-central Arizona. The investigation was requested by the Bureau of Land Management and authorized by the Federal Land Policy and Management Act of 1976 (Public Law 94-579).

Prospecting has taken place in and near the study area, but no mining activity existed at the time of this investigation. Inferred subeconomic silver, gold, and perlite resources are in the study area. Silver resources were calculated for three veins near Keenans Camp: about 4,000 short tons (st) averaging 10.03 ounces per short ton (oz/st), 7,000 st averaging 4.44 oz/st, and 3,000 st averaging 6.02 oz/st. A mineralized fault along Centennial Wash contains a gold resource of about 400 st averaging 0.075 oz/st, and a northwest-striking low-grade perlite deposit of about 15,000,000 st was estimated for an area along Centennial Wash. The perlite is not of commercial grade and is not likely to be developed. Sand and gravel occurs in the study area but their properties are not unique and similar material can be found elsewhere closer to existing markets. The chance for hydrocarbon accumulation is rated by the U.S. Geological Survey as zero to low and there is no known geothermal occurrence near the study area.

INTRODUCTION

In May 1987 and April 1988 the Bureau of Mines, in a cooperative program with the U.S. Geological Survey (USGS), studied the mineral resources of the

16,550-acre Aubrey Peak Wilderness Study Area (WSA), Mohave County, Arizona, on lands administered by the Bureau of Land Management (BLM), Phoenix District Office.

The Bureau surveys and studies mines, prospects, and mineralized areas to appraise reserves and identified mineral resources. The USGS assesses the potential for undiscovered mineral resources based on regional geological, geochemical, and geophysical surveys. This report presents the results of the Bureau of Mines study that was completed prior to the USGS investigation. The USGS will publish the results of their studies. A joint USGS-Bureau report, to be published by the USGS, will integrate and summarize the results of these surveys.

Geographic and geologic setting

The Aubrey Peak Wilderness Study Area (WSA) is in west-central Arizona in southern Mohave County, about 30 mi southeast of Lake Havasu City, Arizona (fig. 1). The study area lies at the south end of the McCracken Mountains and about 8 mi north of the Bill Williams River.

Access is by unimproved roads from the Alamo-Yucca Road. The area is bounded on the west and southeast by a pipeline and powerline road, respectively. An unimproved road is along the north boundary.

Terrain is typical of the southwestern desert and consists of sandy washes and rugged mountains. The highest elevation is 3,132 ft in the western part and the lowest is about 1,600 ft in the southern part of the study area. Vegetation consists mostly of cacti, mesquite, palo verde, and small shrubs. Saguaro cacti are plentiful and picturesque.

The WSA is in the Sonoran Desert section of the Basin and Range physiographic province. Precambrian-age schist and gneiss are intruded by

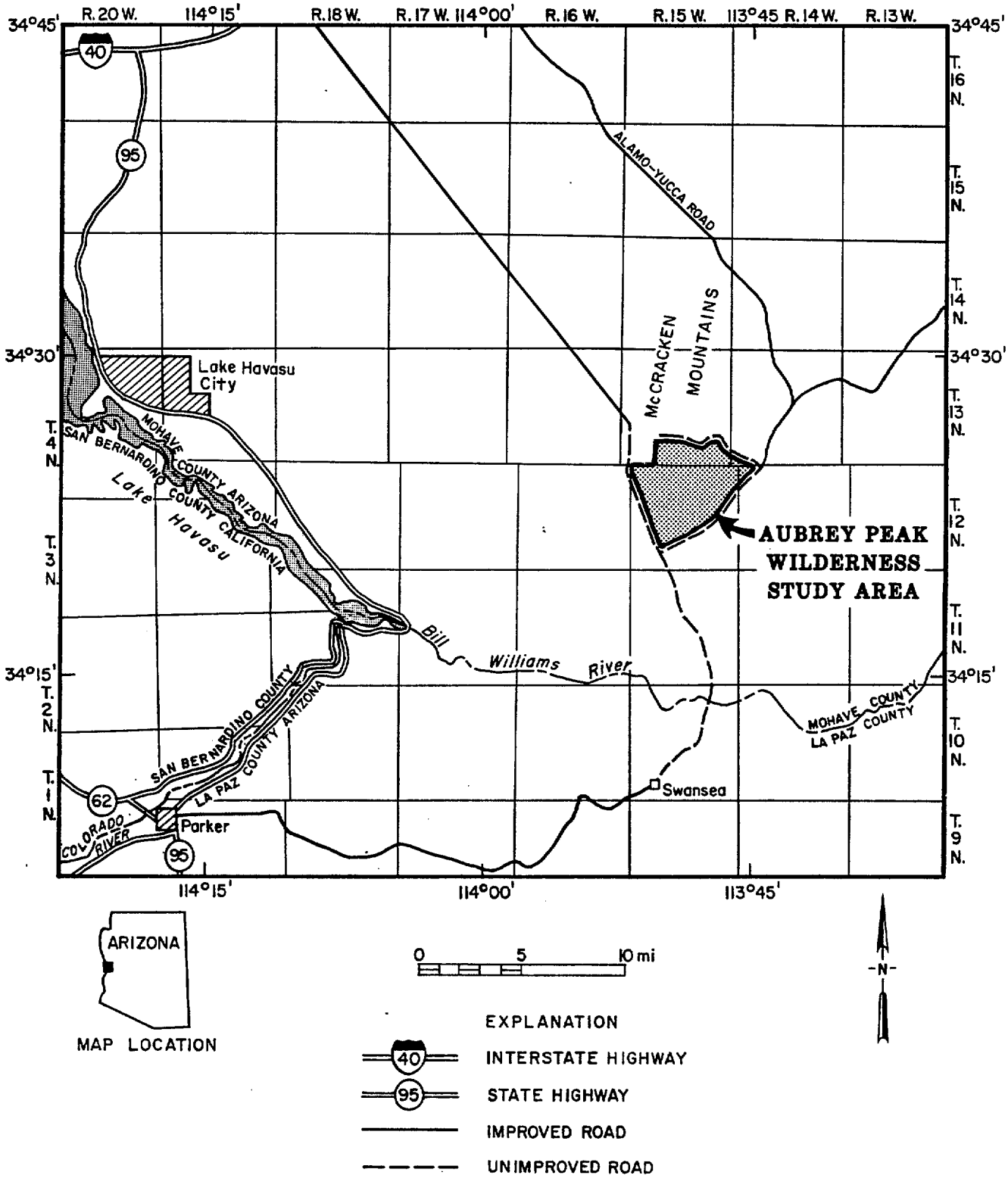

Figure 1.--Index map of the Aubrey Peak Wilderness Study Area, Mohave County, Arizona.

