

MINERALS AVAILABILITY SYSTEM

ARIZONA FLUORSPAR

ARIZONA DEPARTMENT OF MINERAL RESOURCES

PHOENIX, ARIZONA

GRANT NO. G0254012.

AUTHORS	
Arizona Department of Mineral Resources	
DATE	
1976	
TITLE1	
Arizona fluorspar minerals availability system 4 copys: Arizona Department of Mineral Resources, no page numbers	
TITLE2	
GENCTY	
LATITUDE	LONGITUDE
0	0
KEYWORDS	
castle dome, peak production WWI, 25 properties described	
SUBJECT	
NONMETALLICS	

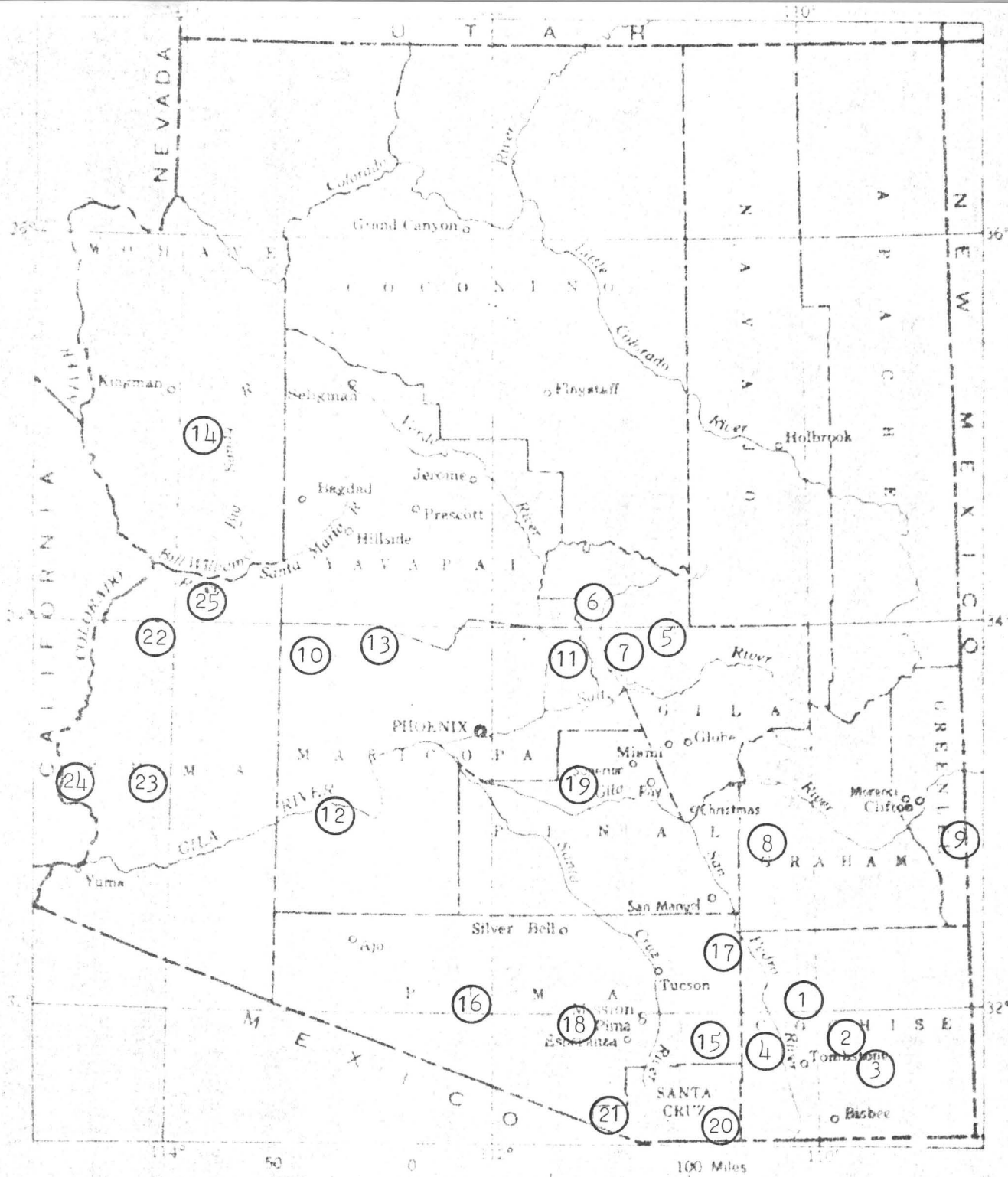
March 25, 1976

ARIZONA FLUORSPAR
MAS PROJECT

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otherwise would not have been mined. Further this concentrator will now be used to concentrate the ore from the Jerky group about 60 miles by road east of the mill.

A second important step is to have a better regional geologic study of known fluorspar occurrences. The Jerky group is also an example of this; here the mineralization occurs along about a mile of an east-west shear zone regionally mapped for 4 or 5 miles. About 15-20 miles west of this zone is the Bluebird mine also on a relatively strong E-W shear and having had about 15,000 tons production and about 10,000 tons or more reserves. The general region between these deposits has a few minor fluorspar occurrences. These have not been examined but when they are, the objective should be geologic reconnaissance as well as appraised of potential reserves. Past production and potential reserves within the Tonto Basin-Fluorine districts far overshadow other areas in the state. What we learn here may help elsewhere.



PRINCIPAL FLUORSPAR DISTRICTS

COCHISE:

- 1 Cochise
- 2 Pearce
- 3 Swisshelm
- 4 Whetstone

GILA:

- 5 Fluorine
- 6 Rye
- 7 Tonto Basin

GRAHAM:

- 8 Aravaipa

GREENLEE:

- 9 Duncan

MARICOPA:

- 10 Ellsworth
- 11 Granite Mtn.
- 12 Painted Rock Mtns.
- 13 Vulture

MOHAVE:

- 14 Cedar Valley

PIMA:

- 15 Empire
- 16 Horseshoe Basin
- 17 Redington
- 18 Sierrita

PINAL:

- 19 Mineral Hill

SANTA CRUZ:

- 20 Harshaw
- 21 Oro Blanco

YUMA:

- 22 Bouse
- 23 Castle Dome
- 24 Silver
- 25 Swansea

PRINCIPAL FLUORSPAR DISTRICTS

COCHISE COUNTY

Swisshelm Districts

This area is about 10 miles east of Elfrida. Only one occurrence was noted here, however, its potential is small. The ore occurs in an interbed fault in limestone near its contact with Laramide granite. A 40-ton dump contains about 40% fluorite.

Pearce District

This district is about 3 miles east of the town of Pearce and is underlain by Tertiary rhyolite porphyry. Fluorspar occurs in NW trending shear zones; post mineral movement has broken and diluted the mineralization rendering much of it uneconomical. The Fluorine Hill mine, the only property examined, has some ore assumed mineable. Traces of uranium mineralization and some gold and silver ore also reported.

Whetstone District

This mining district is in the eastern foothills of the Whetstone Mountains and is about 12 miles SSW of Benson. The Lone Star mine is the only fluorspar property examined; this area is underlain by Precambrian quartz-sericite schist, with fluorspar occurring in a northwest trending vein. The potential of the district is not determinable as underground workings are unsafe and surface exposures are poor; however, the mine is reported to have had a production of at least 20,000 tons.

GILA COUNTY

Tonto Basin Area

This area northeast and east of Punkin Center is largely underlain by Precambrian granite upon which rests the younger Precambrian Apache group. A younger Cretaceous (?) granite intrudes the older rocks at the Quartz Ledge occurrence where fluorspar veins occur in both the older and younger granite. At the Bluebird the veins are found in a rhyolite, probably a lower member of the Apache formation, resting on the granite which is the predominant rock in the area. At the Red Rock fluorspar occurs in a vein in Apache quartzite. Production from the district has been about 20,000 tons milled at the Punkin Center mill; at least this same quantity should be found with more exploration.

Fluorine (Sierra Ancha) District

This is near McFadden Peak west of State Route 288. The area is underlain by Dripping Springs quartzite of the Precambrian Apache formation in the vicinity of the Jerky group, the only fluorite deposit examined in the district. The quartzite here is largely feldspathic or "dirty" and found to be flat lying. Fluorite occurs in a shear zone traceable for over a mile and intersected by drilling at depths of 200 to 300 feet. Exploration results obtained by U. S. Steel Corporation here make this one of the principal fluorite potentials in the state. About 300,000 tons of 65% fluorite reserves are inferred.

GRAHAM COUNTY

Arivaipa District

The area near Jackson Mountain is underlain by Precambrian granite. The Jackson Mountain or Rhodes mine has the only fluorite potential. Past production is reported to have been about 1,200 tons of 60-70% CaF_2 . Small potential reserves may be available from the narrow veins.

Near Turnbull Mountain barite and fluorspar occur in vein type deposits which may have minor potential if milling facilities were available.

GREENLEE COUNTY

Duncan District

This area is approximately 3 miles long northwest to southeast and 1 mile wide. It begins about 10 miles northeast of Duncan of rolling terrain with rarely more than 75 feet of relief in the vicinity of the deposits.

The district is underlain, mainly, by intrusive andesite porphyry which in turn has been intruded by rhyolite with which most of the fluorspar deposits are associated. Rhyolite dikes have been brecciated and cemented with quartz, iron and manganese minerals along with minor calcite and fluorite. Most dikes extend for a few thousand feet but the productive fluorspar occurs as erratically disposed lenses rarely more than 100 feet in length and 5 feet wide.

Mines in this district are probably the oldest fluorspar producers in Arizona, having been opened in 1918 near the end of World War I. They remained dormant until about 1936 when production was again resumed, which continued until sometime after World War II.

MARICOPA COUNTY

Ellsworth District

The Ellsworth district is assumed to be the east slope of the Harquahala Mountains and the north part of the Harquahala Plains.

Host rocks are Precambrian metamorphics, usually limey hornfels, quartzite and some schist. Fluorite mineralization occurs in veins and is always associated with irregular intrusions of diorite. The Snowball, one of the more important deposits in the state, occurs here. It has had a few hundred tons of production and is assumed to have 5,000 to 10,000 tons of reserves. Concentrating facilities are not available.

Vulture District

That part of the Vulture district containing fluorspar is situated a few miles south of Wickenburg. Regionally this area is underlain by Precambrian granite and schist upon which rest Cretaceous flows. The fluorspar occurs in veins and is always associated with minor irregular porphyritic diorite intrusives.

Fluorspar mining here was as early as the twenties and the last was in the fifties. Total production has been about 5,000 tons and several times this amount as low grade mill feed could probably be found by careful exploration.

Granite Mountain Area

The Granite Mountain area is northeast of the Fort McDowell Indian Reservation and a few miles east of the Verde River. The region is underlain by Precambrian granite with occasional cover of Tertiary basalt flows. A lens of fluorite here is impressive but the area requires additional exploration now hampered by inaccessibility.

PIMA COUNTY

Sierrita District

The Gunsight mine lays about 20 miles airline southwest of Tucson. In the vicinity of the mine Paleozoic schist has been intruded by Cretaceous granite. The fluorite occurs in veins associated with pegmatite dikes near the contact. Records indicate a few tons of production and it appears some additional fluorspar could be found in the narrow veins. No important potential is indicated.

YUMA COUNTY

Castle Dome District

The Castle Dome district is about 43 miles by road northeast of Yuma at an elevation of about 1400 feet. The area is underlain by Mesozoic shale and schist, and in some cases siltstone or impure limestone. These units are intruded by porphyritic diorite and rhyolite. Veins here are extremely persistent in length, being traceable to 4000 feet or more.

The district's principal importance is for lead-silver ore. Other than a five year period when a mill was operated on the Gila River during World War II, and somewhat later, milling in the area has been more or less inefficient due to lack of water. Considerable dry concentrating has been done in the district.

This is one of the principal potentials for fluorite in the state largely because it is associated with other valuable minerals and may be concentrated as an important by-product. In most parts of the district the fluorspar content is high, although, seldom enough for the ore to be mined only for this commodity.

It appears that production has been about 50,000 tons of fluorspar ore and concentrate from the district. Information available indicates about 30,000 tons of reserves left, largely as stope fill and dumps. The greatest hazard to these reserves, particularly the dumps, is inefficient milling practice which gradually dissipates an appreciable fraction of the reserves.

YUMA COUNTY (cont'd)

Silver District

The Silver district is about 31 miles north of Martinez Lake. It is largely underlain by Cretaceous andesite although Laramide (?) granite was noted in the immediate area. This is essentially a silver district and the Silver King property, only fluorite occurrence noted, has produced small tonnages of lead, silver and fluorite. Small fluorite reserves may be developed.

Bouse District

The Bouse district covers a rather large area with different geological conditions. That part of the district about 9 miles south of Bouse is underlain by an andesitic volcanic agglomerate. A rather important barite-fluorspar vein deposit extensively explored by the U. S. Bureau of Mines and others occur here. Small fluorite reserves here depend on concentrating facilities to be economic.

About 5.5 miles north of Bouse is a prominent black mountain in which Cretaceous andesite or basalt is overlain with a thin veneer of Cretaceous (?) limestone. Several veins here contain barite and fluorspar that could be economical if milling facilities were available.

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District

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Cochise
Pearce
Swisshelm
Whetstone

Gila County

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Osborn
Bluebird (Packard)
Quartz Ledge
Red Rock

Fluorine (Sierra Ancha)
Rye
Tonto Basin
Tonto Basin
Tonto Basin

Graham County

Barium King
Coronado
Graham
Grand Reef
Marcotte
Mt. Jackson

Aravaipa

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"
"
"
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Greenlee County

Daniels
4th of July
Goat Camp
Lucky #1 & #2
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Duncan

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Mineral Hill

Santa Cruz County Alta Ruby Patent

Harshaw Oro Blanco (Ruby)

Yuma County Black Mt. Burro Happy Day Pay Day Red Chief White Christmas Colorada Flora Temple-Castle Dome Nayal Northeastern Area Senora - Big Dome-Promontorio Rialto (Hull) Strong Silver King Swansea

Bouse " " " " " " Castle Dome " " " " " " Silver Swansea

Alta

Summary:

Argentiferous galena was mined here from a quartz diorite cut by a rhyolite dike. Gangue minerals according to the literature were quartz and reddish fluorite (Schrader, 1915). No fluorite was seen on the property during an examination by William Hirt on June 22, 1975.

Location:

The mine is in the Patagonia Mountains in NE/SE of Sec 4, T23S, R16E, in Santa Cruz County, Arizona. It can be reached by driving to Harshaw from Patagonia (about 8 miles), then going 0.9 miles west along the road from the intersection at Harshaw townsite, then turning left for 0.3 miles to the mine.

Mineralization and Development:

The host rock is quartz diorite cut by a 20 foot wide dike of rhyolite breccia in the mine area. Considerable silver-bearing galena was mined before 1900.

Shafts 300' deep or more and 400 feet of drifting were opened during the course of mining. At the time of the examination, all shafts were filled in or caved shut.

According to USGS Bulletin 582 (1915) the gangue was quartz and reddish fluorite. Examination of the dump disclosed some copper oxides, sphalerite, pyrite, and iron oxides, but no fluorite at all was seen on the dump. Probably some mistake was made in the USGS bulletin (copy attached).

Reference:

Schrader, F. C., 1915, Mineral Deposits of the Santa Rita and Patagonia Mountains, with contributions by J. M. Hill, USGS Bulletin 582, pp. 271-272.

BARIUM KING PROPERTY

The Barium King #1-4 unpatented lode claims are located in the SE₁ of Section 13, T. 4 S., R. 19 E., G. & S.R.M. The validity and present owners of the property are unknown. The property is part of the so-called Mineral Strip; it is assumed that mineral rights within this area are owned by the San Carlos Apache Tribe.

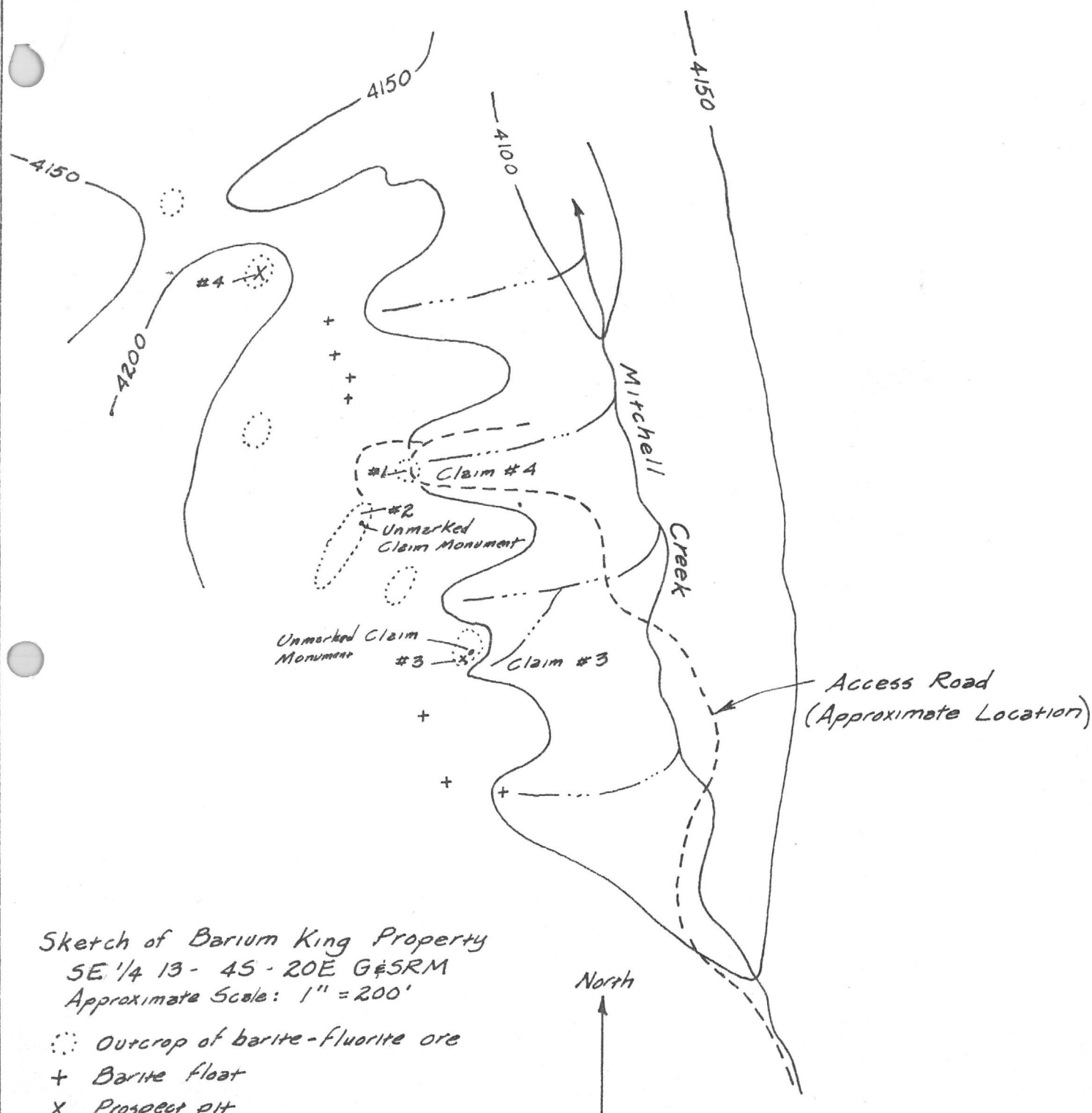
The property is accessible from the Coolidge Dam Road (old US 70) by turning south on a dirt road 13 miles (21 km) east of Coolidge Dam and traveling about 9 miles (14.5 km) to the fence marking the south boundary of the San Carlos Reservation. At the time of the field examination (1-7-76) the gate through the fence was locked. About 325 meters south of the gate is the House ranch, now abandoned. About 100 meters south of the gate a 2.8 mile (4.5 km) jeep trail leads southwest to the property. Only the first 0.6 miles (1 km) are passable; the remainder of the road is closed by washouts. On the San Carlos Reservoir 15' topographic map the road ends when it reaches Mitchell Canyon; at one time, however, it extended 0.9 miles (1.4 km) down Mitchell Canyon to the exposures on claim #4. This portion of the road has been almost completely obliterated by floods; only those portions above high-water mark have survived. No traffic has been over the road in some years; the road is covered with vegetation along its entire length, some of it 5 feet tall. It is doubtful whether an all-weather road could be constructed over the existing route. An alternate route would have to be found which avoided the major drainages. The nearest milling facilities are at Punkin Center, about 96 miles away.