Quaternary basaltic and rhyolitic to andesitic dikes and plugs. Most of the study area is underlain by Tertiary-age rhyolite as tuff and agglomerate. Much of the southern part of the area is covered by Quaternary alluvium. Argentiferous veins containing quartz, calcite, and barite are found in volcanic breccia in the southeastern part of the study area near Keenans Camp (Arizona Department of Geology and Mineral Technology, 1959, unpublished file data). Perlite crops out in the WSA, and may be associated with recent lava flows of Eocene and Oligocene age (Meisinger, 1979, p. 6).

Previous investigations

Bancroft (1911) studied ore deposits in northern Yuma County and included the McCracken Mine, which is about 1 1/2 mi north of the WSA. The geology of the study area is included in the Mohave County geologic map by Wilson and Moore (1959).

Method of investigation

Bureau personnel reviewed literature concerning mining and geology of the region. In addition, BLM records were reviewed for mining claim information and oil and gas leases and lease applications, which are shown on plate 1.

Two geologists spent 10 days conducting a field examination in and within one mile of the study area. Surface and accessible underground workings were surveyed by compass and tape, mapped, and sampled. Figures 2-6 show maps of workings and sample data. Table 1 shows data for samples taken at workings not shown on the figures and table 2 shows data for five perlite samples taken in the WSA.

A total of 77 samples was taken during the field examination; 62 samples were from within the study area and the rest were from within 1/2 mi of the boundary (pl. 1). Chip samples were taken at workings or perlite outcrops and

grab samples were taken of dump material. All but the perlite samples were analyzed for a suite of 34 elements, including gold and silver, by neutron activation. In addition, 6 samples were analyzed for gold by fire assay, 6 samples for zinc and 1 sample for manganese by acid digestion and atomic absorption method, 35 samples for barium by X-ray and gravimetry, and 7 samples for fluorine by distillation. All analyses, with the exception of the perlite samples, were done by Bondar-Clegg and Company, Ltd., Denver, CO. Perlite samples were analyzed for characteristics for industrial use by The Perlite Corporation, Chester, PA. Sample data are summarized in tables 1 and 2 and figures 2-6. Complete analytical data for all samples are available for public inspection at the Bureau of Mines, Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO.

MINING HISTORY

No production records were found for the study area and there are no patented claims in the study area. Three blocks of unpatented claims are in and along the southeast boundary (pl. 1). Less than half of the WSA is covered by oil and gas leases (pl. 1). No oil and gas drilling has taken place in the WSA.

The McCracken Mine, in the McCracken mining district about 1 1/2 mi north of the study area, is a lead-silver mine that was discovered in 1874 (Arizona Bureau of Geology and Mineral Technology, unpublished file data). The ore at the mine is found in four prominent north-striking veins 6 to 30 ft wide and at least 750 ft deep (Arizona Bureau of Geology and Mineral Technology, unpublished file data). One vein was reported by Bancroft (1911, p. 125) to extend 2 mi south of McCracken Mountain but Bureau personnel could not trace these structures beyond the mine area because of alluvial cover. No structures were seen during an aerial reconnaissance.

Lead and silver production started in 1875 and was intermittent until September 1985 when the mine shut down due to low silver prices. Between 1911 and 1981, the McCracken district produced 10,000 lb copper, 3,031,000 lb lead, 43,000 lb zinc, 100 lb molybdenum, 100 oz gold, and 699,000 oz silver (Keith and others, 1983, p. 36-37). In 1980, the McCracken Mine produced about 60,000 tons of ore averaging 3.5 oz/st silver and from January 1984 to September 1984, about 30,000 tons of ore averaging 12 oz/st silver was produced (Corwin Coe, Arizona Silver Corporation, 1987, oral commun.).

The Castenada mining district is adjacent to the west boundary but no workings were found in or near the WSA. The district has produced minor manganese that was hand picked from float material from the Artillery Formation (Farnham and Stewart, 1958, p. 53).

The Owens and Mesa districts are about 6 mi south of the WSA. The Owens district produced 63,000 lb lead, 100 oz gold, 10,000 oz silver, and 3,000 lb copper from fissure veins in schistose diorite and pegmatite. The Mesa district produced between 40,000 and 80,000 tons of manganese ore from fractures in Paleozoic limestone and bedded deposits in Tertiary sandstone (Farnham and Stewart, 1958, p. 52).

ENERGY RESOURCES

The study area is covered, in part, by oil and gas leases (pl. 1); however, there has been no drilling within the boundary. Ryder (1983) rated the WSA as having zero to low potential for the occurrence of oil and gas based on the extensive occurrences of Precambrian schist and gneiss. A large part of the WSA is underlain by these rocks, which are not conducive to the formation and accumulation of hydrocarbons.

No geothermal leases are in or near the study area. No thermal springs, wells, or known geothermal resource areas are near the WSA (Witcher and others, 1982).

APPRAISAL OF SITES EXAMINED

Thirty-three pits, four short adits, and one small shaft inside the WSA were sampled (pl. 1); in addition, four pits and three short adits within 1 mi of the boundary were examined. Most of the workings are concentrated near Keenans Camp and Centennial Wash along the southeast boundary; three were found near the northeast boundary.