The property is situated on the west slope of Mitchell Canyon. The exposure on claim #4 is approximately 100 meters west of the creek near the headwaters of a small west-bank tributary. Topographic relief in the area is

about 400 feet (122 meters); the average slope angle is 22 degrees. Vegetation consists of juniper, manzanita, oak and agave and is moderately dense. Average elevation of the property is 4120 feet (1256 meters).

The bulk of barite occurring on the property occurs as masses of brecciated barite up to six inches in diameter mixed with rock fragments and cemented with iron-stained fine-grained barite. A few small veins of white crystalline barite were also noted, none more than a foot or so thick. The outcrops of brecciated barite occur near the east edge of a body of rhyolite porphyry. The exposures have been previously described by Stewart and Pfister (USBM Report of Investigation RI 5651, 1960, page 26). A previously unreported exposure which has been prospected with a bulldozer trench was found about 630 feet (193 m) north of the outcrop on claim #4. Sample #4 was collected from this trench. Barite float was observed almost continuously northwest from the exposure on claim #3 a distance of 2400 feet (725 m) to the crest of a prominent hill overlooking the junction of Mitchell and Kelly Canyons.

Considerable trenching would be necessary to determine the extent and continuity of mineralization on the property due to heavy brush and abundant landslide debris. Until this is done, no meaningful estimate of reserves can be prepared.



Sketch of Barium King Property
 SE 1/4 13-45-20E G&SRM
 Approximate Scale: 1" = 200'

- Outcrop of barite-fluorite ore
- + Barite float
- X Prospect pit
- #3 Sample location

1-12-76 R.G.

The barite vein, striking N. 30° W. and dipping 75° NE., occurs in a fracture in coarse-grained granite. The location pit, 12 by 6 by 10 feet deep, shows mineralization 12 inches wide at the surface and increasing to 16 inches at the bottom. Contact between the barite and the wallrock is irregular with barite stringers running into the granite. The vein is composed of tabular crystal aggregates, fine to coarsely bladed, and partly of massive barite. Fluorspar occurs sparingly in the angular interstices between barite crystals, which are stained with iron oxide. A representative sample assayed 77.8 percent BaSO₄ and 4.9 percent CaF₂.

Because of alluvial cover, the vein cannot be traced uphill to the north, but down the slope to the southeast occasional patches of the vein are exposed. A quartz dike, striking northeast along the north bank of the wash, 50 feet wide. A prospect cut in the dike, some 200 feet southeast of the location pit, shows the barite-bearing fracture to be about 8 inches wide.

A 6-inch width of barite was observed across the wash in the south bank. At this place the barite vein lies on the contact of coarse-grained granite on the hanging wall and a foot wall of highly altered, fine-grained intrusive dike. The dike is about 30 feet wide and contains traces of barite in fracture planes throughout this width. Overburden covers any extension of the vein to the southeast.

Although the strike of the Graham vein is somewhat more northerly than that of the Marcotte zones, it is likely an extension of the same fracture system. Mr. Marcotte states that there are numerous places between the two properties where barite outcrops can be observed.

Barium King Group

The Barium King group, comprising four unpatented claims, is in sec. 19, T. 4 S., R. 20 E., and sec. 24, T. 4 S., R. 19 E., 5 miles west of Turnbull Mountain. The claims are 9 miles south of San Carlos Reservoir. This deposit was known before 1925--as Ross¹¹ states "Near Kelly Canyon, somewhat less than 2 miles southeast of the Starlight mine, is a vein containing barite, which has been prospected with a view to mining that material." At about this time Charles Ireland, of Globe, owned these claims but allowed them to lapse.

The claims, now known as Barium King Nos. 1 to 4, were located in April 1954 by Ralph Castenada and J. E. Boatwright. At the time of the examination in April 1957 the ownership included Urbane House, of Globe, on whose cattle range the claims were situated.

The property is accessible from old U.S. Highway No. 70 by turning south on a dirt road at 13 miles east of Coolidge Dam, traveling about 9 miles to the House Ranch buildings, just outside the Reservation boundary. From the house, a 2.8-mile truck trail leads west to the claims, which are on the west

¹¹/ Ross, Clyde P., Geology and Ore Deposits of the Aravaipa and Stanley Mining Districts, Graham County, Ariz.: U.S. Geol. Survey Bull. 763, 1925, p. 144.

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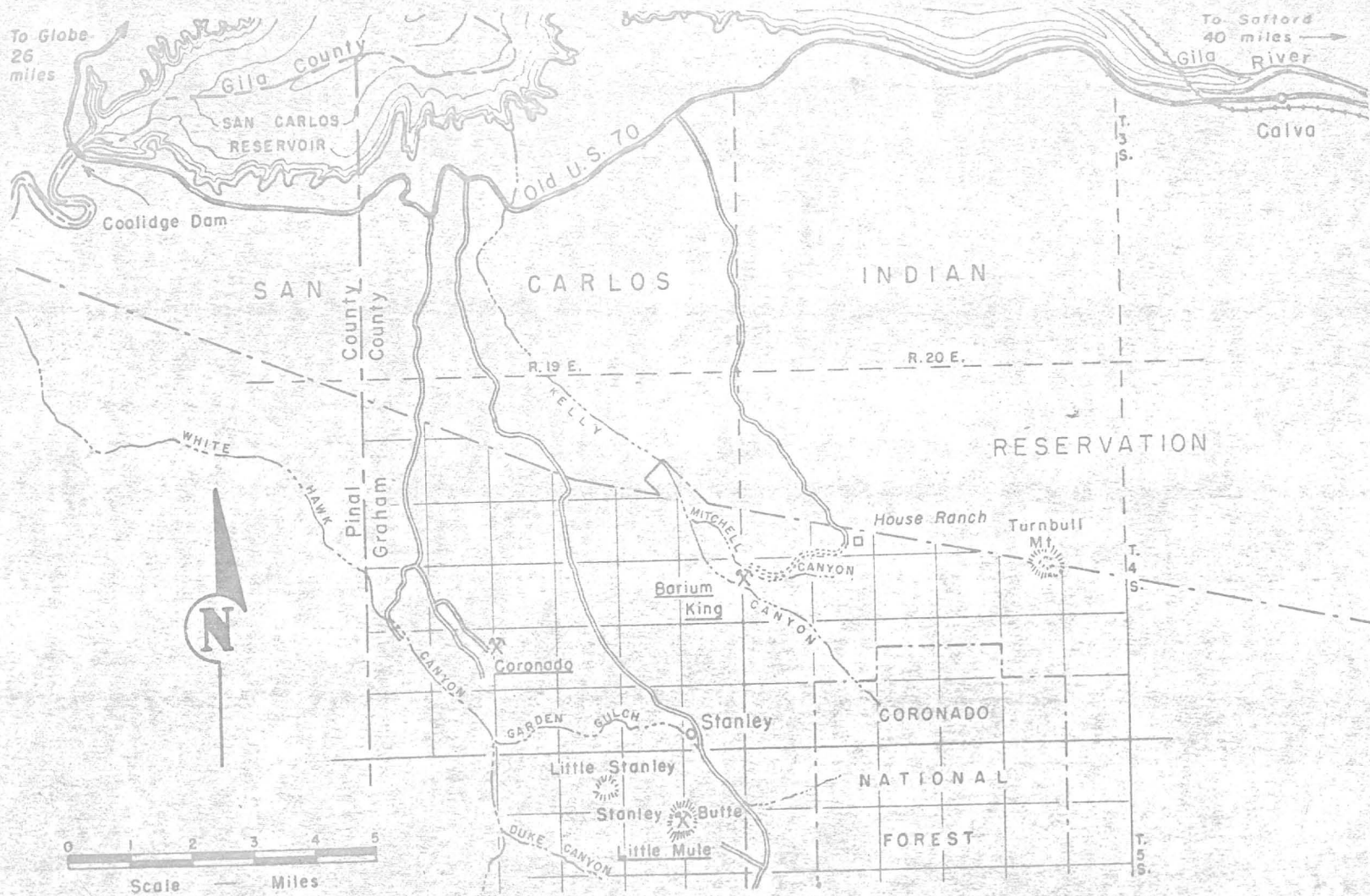


FIGURE 7. - Location Map of Barite Deposits South of San Carlos Reservoir, Graham County.

bank of Mitchell Canyon. The deposit is 24 miles from Calva, a station on Southern Pacific Railway, which is the nearest rail shipping point (fig. 1).

Three separate deposits occur on the property, but not enough work has been done to definitely delineate either the width or lateral extent of the deposits. Mineralization of all the occurrences is similar--brecciated barite and rock fragments, cemented with iron-stained, fine-grained barite. The host rock generally is trachyte.