Veins sampled in the study area are similar in mineralogy to those in the McCracken Mine. They contain quartz, barite, calcite, and minor fluorite. The veins in the study area are not traceable for any significant distance and it is not known if there is a direct relationship between the two vein systems.

Gold

Samples 47-66 were taken in the WSA at a cluster of workings along Centennial Wash. Gold was detected in fault and vein material in volcanic breccia, conglomerate, schist, diabase, and altered granite (table 1; fig. 6). The veins contain quartz, barite, calcite and minor fluorite. The gold content was between 5 ppb and 0.38 oz/st; 13 samples contained gold in excess of 0.01 oz/st. The mineralized structures could not be traced any significant distance from the workings. An inferred subeconomic gold resource of about 400 st of material averaging 0.075 oz/st was calculated for the fault shown on figure 6. Figures used in the calculations were: an assumed length of 47 ft, width of 25 ft, average sample width of 3.74 ft, and a tonnage factor of 12 ft^3/st.

Minor gold (0.01 oz/st) was also found in samples 69 and 71 but no resources could be calculated because of the limited exposure of the

structures. Subsurface sampling would be needed to determine if the gold continues at depth.

Silver

Samples 18-42 were taken in the study area at workings near Keenans Camp. Silver occurs in veins in volcanic breccia; the veins are composed of calcite, barite, and minor quartz and hematite. The silver content of the samples was between 5 ppm and 18.6 oz/st; 15 of the samples contained silver in excess of 2 oz/st.

Three areas contain inferred subeconomic silver resources. The structure length and sample width was changed for each calculation. For workings where samples 26-29 were taken, 4,000 st averaging 10.03 oz/st silver was calculated using a length of 265 ft, a width of 50 ft, and an average sample width of 3.65 ft. About 7,000 st averaging 4.44 oz/st was calculated for samples 31-34 by using a length of 347 ft, a width of 50 ft, and an average sample width of 4.67 ft. About 3,000 st averaging 6.02 oz/st was calculated for samples 35-40 using a length of 247 ft, a width of 50 ft, and an average sample width of 3.30 ft. A tonnage factor of 12 ft^3/st was used for all resource calculations. The vein where samples 35-40 were taken could not be traced north of the shaft (sample 40). Samples 41 and 42, which were not on the same structure as samples 35-40, contained silver (5.3 and 18.6 oz/st, respectively) but no resources were calculated because the structure was not continuous. Barite in the vein was poor in quality and would not be considered a resource.

Perlite

Five perlite samples (30, 43-46) were taken in the WSA from two perlite outcrops. The larger outcrop was traceable for about 8,500 ft and estimated

to be about 700 ft wide. The smaller outcrop was estimated to be 4,700 ft long and about 200 ft wide. Perlite in both outcrops was about 30 ft thick.

Perlite is a glassy volcanic rock, rhyolitic in composition, contains 2% to 5% combined water, and expands 4 to 20 times its original volume when heated to temperatures between 1,400° and 2,000° F. It has a low density, is resistant of thermal conductivity, and has high sound absorption. New Mexico accounts for about 83% of domestic perlite production; the remainder is from Arizona, California, Colorado, Idaho, Nevada, and Utah. (See Meisinger, 1985.)

Expanded perlite can be graded by density (lbs/ft^3); the most widely used bulk-density is from 7 to 15 lbs/ft^3. Typical grades for various uses are:

Use	Density (lbs/ft^3)
Ceiling tiles	2-4
Filter aids	7-12
Horticulture applications	6-8
Lightweight concrete aggregate	7.5-8.5
Loose fill applications	6
Low-temperature insulation	2-4

Perlite is also used as an abrasive in soaps and cleansers, as a curing agent in caulking compounds, and in castings in foundries. (See Benton, 1984.)

In processing perlite, the first step is to crush the ore to 5/8-in. size in a primary jaw crusher. It is then passed through a dryer to reduce moisture content; the large quantities of fines that are produced throughout the processing are removed. The perlite is expanded in a rotary horizontal or

stationary vertical furnace; the ore is preheated just before injection into the furnace. This reduces fines and helps control the uniformity of the various sized product densities. The processed products are graded for specific uses. (See Meisinger, 1979.) Partially expanded or high density material is a result of low combined water or low heat (Benton, 1984, p. 2).

Perlite sampled during the field examination was within useable densities (table 2). However, if perlite expands poorly or not uniformly, it may have the density for certain applications, but is not commercially desirable. The perlite in the study area generally would not compete favorably with other commercial ores.

Using a tonnage factor of 13.0 ft^3/st, a low-grade perlite resource of approximately 15,000,000 st was calculated for the two large outcrops within the study area.

Sand and Gravel

Sand and gravel are found throughout the study area in washes and drainages. The largest occurrence is along Centennial Wash in the southeastern part of the study area. These occurrences have no unique characteristics and are far from existing markets. It is unlikely that they would be developed.

CONCLUSIONS

Inferred subeconomic resources of silver, gold, and perlite were found in the study area. Three areas of silver resources exist in calcite-barite veins near Keenans Camp in the southeast part of the study area: about 4,000 st averaging 10.03 oz/st was calculated from samples 26-29; about 7,000 st averaging 4.44 oz/st was calculated from samples 31-34; about 3,000 st averaging 6.02 oz/st was calculated from samples 35-40.

A subeconomic gold resource of about 400 st averaging 0.075 oz/st was calculated for a fault containing calcite, barite, and minor fluorite in granite.

Two large perlite outcrops were estimated to contain about 15,000,000 st of low-grade perlite. Sample analyses indicate the perlite falls into the useable density range, but that it would not compete favorably with other commercial ores from elsewhere because it expands poorly or not uniformly.

Sand and gravel is present in large quantities throughout much of the study area. The largest occurrence is along Centennial Wash. The sand and gravel has no unique properties and is distant from any markets; development is unlikely.

Oil and gas potential in the study area has been rated zero to low by the USGS because of the extensive Precambrian schists and gneiss exposures.

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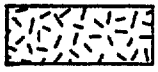
Witcher, J. C., Stone, Claudia, and Hahman, W. R., Jr., compilers, 1982, Geothermal resources of Arizona: Arizona Bureau of Geology and Mineral Technology Map, scale 1:500,000.

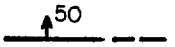
EXPLANATION OF SYMBOLS USED IN FIGURES 2-6.


GRANITE

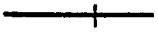

VOLCANIC BRECCIA

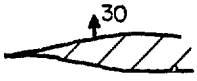

DACITE (?)


GRAPHIC GRANITE



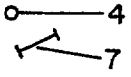
FAULT-Showing dip; dashed where approximate


VERTICAL FAULT



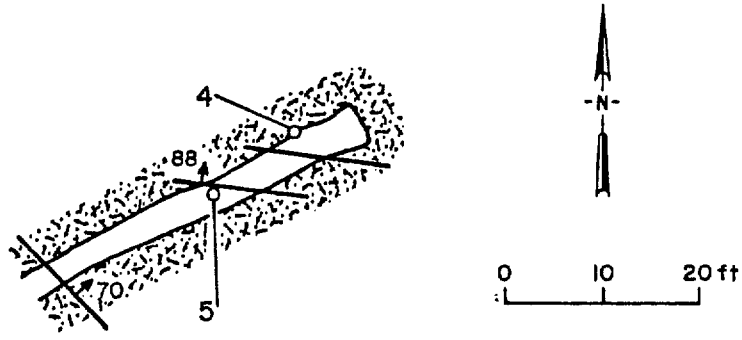
FAULT ZONE-Showing strike and dip; dashed where approximate