The deposit at the end of the road is on claim 4 at an altitude of approximately 4,200 feet. A shallow cut, a dozed bench above, and outcrops on the hillside have exposed barite in a vertical range of about 60 feet. The west side of the mineralized zone is against a southerly striking fault that dips 55° E. The width of mineralization, as indicated by surface exposure, is at least 50 feet, and parts of this exposure can be traced for about 200 feet southward up the hillside.

The deposit on claim 3 is about 1,000 feet to the southeast at approximately the same elevation. Mineralization is fairly well exposed along the hillside by dozer stripping and by outcrops over an area of 50 by 150 feet in a vertical range of some 30 feet. A 10-foot shaft was excavated in barite near the east side of the exposure.

On claim 2 there is an unprospected zone of barite. It is west of the road end and at least 150 feet higher on the ridge. In noncontinuous patches where there is no soil barite can be observed in an area of 60 feet along the hillside by 20 feet up the steep slope. About half of the longer dimension is obscured by a rock slide, so the continuity of mineralization in this direction is in doubt.

Except for the deposit on claim 4, where the hanging wall can be observed, information on the strike and dip of the ore zones was unavailable at the time of the examination. Considerable exploratory work would be required to determine these data. The deposits on claims 3 and 4 appear to be overlain by capping formations.

A sample typical of deposit 3 assayed 62.2 percent BaSO_4 and 10.6 percent CaF_2 and had a specific gravity of 3.64. A 150-pound sample of deposit 4 assayed the following percentages: 64.8 BaSO_4 , 11.5 CaF_2 , and 0.5 CaCO_3 ; specific gravity was 3.71.

Metallurgical Tests

Bench-scale flotation tests were made on the latter sample to determine the grade of barite and fluorspar products obtainable. Two methods of selective flotation were tried. In one the barite was floated first, and in the other the reverse process was followed. Both methods yielded a good grade of barite products, but neither gave satisfactory recovery of fluorspar.

A barite concentrate assaying 92.5 percent BaSO_4 and having a specific gravity of 4.31 was obtained by flotation of minus-200-mesh ore with petroleum

sulfonate collector. The concentrate accounted for a barite recovery of 71 percent. Subsequent flotation of the fluorspar with oleic acid yielded a fluorspar product assaying 96.7 percent CaF_2 and accounting for 31.1 percent of the fluorspar. The above method of flotation comprised grinding the ore with caustic soda at a pH of about 10.5, followed by conditioning the pulp with sodium silicate and floating the barite with petroleum sulfonate. The rougher froth was cleaned three times. Middlings from the first two cleaning operations were added to the barite tailings; the pH then was adjusted to 9.5 with caustic soda and sodium fluoride, and calcium lignin sulfonate was added five times, using small amounts of calcium lignin sulfonate in each cleaning to depress the activated gangue. Treated water was used throughout the test; the flotation pulps were maintained at a temperature of 30° C. Reagent consumption was as follows: 2.0 pounds of caustic soda, 5.0 pounds of sodium silicate, 1.0 pound of petroleum sulfonate, 4.0 pounds of sodium fluoride, 0.16 pounds of calcium lignin sulfonate, and 0.16 pound of oleic acid per ton of ore feed.

Treating the ore by the lignin-fluoride flotation method yielded a concentrate assaying 96.1 percent CaF_2 with a fluorspar recovery of 38 percent. Flotation of the barite from fluorspar rougher tailing gave a concentrate assaying 92.5 percent BaSO_4 . The barite product had a specific gravity of 4.30, which accounted for a barite recovery of 27 percent. Recovery was low, owing to distribution of the mineral throughout the fluorspar middlings. The lignin-fluoride method comprised grinding the ore charge with sodium fluoride and lignin sulfonate at a pH of about 9.5 to 10, followed by recovery of the fluorspar with a small quantity of oleic acid. The addition of more oleic acid to the fluorspar rougher tailing promoted flotation of the barite. Reagent consumption was as follows: 4.0 pounds of sodium fluoride, 4.0 pounds of lignin sulfonate, and 1.0 pound of caustic soda per ton of ore in the grinding; 0.16 pound per ton of oleic acid in the fluorspar rougher and 1.6 pounds per ton of lignin sulfonate in the fluorspar cleaners; and 0.96 pound per ton of oleic acid in the barite rougher. Research is being continued in an effort to develop a reagent combination that will permit recovery of acid grade fluorspar products and improve recovery of the barite.

Little Mule Group

The Little Mule group, comprising six contiguous, unpatented claims, in secs. 2, 11, and 12, T. 5 S., R. 19 E. (fig. 7), lies atop Stanley Butte at an average altitude of 6,700 feet (fig. 8). This mountain is composed of volcanic rocks. In the area investigated the predominant rock visually has been classified as diorite porphyry. Barite occurs in fractures at several places on or near the top of the mountain, in an area of steep terrain and difficult access.

The claims originally were located by Bob Knowles about 1907. Knowles is said to have worked some of the claims intermittently for several years for the silver values in the barite. Reed R. Crunk and associates relocated the claims in 1955 and 1956.

FIGURE

The project is 33.5 miles southward from the road on a pilot southeast of the road covered here known as the

A few miles, are the working conditions somewhat better than the shaft. As far as the shaft was made

About 1907, the shaft was caved so that it was in the dump. The shaft had a striking S

Big Spar Mine

Summary:

The Big Spar shown on the Vulture 15' USGS topographic quadrangle is about 7 miles southwest of Wickenburg, Maricopa County, Arizona. The property has been the site of a small fluorite gravity concentrator where ores from several nearby properties were concentrated and blended. Shipments from here were reported from 1939 through 1953, however, all but about 1000 tons came from other nearby properties. The Big Spar was examined by William C. Hirt and Victor E. Kral on May 1, 1975.

The fluorite occurs in a shear zone on and near a granite-trachyte contact traceable for about 1000 feet; however only the northwestern 500 feet contains appreciable fluorite and only a small part of this has been mined. Although low grade material was noted northwest of the main shaft it is too lowgrade for a mill; however, further exploration may find reserves. A 200-foot length of shear zone southeast of the main shaft warrants exploration; a 2.5-foot sample in an old pit contains 43% CaF_2 and low silica.

Introduction:

The Big Spar, owned by J. D. Campbell of Wickenburg, is shown on the Vulture 15' USGS topographic quadrangle in the NE/4, NE/4 of section 4, T6N, R5W in Maricopa County, Arizona. It is reached by taking the Vulture mine road (one mile west of Wickenburg) south from U.S. 70, travelling 3.2 miles southwesterly, then turning left (southerly) on a dirt road (Vulture Peak Road) for 2.7 miles to the mine.

The U. S. Bureau of Mines mapped and sampled the property in April 1943; the results indicated 30 to 50% fluorite near the surface but no ore below 30 feet.

Production:

Small shipments were reported in 1939, 1943-45, and 1948; 60 carloads of metspar were shipped in 1953. As crushing, screening, and blending of ores from several other properties was done at the Big Spar, the reported production from here is probably in error. The owner reports that only about 1000 tons was actually produced from this mine. Jigs, tables, and screening were successfully used to concentrate the ore as the silica is all in the gangue and the fluorite is freed at approximately 3/8-inch crushing.

Occurrence:

The ore occurs in a shear zone traceable for about 1000 feet; however, only about 500 feet contains appreciable fluorite. At the northwest part of the zone the shear strikes about $\text{S}40^\circ\text{E}$ and dips 75 to 80° southwest; here ore has been mined to a shallow depth (not over 50 feet) from an inclined shaft and

Arizona
Fluorite

Big Spar Mine cont.

a narrow open cut. The shear zone is on and near a contact between granite and trachyte; the fluorite is usually associated with black calcite and quartz. Noteworthy is the presence of small diorite intrusives near the ore zone. Such intrusives are found with most fluorite occurrences found in the state.

To the southeast the shear zone strikes more easterly, being about S70°E and little fluorite is found. Large masses of trachyte-calcite breccia noted at the southeast end of the deposit seem to be associated with complimentary faulting. Such faulting noted in the northwest end of the deposit is north-south and increases the width of the breccia zone.

The claim owner feels that appreciable low grade reserves remain. Except for narrow exposures the mineralization appears to be too low grade; however, further exploration is warranted. This examination indicates that reserves may be found southeast of and near the shaft. A 2.5-foot sample taken from an old pit about 200 feet southeast of the inclined shaft contains 43% CaF_2 with low silica. Due to overburden and road interference little exploration has been done in this area. Short drifts off the shaft to the southeast were disappointing.

Conclusions:

The Big Spar has potential reserves of low grade fluorite; however, further exploration will be required to delineate these reserves. Low grade material northwest of the shaft workings is too low grade as exposed, but additional exploration may indicate a better grade. About 200 feet of shear zone southeast of the shaft has not been adequately explored; one exposure here is encouraging.

Victor E. Kral
Dec. 7, 1975

Black Mountain

Summary:

Situated about 5 miles north of Bouse this deposit has fluorite and barite mineralization that may be of future interest. Samples of veins about 2 to 3 feet thick average about 14.9% fluorite. Most favorable economic and milling facilities would be required to make this property a potential reserve.

Location:

The property is situated in the SW/NE Sec. 34 (partially surveyed) T8N, R17W at an elevation of 1000 feet and is shown on the Bouse 15' USGS topographic quadrangle. It may be reached from Bouse by traveling 3.6 miles on the Swansea road to Thompson's Well, turning left (north-west) on a bladed sandy road about 1.9 miles to a prominent black hill about 0.2 miles past an old abandoned well.

Ownership:

Two claims were located on February 3, 1975 as the Black Hills Barite by E. W. Brown of the D & J Mining Co., 4845 S. 36th Drive, Phoenix 85041. This seems to be a relocation by the same people; location work as two drill holes was done a few weeks before the property was examined.

Occurrence:

This is a barite deposit containing appreciable fluorite and is described in detail in RI 5651, pp. 62-65. The Bureau's representative sample for metallurgical purposes contained 14.1% fluorite. Our four samples average 14.9% fluorite. The workings consist of three cuts bearing northwesterly in which the two northeasterly cuts join at their northwest end. The cuts have maximum depth of about 25 feet. Our sample #1 was taken in the face of the most northeastern cut, or branch; it contains 12.3% fluorite over 2.6 feet. Sample #2 was a grab sample of the ore being slushed at the southeast end of the mid trench (southwestern of the two trenches joined at their northwest end); it contains 17.3% fluorite. Sample #3 was taken from the bottom of the southwestern trench at the southeastern edge at a 15-foot shaft; it contains 16.7% fluorite over 2.2 feet. Sample #4 was taken from a small trench on the southeast continuation of the most northeastern trench (branch); it contains 13.3% fluorite over 3.3 feet.

The small mineralized hill is largely basalt with a limestone capping intruded by diorite. The northeastern mineralization is in diorite while the southwestern cut is more or less on a contact with the diorite and basalt. The limestone is a rather thin capping on the southwest side at the hill, probably about 10 feet thick. It is not known if the diorite intrusive is post limestone or prelimestone.

Black Mountain cont'd

Occurrence:

The three trenches do not necessarily expose all the mineralization; other parallel veins were noted. All structures bear northwesterly with near vertical dips.

Conclusions:

Given proper economic conditions and nearby milling facilities for both barite and fluorite, this deposit may be of interest for further exploration. However, in the light of the usual shallow depth of fluorite mineralization and the relatively narrow one thickness here the future potential looks dismal.

Examined by William C. Hirt
and Victor E. Kral on May 7, 1975

Arizona
Fluorspar

Bluebird Mine

Summary:

The Bluebird, also known as the Packard, owned by the Tonto Mining and Milling Company is situated 5.6 miles easterly of the Tonto mill in the area of Punkin Center, Gila County, Arizona, in the SE/4 of section 9, T6N, R11E.

The steeply dipping vein, up to 7 feet in thickness, occurs in the Precambrian Apache formation regionally enclosed in Precambrian granite. The vein is opened on three levels each about 130 feet apart and has been stoped out from the intermediate level to the surface. About 15,000 tons was shipped to the Tonto mill. The lower level was not accessible at the time of the examination of May 27-29, 1975 by William C. Hirt and Victor E. Kral; however, it was later accessible and examined by Robert Goodmundson on December 18, 1975. It is reported that 8,000 to 10,000 tons of ore remains between the lower and intermediate levels; part of this is broken ore that would not pull when it was wet. As the lower level is below the creek bed, water may be a problem except in late fall and winter.

The vein is traceable about 1500 feet to the east and some ore has been mined from an open cut in the creek bottom. Considerable area between the mine and this occurrence warrants further exploration to find enough ore to augment that left above the lower level and make the mining of these remaining reserves feasible.

Location & Ownership:

The Bluebird Mine is owned by the Tonto Mining and Milling Company of Punkin Center, Arizona. It is 7.8 miles by road easterly of Punkin Center and 5.6 miles by road easterly of Tonto Mill. The property is in the NW/4, SE/4, SE/4 section 9 T6N, R11E, in Gila County, Arizona, at an elevation of about 3300 feet. It is shown on the Greenback Creek 7½ minute USGS topographic quadrangle. The road to the property was built by the Tonto company and may be travelled by ordinary passenger vehicle.

Occurrence:

The fluorspar occurs in a steeply dipping vein bearing about N20°W and traceable for about one half mile. The vein mineralization thickness is as much as 7 feet and occurs in

what appears to be arhyolite of the Precambrian Apache group. Regionally the Apache here is surrounded by Precambrian granite.

Mining was done on three levels, the upper two are adits and the lower is reached by a 310-foot inclined shaft of about 140° inclination. The vertical distance between each of the three levels is about 130 feet.

The upper adit exposes the vein for its full 280-foot length; as it ends in an open stope the western face was not examined. The entire length of the adit has been stoped to the surface wherever vein thickness was found to be 1.5 feet or more.

The lower adit (intermediate level) is about 600 feet long; from the portal it is 320 feet to the vein then the adit drifts about 270 feet on the vein. Chutes indicate that the entire length of the vein has been stoped; the face of the drift is barren of fluorspar.

The lower level is connected to the intermediate by a vertical raise which cuts the intermediate level near its face. The raise timbering does not appear to be safe. Access to the lower level was blocked by water in May of 1975, however, in December the lower level was dry. Edwards Spring is only about a half mile above the incline, the portal of which is only about 15 feet above the creek bed.

On the surface the vein can be traced westerly somewhat beyond the mined area, however, no appreciable fluorspar occurs here. To the east the vein is traceable about 1500 feet, almost to Edwards Spring. As the fault zone here is in the creek bottom, exploration is difficult, however, some trenching has been done and a small tonnage of fluorspar was mined.

Much of the area between exposures in the creek bottom and mining in the lower adit apparently has not been explored.

Reserves:

Mr. Jack Hamilton, manager of Tonto Mining and Milling Company, feels that about 8,000 to 10,000 tons of fluorspar ore is left between the lower and intermediate levels; some of this is broken in stopes and could not be pulled when the ore was wet. No other known reserves are available as the vein above the intermediate level is stoped out.

Exploration may find ore east of the mined area as several hundred feet of the vein appears to be unexplored.

Milling Facilities:

The Tonto mill is well equipped to handle the ore, having milled about 15,000 tons from here during the period of late 1972 through mid-1973. The mill is equipped with a 6 by 5-foot grate discharge Marcy ball mill in closed circuit with hydro-cones, 5 Fagergren cells and 6 Denver 21 cells; the concentrate is handled by a thickner and leaf filter from which it goes to a rotary kiln dryer. The dryer capacity is about 75 tons per day which limit determines the fluorite circuit capacity. The mill circuit uses 135 horse power.

Conclusions:

The property warrants exploration between the mined area and the creek bed. If several thousand tons of mineable and treatable ore is found, the mining of such new reserves together with the 8,000 to 10,000 tons left in the mine may be feasible; otherwise this remaining tonnage does not appear profitable.

As the ore averages about 60 to 65% CaF_2 and ran about 50% CaF_2 as mined, and haul to mill is only 5.6 miles, this is a most interesting potential reserve for the Tonto mill.

Victor E. Kral
November 28, 1975

Arizona
Fluorite

Black Dike

Summary:

This prospect is reported to have small amounts of copper and uranium, however, William C. Hirt could find no fluorite although states there may be a trace. This prospect has no fluorite mineralization of potential interest. Examined July, 1975.

Location:

The exposure appears to be in the SE/SE of Sec 23, T17S, R11E, Pima County, Arizona, and is on the Palo Alto 15' USGS topographic quadrangle.

Boriana

Summary:

This well known tungsten producer is not a potential resource of fluorite. The following from USGS Bulletin 940-I, p.254, "Fluorite of a rich purple color is the second most abundant gangue mineral, but even where it is most abundant it makes up scarcely 5% of the vein. It occurs in small lenses and pods in the quartz veins. Some short veins of pure fluorite, about 1" thick, have been noted at the borders of larger quartz veins, or even in the phyllite wall rock". The mineral fluorite is not mentioned elsewhere under mineralization.

Location:

The Boriana mine is in the SE/SE of Sec. 13, T18N, R16W, in Mohave County, Arizona. It is about 16 miles by improved road easterly from Yucca on I-40; the mine is shown on the Wabayuma 7½' USGS topographic quadrangle.

Arizona
Fluorite

Burro Barite

Summary:

This is a barite occurrence of doubtful importance containing minor fluorite of no importance. The area is well described in U.S. B.M., RI 5651, pp. 72-74, 1960. The claim was examined by William C. Hirt and Victor E. Kral on May 7, 1975.

Location:

The occurrence is in the SW/NW Sec. 29, T6N, R17W, in Yuma County. It is reached from Bouse by traveling 8.3 miles south on the Quartzite road, then westerly about a half mile, then turn off northerly and walk about 600 feet northwest to an open cut. The area is shown on the Bouse 15' USGS topographic quadrangle.

Ownership:

No evidence of ownership was found.

Occurrence:

A fault shear zone in an andesitic volcanic bears S50°W and dips 80° SE; it is exposed in a 20-foot open cut about 8 feet wide and is traceable about 500 feet. The cut exposes a 2.5 to 3-foot barite vein showing some fluorite on the hanging wall of the barite. This is the only place along about 500 feet of traceable shear zone that shows appreciable width. The mineralization here is barite, quartz and minor fluorite.

About 500 feet SE of the above exposure another 5-foot barite vein was noted striking N-S and dipping steeply west. No work had been done on this occurrence.

*COLORADO, FLORA Temple - Castle Dome
NAYAL, NE AREA, Senora - Big Dome - Promontoria
Rialto (HULL), Strong*

Arizona
Fluorite

Castle Dome District

Summary:

The Castle Dome District is largely in the SE part of T4S, R19W and the NE part of T5S, R19W. It is 43 miles by road north-east of Yuma of which all but the last 7 miles (graded) is on U. S. 95.

The district has been mined for lead and silver since 1863 as an organized mining district and probably prior to that by the Indians and/or Spanish. Fluorite has been a by-product of the lead mining since early in the century, however, production probably has not been more than about 50,000 tons.

Water for milling is a problem here, the Rialto mine made about 7,000 gallons per day in 1930 but it is reported that the water level in the mine receded by 1945. The only milling of consequence was done on the Gila River in a 100 to 150 ton gravity concentrator operated during 1942-1947 to concentrate lead ore, although it did produce about 3700 tons of rough fluorite concentrate.

The principal characteristic of the veins is their lateral persistence; some are traceable for 4000 feet, and possibly more. The host rocks are largely shale, impure limestone and schist intruded by a rhyolite porphyry and diorite porphyry. The diorite seems to be important for the presence of ore.