TOP OF WINZE



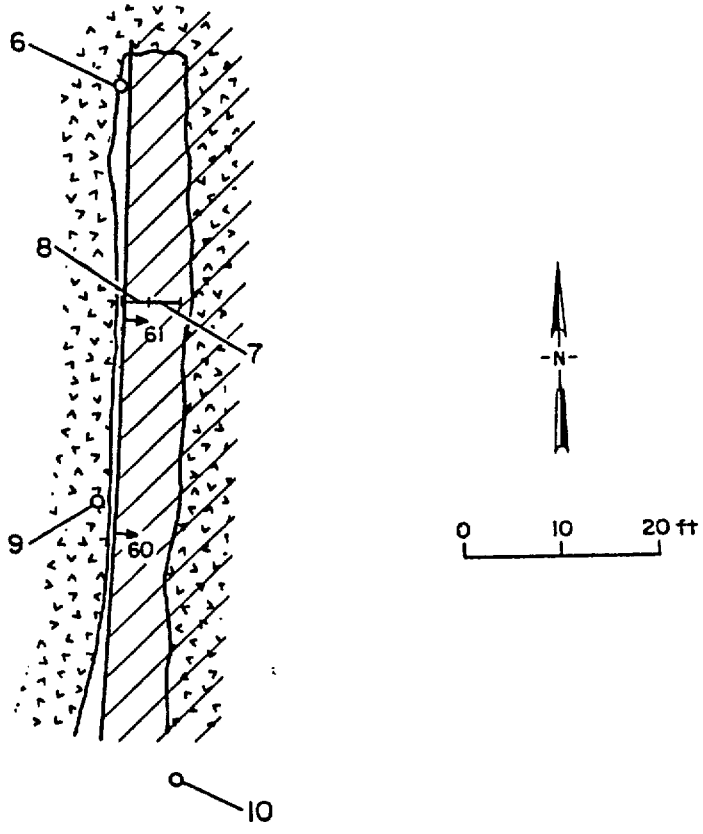
SAMPLE LOCALITY-Showing sample number


LESS THAN



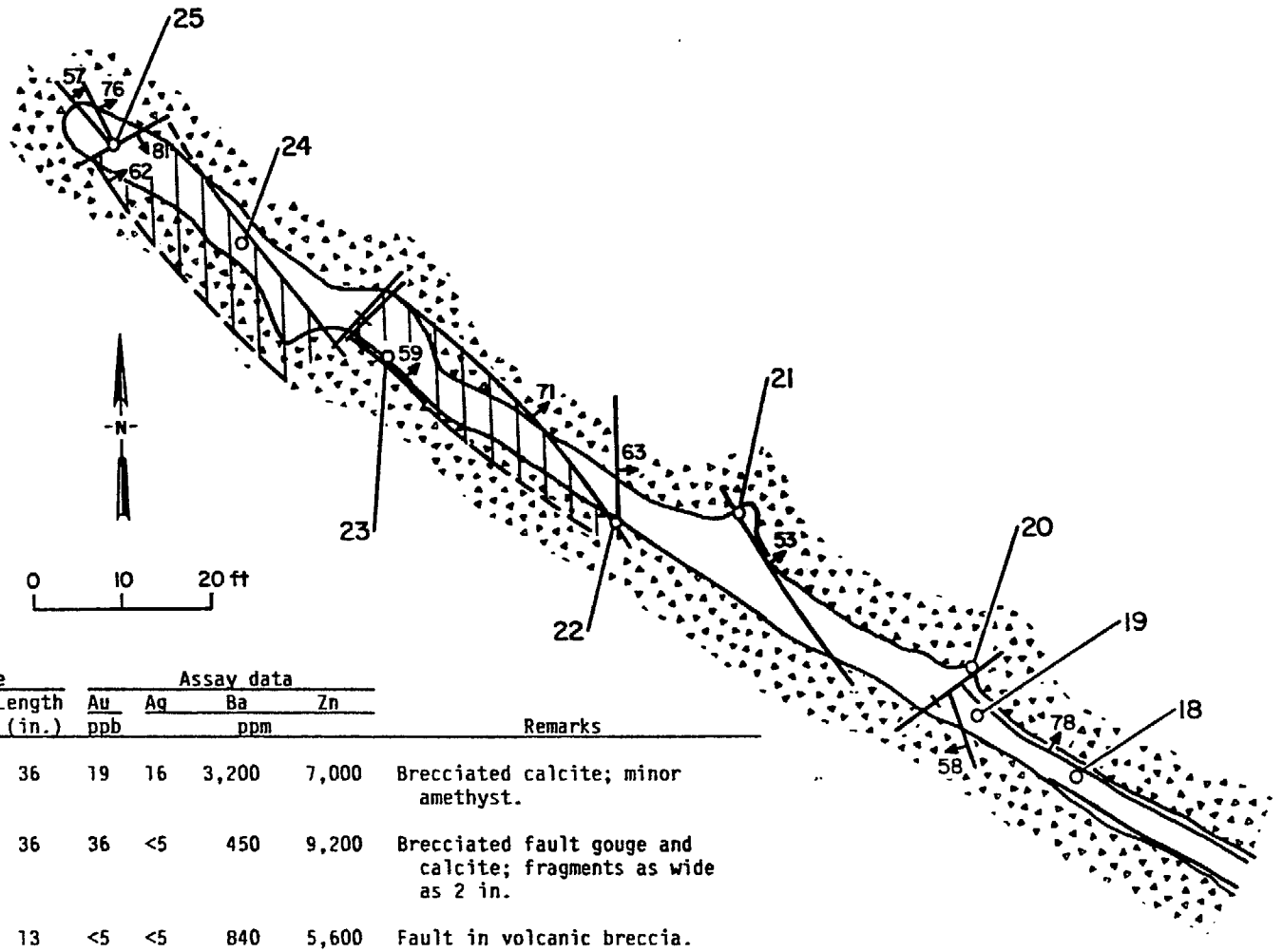
Sample No.	Type	Length (in.)	Assay data Au ppb	Ag ppm	Ba ppm	Other	Remarks
4	Chip	18	<5	<5	1,400	0.05% Mn	Brecciated granite, vuggy, abundant calcite crystals; minor manganese.
5	do.	26	7	<5	8,400		Fault in granite; small amount of gouge.

Figure 2.--Map and sample data for samples 4-5.



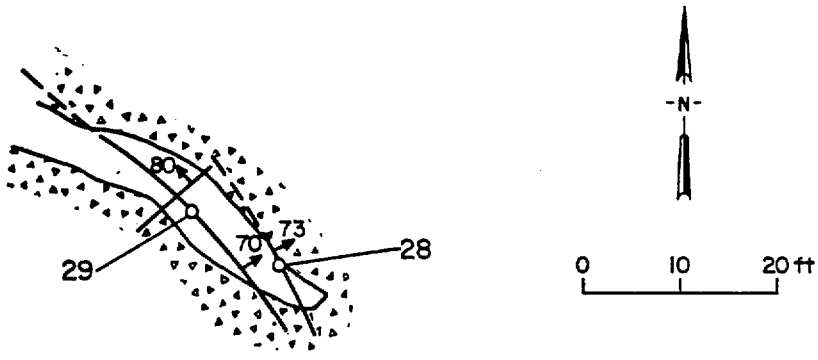
Sample No.	Type	Length (in.)	Assay data Au ppb	Ag ppm	Ba ppm	Zn ppm	Remarks
6	Chip	80	6	<5	180	2,100	Fault; very brecciated material; iron staining; clay gouge.
7	do.	50	<5	<5	340	400	Do.
8	do.	40	25	<5	290	12,000 (1.2%)	Do.
9	do.	32	50	120 (3.5 oz/st)	500	11,000 (1.1%)	Do.
10	do.	18	51	27	<100	11,000 (1.1%)	Fault; vuggy; calcite, quartz, fluorite(?).

Figure 3.--Map and sample data for samples 6-10.



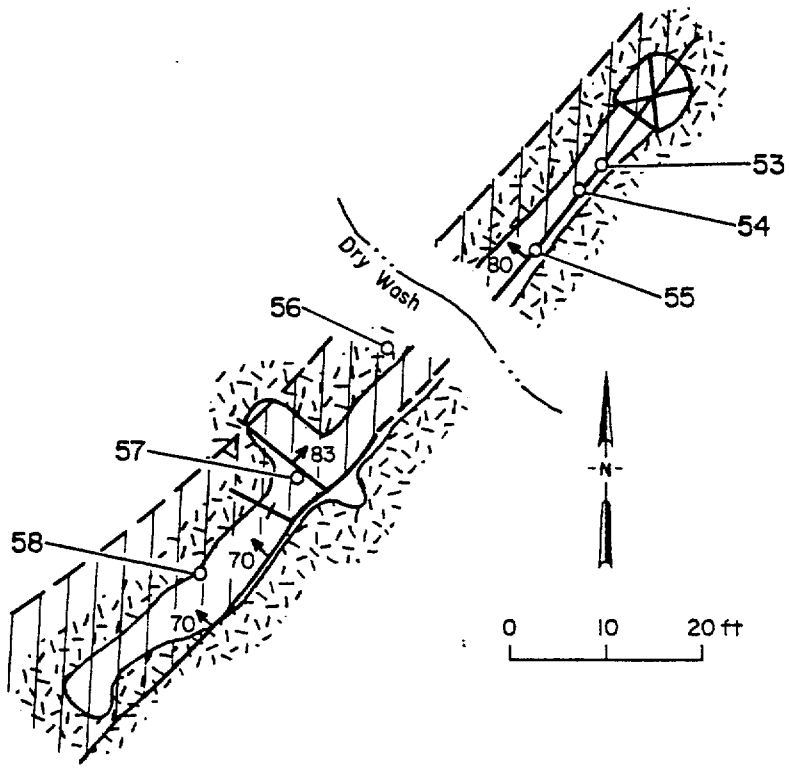
Sample No.	Type	Length (in.)	Assay data Au ppb	Ag	Ba ppm	Zn	Remarks
18	Chip	36	19	16	3,200	7,000	Brecciated calcite; minor amethyst.
19	do.	36	36	<5	450	9,200	Brecciated fault gouge and calcite; fragments as wide as 2 in.
20	do.	13	<5	<5	840	5,600	Fault in volcanic breccia.
21	do.	11	24	13	610	5,500	Fault; calcite veinlets; breccia fragments.
22	do.	26	36	13	720	21,500	Calcite pod; minor iron staining.
23	do.	40	14	11	930	2,300	Fault; sample mostly calcite; breccia.
24	do.	42	62	15	640	9,700	Do.
25	do.	32	22	8	500	1,200	Fault; very brecciated; minor amethyst, fluorite.

Figure 4.--Map and sample data for samples 18-25.



Sample No.	Type	Length (in.)	Assay data Au ppb	Ag ppm	Zn ppm	Remarks
28	Chip	48	<5	557 (16.26 oz/st)	2,500	Fault; calcite.
29	do.	30	<5	150 (4.38 oz/st)	1,700	Fault; calcite gangue; amethyst.

Figure 5.--Map and sample data for samples 28-29.



Sample No.	Type	Length (in.)	Assay data Au	Ag ppm	Ba %	Other ppm or %	Remarks
53	Chip	42	0.38 oz/st	<5	15.42	6.72% F 1,080 As 2,500 Zn	Fault; barite, calcite, fluorite.
54	do.	41	952 ppb (.028 oz/st)	<5	10.11	6.22% F 4,100 Zn	Fault; fluorite crystals, barite.
55	do.	32	717 ppb (.021 oz/st)	15	25.92	5.73% F 693 As	Do.
56	do.	47	.033 oz/st	9	14.78	4.19% F 7,300 Zn	Fault; fluorite and barite.
57	do.	62	.058 oz/st	<5	.82	9.76% F 3,800 Zn	Fault; barite, calcite, fluorite.
58	do.	60	320 ppb (.009 oz/st)	9	10.72	3.52% F 7,700 Zn	Do.

Figure 6.--Map and sample data for samples 53-58.

Table 1.--Analytical data for samples not shown on figures 2-6.

[Au, gold; Ag, silver; Ba, barium; Th, thorium; La, lanthanum; Ce, cerium; Sm, samarium; Fe, iron; Zr, zirconium; Zn, zinc; <, less than; ppb, part per billion; ppm, part per million; %, percent; (), converted to oz/st.]

Sample			Assay data				
No.	Type	Length (in.)	Au	Ag	Ba	Other	Remarks
			ppb	ppm, unless otherwise noted			
1	Chip	31	<5	<5	4,300		Fault in granite; strikes N. 47° W., dips 62° NE.; fractured granite.
2	do.	21	<44	<28	<660	1,680 Th 4,510 La 7,460 Ce 299 Sm	Taken across zone of high scintillometer readings in graphic granite; pods of biotite.
3	Select	-	<5	<11	370	85% Fe 1,800 Zr	Magnetite.
11	Chip	40	25	12	480	5,300 Zn	Fault; N. 18° W., 60° NE.; brecciated rhyolite(?); minor fluorite.
12	Grab	Random	88	34	<100	11,000 Zn	Dump material; vuggy, siliceous, brecciated tuff and rhyolite.
13	Chip	24	50	<5	0.31%	9,500 Zn	Fault; N. 71° W., 70° NE.; 1/2-in.-wide veins of calcite and barite, minor amethyst.
14	do.	19	12	15	.14%	5,900 Zn	Do.
15	do.	32	32	13	480	11,000 Zn 800 Zr	Quartz vein; N. 66° W., 55° NE.; alternating bands of quartz and gouge material; minor fluorite.
16	do.	34	170 (0.005 oz/st)	6	120	4,900 Zn	Same vein as above; massive quartz.

Table 1.--Analytical data for samples not shown on figures 2-6--Continued

Sample No.	Sample Type	Sample Length (in.)	Assay data Au ppb	Ag ppm, unless otherwise noted	Ba	Other	Remarks
17	Chip	41	28	14	400	13,000 Zn	Brecciated quartz vein; N. 74° W., 56° NE.; silicified, small quartz stringers and crystals.
26	do.	42	<5	360 (10.5 oz/st)	1,300	720 Zn	Fault; west, 86° N.; vuggy, brecciated, boxwork; fluorite(?).
27	do.	55	<5	240 (7.0 oz/st)	1,000	1,100 Zn	Same fault as above; west, vertical; small amethyst crystals; minor calcite.
31	do.	34	<5	110 (3.2 oz/st)	2,400		Calcite vein in fault; N. 23° W., 73° NE.; massive vein, black.
32	do.	58	<5	180 (5.3 oz/st)	5.7%		Same fault as above; volcanic breccia adjacent to calcite vein.
33	do.	38	<12	200 (5.8 oz/st)	13%		Calcite vein in fault; N. 27° W., 78° NE.; same vein and fault as samples 31 and 32.
34	do.	38	<25	100 (2.9 oz/st)	31%	1,200 Zn	Same vein and fault as sample 31-33; N. 45° W., dip not determined; abundant calcite.
35	do.	42	<5	170 (5.0 oz/st)	6.64%	1,600 Zn	Calcite-barite vein; N. 29° W., 89° NE.; minor quartz; definite banding of barite and calcite.
36	do.	14	<31	88	41.7%		Do.