The Rialto mine area at the north end of the district and the Senora mine area in the central area are the best potential areas for fluorite ore, as well as fluorite bearing stope fill. Also, in the extreme southern part of the district, the Nayal Group warrants further exploration for fluorite.

Reserves as dumps, tailings and stope fill amount to about 30,000 tons with a good possibility of another 10,000 tons of stope fill in the Senora mine. The district requires further exploration to show unmined ore reserves other than those listed by the U. S. Bureau of Mines.

Should fluorite economics become such that the milling of such reserves may be a feasible venture it will be necessary that one company have the necessary leases on the entire district and be able to place a concentrator on the Gila River as was done previously.

Location and Introduction:

The Castle Dome district consists of 5 groups of patented claims, and one single, together with a very large number of unpatented claims. The district is almost entirely in one tier of sections with sec. 25, T4S, R19W at the north and sec. 13, T5S, R19W at the south. The entire district is reached from the Castle Dome mine which is 43 miles northeast of Yuma by road of which all but the last 7 miles (graded) is U.S. 95. The district is in Yuma County and is shown on the Castle Dome mountains 15 minute USGS topographic quadrangle. The area is at an elevation of about 1400 feet and is part of a large pediment just southwest of the Castle Dome mountains; the terrain is rolling to flat. The climate is arid desert and water is scarce.

The entire district is described as one unit largely because it is relatively small and the properties have similar geologic and economic characteristics, however, details of each logical group or property is described separately.

During 1942-47 the Arizona Lead Company and later the Joplin Lead Company, operated a 100 to 150-ton gravity concentrator near the McPhaul bridge on the Gila River, 26 miles by good graveled road from the district. The mill made a lead concentrate and 3700 tons of rough fluorspar concentrate from dump ore, stope fill, and some newly mined ore from the DeLuce property (Flora Temple group) and the Rialto mine. Although the rough fluorspar concentrate was shipped, the tailings were lost in later years when used as fill to construct a recreational park in the area.

The organized mining district dates to 1863, however, it is said that the early miners found old shallow workings that were a reliable guide to ore. E. D. Wilson in Arizona Zinc and Lead Deposits, Arizona Bureau of Mines Bulletin 156, pp. 98-115, describes the district in detail.

Geology:

The ore is usually in a shale or schist and sometimes in a siltstone or impure limestone intruded by a porphyritic diorite and rhyolite. The diorite porphyry is not necessarily directly associated with the ore but is almost always noted in the immediate vicinity. Frequently the intrusive makes one wall of the fluorite vein.

The single principal characteristic of the veins is their lateral persistence. Various reports state that some are traceable for 4000 feet. Although they split and branch, the veins are probably traceable for somewhat greater distances. The fluorite ore is usually less than 5 feet in thickness and more likely to average 2 to 3 feet where considered of importance. The veins usually strike about N 10° W to N 40° W and usually have a steep dip to the east in the northern part of the district and to the west in the southern part. Vein branches often have considerable difference in dip.

Production:

The district production figures are a bit hazy but it appears that about 1000 tons was shipped during and prior to World War I, about 5000 tons during World War II and about 4000 tons of fluorite in recent years. Considering the many small shipments over the long history of the district the total fluorite production appears to be about 50,000 tons.

Reserves:

Although this examination of the district did note ore exposures that may be expected to result in fluorite reserves following further exploration, these data develop no reserves other than tailings. Therefore, the only calculable reserves can be the minor tonnage of tailings left at some properties, underground reserves as stope fill and unmined ore mentioned in reports of U.S. Bureau of Mines engineers made during World War II. Except for minor shallow work, underground workings are now inaccessible.

Reserves left in the Castle Dome District are distributed approximately as follows:

Claims	Tons	% CaF ₂	Information Source	Material
Rialto group:				
Rialto mine	10,000	20-25	Bureau	stope fill
	2,000	36.5	Bureau	tails
	1,000	18	Bureau	dump
	1,000	33.6	Bureau	dump
	1,200	20	Bureau	dump
	200	50	est.	CaF ₂ conc.
S of Rialto mine	1,000	20	est.	dump
S of Rialto mine	300	20	est.	tails
S of Rialto mine	1,000	15	est.	dump
Soprise	500	25	est.	dump
Lucinda	200	25	est.	dump
Total	18,400		Rialto group	
Mable:	400	15	est.	tails
Senora group:				
Big Dome	500	31.5	Bureau	dump
Big Dome	10,000	31.5	Bureau est.	stope fill
Senora	200	20	est.	tails
Senora	200	20	est.	dump
Promontorio	50	35	est.	dump
Total	10,950		Senora group	
Grand Total	29,750 tons			

The Flora Temple tailings estimated at about 6,000 tons were sampled but contain only 8.0% CaF_2 , therefore, are not included.

Claim Group Details

Rialto (Hull) group:

This group consists of nine patented claims: Chief of the Dome, Hull Nos. 2-3-4, Diana, Berkley, Soprise, Lorina and Lucinda owned by M. W. Stock & Peter Marston, box 176, Pine Valley, CA, 92062. It is understood that the property is being sold to G&S Minerals of the same address. The property is situated at the north end of the district and apparently has the deepest workings. A cross-section of part of the workings indicates that the vein had been explored about 700 feet laterally to a depth of 370 feet. It is estimated that about 60% or more of the vein had been stoped and most of the stopes were back-filled. It is assumed that much of this fill was removed by the Arizona Lead Company. Over 2000 feet of this vein has been explored by underground work from several shafts and the better ore has been removed. Although narrower, the vein at the south end of the workings, on the Soprise claim, appears to have potential and warrants more exploration.

The lower workings make water and in 1930 about 6,000 to 7,000 gallons per day was obtained from a depth of 225 to 275 feet. In some seasons the flow was much greater but E. D. Wilson reports that the water later receded and in 1945 was below the principal workings.

The principal hostrock here is a very fine grained shale, being schistose in some areas. The dumps indicate much diorite porphyry in the underground workings.

Several parallel veins were noted on the Lorina and Lucinda claims. Particularly noteworthy is a vein exposed by two shafts on the Lucinda about 1000 feet apart. About 8 inches to 1.5 feet of almost pure fluorite is exposed, the dumps also contain some galena. This same vein appears to continue S 17° E over 1000 feet under the overburden to workings on unpatented claims to the south.

Flora Temple-Castle Dome Group:

This group of three patented claims is owned by Robert DeLuce & Vallejo Theater, Box 32005, Los Angeles, Ca., 90032; it consists of Flora Temple, First Northern Extension of Flora Temple and Castle Dome. The three are narrow 200-foot wide claims common prior to the law of 1872. Other unpatented claims surround the patents, however, they are not now identified. The claims are on and near the E-W section line between sections 25 and 36, T4S, R19W. At least three parallel veins and possibly more are noted here, all strike about N 15° W to N 30° W and dip steeply both E and W. They are the Flora Temple vein, about 200 feet east the Buckeye

vein, and about 300 feet east what seems to be the northern extension of the Big Dome vein. It appears, that these veins have several splits and are connected.

The dumps of the extensive but inaccessible workings of the Flora Temple and Buckeye veins show galena, anglesite and cerussite but little fluorite. The host rock is largely diorite porphyry with some schist.

About 6000 tons of tailings were sampled but contain only 8.0% CaF_2 .

Lyman Wall of Yuma intermittantly operates a small mill adjacent to the Flora Temple. Mill feed is usually obtained by various means of sorting dumps in the district. Water is usually obtained from several small catch basin cisterns.

Little encouragement for fluorite was noted in this group. It appears that the explored veins are worked out and others are just too small to be of interest.

Strong Claims:

This is an area largely in the SW $\frac{1}{4}$ of Section 31, T4S, R18W (partly surveyed). The claims here are all unpatented and seem to be owned principally by Beryl Strong of Yuma, Az. Included in this group are the old Mabel and Puzzler mines.

The many small veins noted here containing minor lead mineralization with traces of fluorite. It appears that the small production has been largely from pockets in the veins. The mineralization strikes N to N 30° W and dips are nearly vertical, some east and some west.

E. D. Wilson obtained information indicating that the Mabel workings are rather extensive. The Mabel shaft is 324 feet deep and in 1930 water stood at 314 feet. Most of the work was off the shaft to the south on an 11-inch lead stringer that feathered out. Other shafts on the Mabel claims are 380, 60, 50 and 49 feet deep. A mill was operated at the Mabel mine and the tailings contain appreciable fluorite. No equipment is now on the property.

In the vicinity of the Puzzler mine, about one half mile southeast of the Mabel, and in the area between, are several small veins of minor importance for lead but carrying unimportant amounts of fluorite. Strong has erected a small gravity concentrator for lead near the Puzzler.

The host rocks here are the usual shale, sometimes schistose, a rhyolite porphyry, and the diorite porphyry.

This area has little interest as a potential source of fluorite.

Northeastern Area:

This is a small area of unpatented claims largely in the extreme NW $\frac{1}{4}$ of Section 31, T4S, R18W. One claim notice by Douglas Hott of Martinez Lake, Az, was noted and it is understood that Lyman Wall of Yuma, Az, also has claims in this area.

Of the many adits and shafts in the area most show almost no fluorite and very little lead mineralization. However, the south-westerly workings consisting principally of two adits into a sharp ridge and several shallow shafts trace a vein several hundred feet. This vein contains minor fluorite and the dumps here have been carefully sorted indicating a fair lead content. The mineralization is principally on a contact of diorite porphyry on the east with schist on the west.

Although the map of the district indicates that this may be a continuation of the Rialto vein to the northwest, the fluorite here is of little importance.