Table 1.--Analytical data for samples not shown on figures 2-6--Continued

Sample No.	Type	Length (in.)	Assay data Au ppb	Ag ppm, unless otherwise noted	Ba	Other	Remarks
37	Chip	28	<18	280 (8.2 oz/st)	24.09%		Calcite-barite vein; N. 29° W., 89° NE.; minor quartz; definite banding of barite and calcite; adjacent to sample 36.
38	do.	42	<17	200 (5.8 oz/st)	16.93%	4,000 Zn	Fault; N. 41° W., vertical; vuggy, calcite veinlets less than 2 in. wide; calcite and barite banding.
39	do.	36	<17	180 (5.3 oz/st)	19.77%	2,500 Zn	Fault; N. 45° W., vertical; same fault as samples 38-40.
40	do.	36	<5	250 (7.3 oz/st)	6.31%		Do.
41	do.	16	6	180 (5.3 oz/st)	.3%	1,300 Zn	Fault; N. 31° W., 70° NE.; abundant hematite; minor calcite; siliceous.
42	do.	47	<5	636 (18.6 oz/st)	.17%	1,200 Zn	Fault in volcanic breccia; N. 31° W., 73° NE.; abundant hematite, minor calcite; silicified.
47	do.	18	<5	<5	6.14%		Brecciated schist, N. 60° W., 54° SW.; containing fractures.
48	do.	24	170 (0.005 oz/st)	<5	.26%	5,600 Zn	Fault in conglomerate; N. 22° W., vertical; consolidated.
49	do.	35	.065 oz/st	<5	.80%	6.49% Zn	Diabase; siliceous, disseminated barite.
50	do.	18	.048 oz/st	16	1.20%	4,550 Mo 1,500 Zn	Do.

Table 1.--Analytical data for samples not shown on figures 2-6--Continued

Sample No.	Sample Type	Sample Length (in.)	Assay data Au (ppb)	Ag (ppm, unless otherwise noted)	Ba (ppm, unless otherwise noted)	Other (ppm, unless otherwise noted)	Remarks
51	Chip	24	31	<5	34.53%	4,600 Zn	Fault in diabase; N. 35° E., 76° SE.; barite veinlets less than 2 in. wide; fragments of diabase in fault.
52	do.	13	480 (0.014 oz/st)	10	12.06%	7,800 Zn	Fault in diabase; N. 8° E., 37° NW.; disseminated barite.
59	do.	36	16	<5	5.61%	2,700 Zn	Fault in diabase(?); N. 30° E., vertical; barite, disseminated in fault; minor calcite.
60	do.	13	<16	<5	24.91%		Fault in altered granite(?); N. 20° W., 43° NE.; disseminated barite; minor iron-staining.
61	do.	18	<28	<5	33.63%	5,900 Zn	Barite vein; N. 15° W., 70° NE.; strike and dip estimated.
62	do.	Random	<34	<5	44.59%		Several barite veins in volcanic breccia; random strikes and dips.
63	do.	39	450 (.013 oz/st)	38	13.81%	3.72% Zn	Faults in volcanic breccia; N. 16° E., 71° SE.; calcite and barite veinlet as thick as 1 in.
64	do.	48	380 (.011 oz/st)	37	16.18%	20,100 Zn (2.01%)	Fault in volcanic breccia; N. 16° E., 71° SE.; little gouge; minor calcite, barite.
65	do.	50	150 (.004 oz/st)	18	.35%	6,200 Zn	Vein in volcanic breccia(?); N. 38° E., 55° SE.; massive black calcite.

Table 1.--Analytical data for samples not shown on figures 2-6--Continued

Sample No.	Type	Length (in.)	Assay data Au (ppb)	Ag (ppm, unless otherwise noted)	Ba (ppm, unless otherwise noted)	Other (ppm, unless otherwise noted)	Remarks
66	Chip	60	340 (0.01 oz/st)	50	0.72%	3.35% Zn	Vein in volcanic breccia(?); N. 38° E., 55° SE.; massive black calcite.
67	do.	16	58	<5	.12%		Fault in volcanic breccia(?); estimated N. 10° W., 60° NE.; mostly gouge material.
68	do.	20	.047 oz/st	8	.08%	9,600 Zn	Diabase(?) dike; N. 26° E., 80° NW.; abundant iron stains.
69	do.	36	340 (.01 oz/st)	<10	10.31%	3.58% Zn 4.5% F	Fault in volcanic breccia; N. 10° E., 40° SE.; 1-in.-wide veins of calcite and fluorite.
70	do.	36	250 (.007 oz/st)	<5	.13%	3.31% Zn	Fault in volcanic breccia; N. 11° E., 54° SE.; gouge material.
71	do.	30	350 (.01 oz/st)	<5	.16%	6.99% Zn	Calcite vein in volcanic breccia; N. 19° E., 86° NW.; massive, black calcite; inclusions of country rock.
72	do.	48	<5	<5	.12%		Siltstone/sandstone unit beneath conglomerate; poorly sorted.
73	do.	40	<5	<5	.11%		Do.
74	do.	40	<5	<5	.10%		Conglomerate unit above sandstone/siltstone (sample 72); poorly sorted and consolidated.
75	do.	50	<5	<5	.09%		Do.
76	do.	60	<5	<5	.12%		Conglomerate; well-rounded fragments up to 1 ft in diameter.
77	do.	66	<5	<5	.12%		Do.

Table 2.--Results of laboratory expandability tests of perlite samples from the Aubrey Peak Wilderness Study Area, Mohave County, Arizona.

Sample no.	Furnace preheat temp. (°F) 0	300	600	Furnace preheat temp. (°F) 0	300	600	Remarks
	Sample mass (oz)			Density (lbs/ft^3)			
30	0.43	0.32	0.46	16.00	13.25	8.63	No snapping, much dropout.
43	.38	.39	.30	6.69	6.75	5.25	Uniform but poor expansion, some snapping at 300°F.
44	.39	.41	.66	7.06	7.56	11.38	No snapping, very grey, much dropout at 300°F.
45	.35	.35	.53	6.19	6.38	9.00	Occasional snapping, very gray.
46	.37	.41	.49	7.00	7.44	8.69	Uniform but poor expansion.

Table 3.--Commodities summary for the Aubrey Peak Wilderness Study Area, Mohave County, Arizona.

[Data from U.S. Bureau of Mines Mineral Facts and Problems and Mineral Commodity Summaries, 1988.]

Commodity units	Domestic mine production	Apparent consumption	Major import sources	Import reliance (%)	Average 1988 domestic price (U.S. dollars)	Expected U.S. demand through 1988	Major uses
Gold tr oz	4,900,000 (1987)	2,800,000 (1987)	Canada Switzerland Uruguay	Not available	440 (July 1988)	Annual increase rate of 2.0%	Jewelry and electronics, dental.
Silver tr oz	38,000,000 (1987)	144,000,000 (1987)	Canada Mexico United Kingdom Peru	57 (1987)	7.31 (July 1988)	Annual increase rate of 2.2%	Photography, electrical and electronics, sterling ware, electroplated ware, jewelry, brazing alloys and solder.
Perlite short tons	520,000 (1987)	550,000 (1987)	Greece	6 (1987)	31.71 (1987)	620,000	Building construction products and filter aids.

DEPARTMENT OF THE INTERIOR
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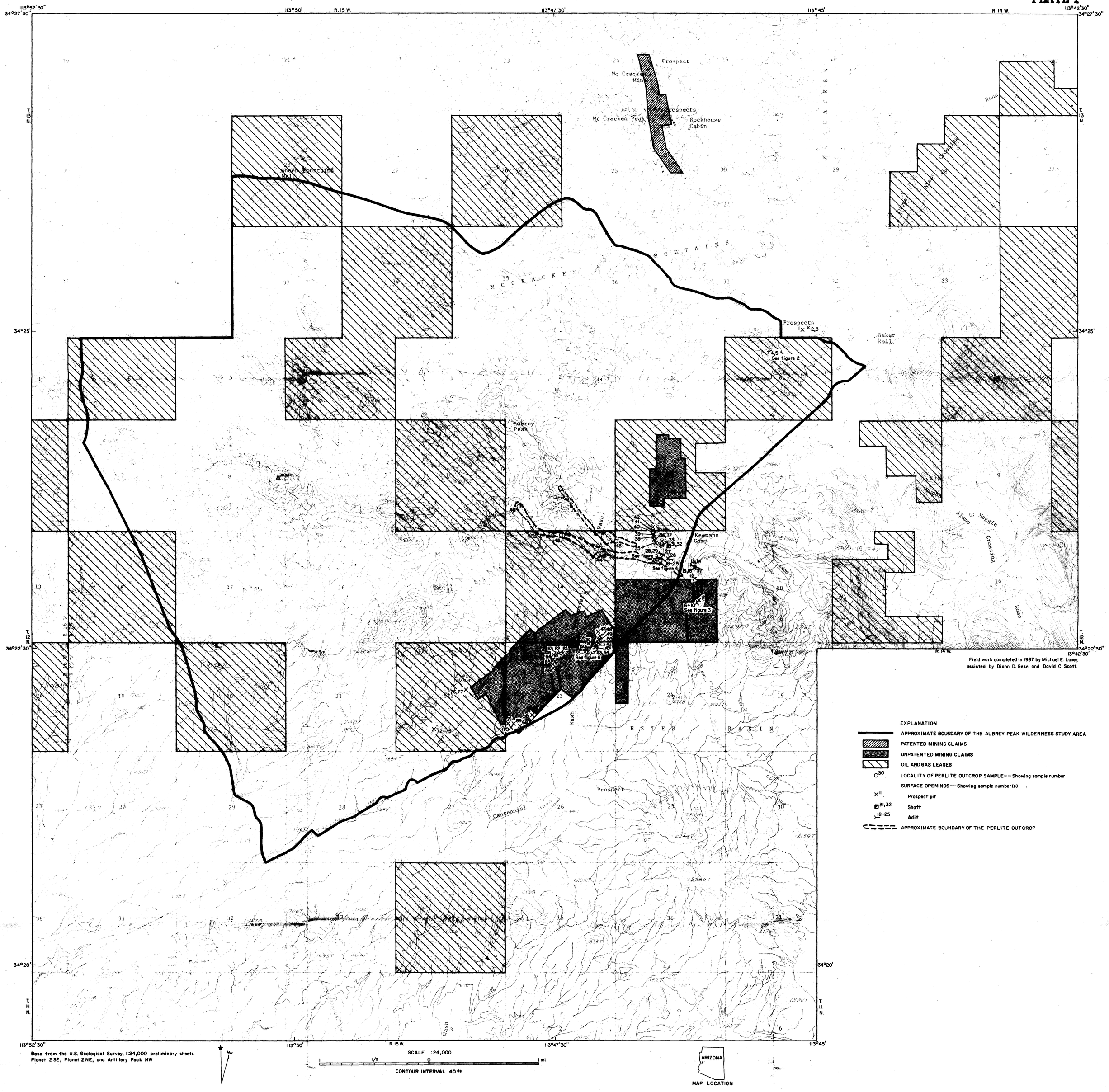
PLATE 1



MINE AND PROSPECT MAP OF THE AUBREY PEAK WILDERNESS STUDY AREA, MOHAVE COUNTY, ARIZONA

BY

MICHAEL E. LANE, U.S. BUREAU OF MINES

1988

United States Department of the Interior
BUREAU OF MINES
P. O. BOX 25086
BUILDING 20, DENVER FEDERAL CENTER
DENVER, COLORADO 80225
INTERMOUNTAIN FIELD OPERATIONS CENTER

TAKE PRIDE IN AMERICA

May 14, 19[illegible]

Nyal Niemuth
Arizona Dept. of
Mines & Mineral Resources
Mineral Building Fairgrounds
Phoenix, AZ 85007

Dear Mr. Niemuth

Enclosed is a copy of the following U.S. Bureau of Mines Open File Re[illegible]ort;

MLA 39-88

Thank You!

Roger D. Villalobos

USBM-IFOC-RE
P.O. BOX 25086, DFC
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