Senora-Big Dome-Promontorio Group:

The claims here grouped consist of three patents and several old unpatented claims. The three patents, Promontorio, Stone Wall, and Union are owned by Phinoclad Modest: of 5921 Isleta Blvd. Albuquerque, N. M., 87105. It is understood that they are under contract to G&S Minerals Corp., Box 176, Pine Valley, Ca., 92062. The unpatented claims are re-locations of the old Senora, Big Dome, and Little Dome claims, present names are not known. The only ownership known is that of the relocation of the Big Dome by Beryl Strong of Yuma, Az. The group is in the SE $\frac{1}{4}$, Section 36, T4S, R19W and the NE $\frac{1}{4}$, Section 1, T5S, R19W.

Several more or less parallel veins are noted here striking from N 5° W to about N 40° W and usually dipping to the east at 50° to vertical. Shear zones and veins are as much as 4 feet containing fluorite to 2-foot thickness. Few exposures are this good, however, persistent fluorite mineralization is common. The Big Dome adit exposes one of the best fluorite veins in the district which is also one of the most persistent veins. This vein is traceable for at least 1600 feet and possibly for almost a mile. It appears to be connected with the Buckeye vein by various splits between the Big Dome and Castle Dome claims. In face of the Big Dome adit the vein contains 15 inches of nearly pure fluorite over a thickness of 18 inches. A sample at the adit portal contains 57.1% CaF₂ in a 2.5-foot shear zone.

The host rocks here are shale and schist intruded by rhyolite and diorite porphyry.

This group probably contains the best fluorite mineralization in the district; it at least has the best exposures now accessible. It is reported that the Big Dome probably has about 10,000 tons

of stope fill underground and it may be assumed that a similar tonnage of like stope fill is also in the old Senora workings.

Colorada Group:

This group of six patented claims, Great Hope, Amarilla, Plateada, Colorada, Morada, and Lead Mountain are owned by Phinoclade Modesti (see Senora, etc. Group for address). The group is in the E $\frac{1}{2}$ Section 12, T5S, R19W.

Mineralization here is in a very fine grained meta-sediment that may be a siltstone, schist, and diorite porphyry. The best fluorite noted was about 6 inches thick. Dumps show some lead minerals. The veins and shears strike about N 10° W to N 30° W and dip 40° to 60° W. Barite appears to be a more common gangue mineral here.

The mineralization here is of no interest for fluorite, however, lead seems to be prevalent but not in abundance.

Nayal Group:

This group of four patents and one or more unpatented claims is in the W $\frac{1}{2}$ Section 13, T5S, R19W. The patents, Nayal, El Napal, Piedad, and La Recompensa are owned by Phinoclade Modesti (see Senora, etc. Group for address). The Black Hawk and possibly other unpatented claims are owned by Beryl Strong of Yuma, AZ.

A vein on the Black Hawk strikes N 30° E and dips 45° NW; small cuts on this open one exposure of 26 inches containing about 40% CaF₂. Elsewhere on this same structure the dump of an inclined shaft shows only a trace of fluorite.

The Nayal has an inclined shaft on a vein striking N 15° W and dipping 30° SW. A 4-foot sample here contains 34.7% CaF₂.

Another fluorite exposure, not examined, is about one half mile southeast and reported to have had a small shipment of fluorite in recent years.

The host rocks here are meta-siltstone and diorite porphyry. Barite is more common than in the northern part of the district.

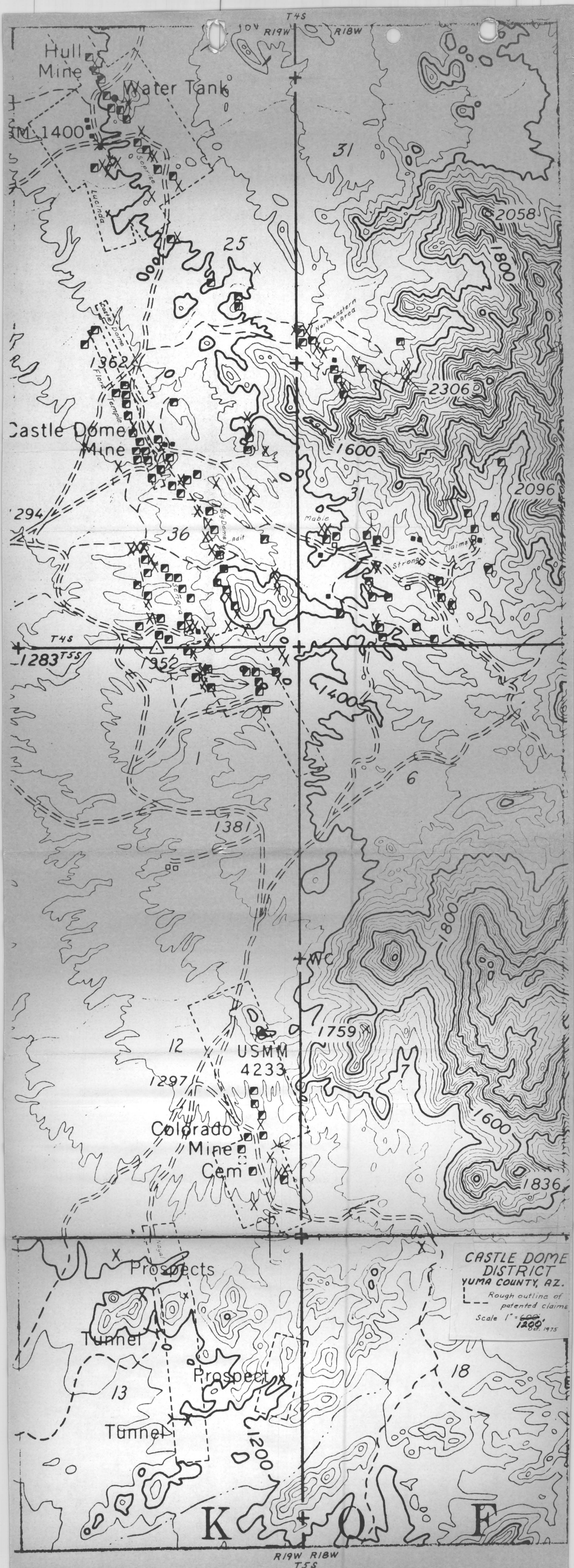
This area warrants further exploration for fluorite.

Conclusion:

The Castle Dome area has at least 30,000 tons of fluorite reserves principally in the form of stope fill, dumps and tailings and probably about 10,000 tons more fill in stopes of the Senora. Should the need for fluorite become acute, these fills may be pulled (at considerable effort and expense) and augmented by dumps and tailings now available and new ore anticipated to become available.

Much of the district warrants further exploration. Fluorite production here is predicated upon the entire district being available for lease to whatever company feels they can handle the venture when fluorite economics warrant such a venture.

Victor E. Kral
Oct. 28, 1975



Chisholm, Sr. Shaft

Summary:

This prospect is about 22 miles southwest of Aguila by fair county and desert roads. The fluorite exposures of 3.5 to 4 feet, 40 feet apart contain about 40% CaF_2 . Dozer trenching to the east has poor mineralization. Improved economics for fluorite ore in this area would warrant further exploration. The deposit was examined by William C. Hirt and Victor E. Kral on April 30, 1975.

Location:

A 20-foot shaft, reportedly sunk by the father of the present locator, is in the NE/SW, Sec. 32, T5N, R10W, Maricopa County, Arizona. The shaft appears on the Lone Mountain 15' USGS topographic quadrangle and is W-NW of the Alaska Mine. The prospect is reached from Aguila by taking the Eagle Eye road southwesterly 19.4 miles, then turning westerly and northwesterly on a road, 2.7 miles to the shaft at the edge of a wash.

Ownership:

This is part of a large group of claims staked by Chisholm over a distance of several miles.

Occurrence:

The shaft exposes a 3.5-foot shear zone that bears west and dips 75° N on a contact between hornfels and diorite. The shear is also exposed on the west side of the wash about 40 feet west of the shaft where a 4-foot sample contains 42.4% CaF_2 . It is estimated that the exposure in the shaft is of approximately similar grade. The shear zone is also exposed in a long dozer cut about 250 feet east of the shaft, however, only minor fluorite is found here.

Conclusion:

Should fluorite become more economically interesting in this area by higher price as well as milling facilities, this property is worthy of further exploration.

Victor E. Kral
July 1975

Contact, Maricopa County, Arizona

Summary:

The Contact fluorite deposit is about $5\frac{1}{2}$ miles airline south of Wickenburg in the SW $\frac{1}{4}$ /NE $\frac{1}{4}$ Section 1, T6N, R5W, Maricopa County, Arizona. It is owned by J. D. Campbell of Wickenburg who reports to have shipped about 200 tons of fluorite ore from the property.

Minor shallow workings are on and near a ridge at about 2700 feet elevation in andesite with some small diorite intrusions. The fluorite occurs in veins and shear zones 1.0 to 2.6 feet in width. It is difficult to understand how production from here could be profitable. The property was examined by Victor E. Kral and William C. Hirt on May 5, 1975.

Location:

The Contact deposit is in the SW $\frac{1}{4}$ /NE $\frac{1}{4}$ Section 1, T6N, R5W, about 5 airline miles south of Wickenburg, Maricopa County, Arizona. It is shown on the Wickenburg 7 $\frac{1}{2}$ minute U. S. G. S. topographic quadrangle as a minor excavation, or prospect. The property is reached from the Big Spar by travelling northeasterly 0.4 mile on the old Wickenburg road, then turn southeasterly down a wash for 2.7 miles just past a windmill on the north side of the wash, then follow a jeep trail northeasterly about a mile to the property.

Ownership:

J. D. Campbell, Wickenburg, Arizona.

Production:

The owner reports about 200 tons production.

Physical Features:

The minor workings are at an elevation of 2600 to 2700 feet; vegetation is the usual desert growth.

Geology and Exploration:

The host rock is a very fine grained gray andesite often containing fine grained pyrite crystals. Several exposures of diorite intruding the andesite were noted. Fluorite exposures were found in three places; an open cut about 20 feet long exposing an east-west 2-foot shear zone containing minor fluorite is indicated on the topographic quadrangle. About 200 feet east

of this cut, apparently on the same trend, is a 20-foot cut adjacent to a small 15-foot depth stope on the ridge. A 1.0-foot sample of the vein here contains 81.9% CaF_2 . About 800 feet southeasterly along the ridge and down somewhat on the southwest side two small cuts expose a 2.6-foot vein of fluorite which contains 66.4% CaF_2 .

Conclusions:

Notwithstanding the production, the poor access and size of this occurrence makes it difficult to imagine profitable mining from here.

Victor E. Kral
September 1975

Coronado

Summary:

The Coronado claim group was not visited; however, they are described in RI 5651 (Barite). The barite is found chiefly in the dump material of the lead and copper workings and contains small amounts of fluorspar.

Location:

The Coronado group of claims was located in 1954 by the Coronado Development Co., of Farmington, New Mexico, in the vicinity of the North Star shaft of the Copper Reef Consolidated Mines. The barite occurrences are in sec.'s 28 and 29, T4S, R19E, Graham Co., Arizona. The Bureau gives the following road log:

- 0. Globe. Travel east from the junction of US 60 & 70.
- 32.2 Turn south on a graded road, signed Hawk Canyon, at a point 6.8 miles east of Coolidge Dam.
- 36.3 Branch right.
- 39.1 Keep right on a poor dirt road.
- 41.7 Arrive at old North Star shaft.

The workings are on the San Carlos Reservoir 15' USGS topographic quadrangle.

Jan Carol Wilt
July 1975

0009
File

FLUORINE HILL MINE

Summary

Rhyolite porphyry is the host rock for fluorite mineralization. In most of the outcrops the fluorite zone is not traceable for an appreciable distance along strike, because post-mineral movement has destroyed the continuity of the vein.

However, there is potential for ore in several places on the property, such as in the underground tunnel where a 3 foot vein of about 50% CaF_2 is exposed. Past bulldozer cuts have produced much loose material that has been piled up haphazardly on the outcrops. Drilling or better bulldozer work would give a better idea of the extent of the fluorite reserves.

The property was examined on Feb. 27, 1975, March 3-4, 7, and 8, by John Earl, William Hirt, and Glen Walker.

Location

The mine is located in the $\text{E}\frac{1}{2}$ /NE/SW of Sec. 35, T17S, R25E, in Cochise County, Arizona. The nearest town is Pearce, Arizona, 3 miles west.

Physical Features

The area around the mine is flat desert rangeland broken by several hills composed of volcanic rock, upon one of which the mine is situated. The annual precipitation at Pearce is 14.16 inches. An adequate water supply could probably be obtained from wells within 1-2 miles of the mine. The town of Pearce is the nearest source of electricity. A good dirt road about half a mile long connects the mine with U. S. Highway 666.

History

The mine has been leased and operated by several concerns, but production has been sporadic and probably unprofitable. It is now inactive.

Ownership

The ownership of the mine now rests with the Cartmell brothers, Ralph and Bud, of Pearce, Arizona.

Geology

Rhyolite porphyry is the country rock for the mineralization, which occurs in a NW-SE trending shear zone. Many small veins of fluorite diluted to varying degree with rhyolite are found. These veins are usually 1-3 feet wide and cannot be traced for more than 10-40 feet on the surface, although indications are that in the trenches and open cuts the veins may have been more extensive. Much of the fluorite is in irregular blebs and lenticular forms, and is in brecciated or rounded form with iron staining characteristic.

Post-mineral movement along shears and faults has broken up a large part of the original fluorite and diluted it with waste rock to the point where it would not be economic to mine. The movement has so deformed the rhyolite in the central and western parts of the mine area that the rock is foliated in close-spaced layers about 1/8 inch thick. However, some of the deposit has escaped this fragmentation and in several places may be mineable, as in the underground tunnel where a vein up to 3 feet wide can be traced for 50 feet. At the end of one trench is an 8 feet CaF_2 vein, which unfortunately does not continue for more than about 30 feet.

To the east of the main fluorspar vein outcroppings is a shaft where some carnotite staining is evident along with minor purple fluorite. Gold is reported to have been produced here. Also some gold and silver is believed to have been produced from the western workings on the property.

Green and purple are the usual colors of the fluorite. The main gangue material is rhyolite country rock with some quartz.

Development

The property has seen numerous excavations, some of which are now filled in because of an overambitious bulldozing program. Many small pits and trenches have been made; three large trenches 50-200 feet long were opened up along the vein. Three shafts from 40 to 200 feet deep remain, but were not examined because of their unsafe condition.

An inclined shaft or adit approximately 50 feet long and inclined 23° is open, and was mapped and sampled.

The area of the main fluorite outcrops has been bulldozed to such an extent that the geology is much obscured by the disturbed rock.

Sampling

Chip samples of the vein were cut ^{across} along outcrops on the surface, and in trenches and underground workings. The samples are located by number on the map and the analyses are shown below.

<u>Sample No.</u>	<u>Sample Description</u>	<u>% CaF₂</u>	<u>% SiO₂</u>
1	6" outcrop	54.66	13.28
2	54" sample of outcrop 5' east of cut	47.11	
3	6" sample 15' east of cut	45.64	6.72
4	24" sample 18' west of face of cut	50.71	10.44
5	25" sample in face	49.52	12.14
6	8' sample in face	51.47	14.52
7	grab sample every 10'	16.25	15.88
8	33" sample in face	48.82	2.56
9	13" sample 10' from face	66.50	0.52
10	12" sample 20' from face	35.83	48.92
11	12" sample 40' from face	60.99	2.52

Although one or two of these samples could be considered to be of "met spar" grade, it is quite likely that beneficiation would be necessary to make a marketable product. Possibly the vein in the inclined adit or shaft may widen at depth and maintain its high grade.

William Hirt
June, 1975

Fluorine Hill Mine - Page 4

This property consists of 10 unpatented claims recorded as the Blue Jeep #1 thru #9 and the Brindle Cove in docket 317 pages 288 to 311 in the Cochise County Records Office, Bisbee, Arizona by Ralph Cartmell, Pearce, Arizona

It is located in section 35, T17s, R25e adn is shown of USGS 15 minute topographic map, Pearce, Arizona. This map indicates the elevation as 4480 feet and the location 109° 48'12" Longitude, 31° 54'35" Latitude.

The property can be reached from Pearce, Arizona by traveling east 3-1/2 miles on U. S. Highway 660 to a gate on the left or north side, thence thru the gate 1/2 mile.

The mine has had only a very limited production of less than 20 tons.

Arizona Fluorspar

MAS Project

Field work was started about February 1975 and continued throughout the year. Reports were written on 57 properties. In some cases of barite-fluorspar occurrences the available U.S. Bureau of Mines data were considered adequate and the properties were not re-examined. In other cases examinations found reported fluorspar occurrences to be non existant and no reports were written. The following table summarizes the report coverage.

County	Mng. District	Reports	MAS Code		Reference No. on map
			(L)	(C)	
Cochise	Cochise	2	2		1
	Pearce	1	1		2
	Swisshelm	1	1		3
	Whetstone	1	1		4
Gila	Fluorine	1		1	5
	Rye	1	1		6
	Tonto Basin	3	3		7
Graham	Aravaipa	6	6		8
Greenlee	Duncan	5	5		9
Maricopa	Ellsworth	6	5	1	10
	Granite Mtn.	1	1		11
	Painted Rock Mts.	1	1		12
	Vulture	4	4		13
Mohave	Cedar Valley	1	1		14
Pima	Empire	1	1		15
	Horseshoe Basin	1	1		16
	Reddington	1	1		17
	Sierrita	2	2		18
Pinal	Mineral Hill	1	1		19
Santa Cruz	Harshaw	1	1		20
	Oro Blanco	1	1		21
Yuma	Bouse	6	6		22
	Castle Dome	7	5	2	23
	Silver	1	1		24
	Swansea	1	1		25
		57	53	4	

Arizona Fluorspar by E.A. Elevatorski Oct. 1971, printed by the Arizona Department of Mineral Resources was used a guide. These data were supplemented by information from various Arizona Bureau of Mines publications, Department of Mineral Resources files, and suggestions from people in the mineral industry.

As minor occurrences of fluorite, having no commercial potential are common in Arizona much time was spent examining such occurrences and making negative reports. Regardless, the results on many deposits of minor potential does suggest areas that warrant further exploration and may become future producers.

The State of Arizona has widespread fluorspar mineralization, but few deposits even approaching mineable grade and quantity. Only one deposit, the Jerky group, in Gila County, has definite potential as a substantial reserve.

The following table gives a rough idea of production and potential in the state:

<u>County</u>	<u>District</u>	<u>Production</u>	<u>Estimated Reserves</u>
Cochise	Whetstone	20,000	
Gila	Tonto Basin Fluorine	19,000	300,000
Greenlee	Duncan	6,000	
Maricopa	Ellsworth Vulture	200 5,000	7,000 10,000
Pima	Sierrita	100	
Yuma	Bouse Castle Dome		11,200 50,000
		50,000	
		100,000 tons	378,000 tons

Several of the above figures are weak; Castle Dome production, relatively well verified, is only about 10,000 tons, however, the districts production over long periods of poor or non-existent records makes 50,000 tons total, a reasonable guess. The 10,000 tons reserve shown for the Vulture district is a guess-estimate; the owner estimates 90,000 tons of low grade, which seems unrealistic.

Two steps are important to the future of fluorspar in Arizona. First, it is necessary to have concentrating facilities in districts having minor reserves. In most areas this is quite risky even if most properties are tied up to process their ore in such concentrators. The Tonto Basin mill in Gila County is an example of a facility allowing production from three properties which

5' deep
3' deep

Steel Tanks

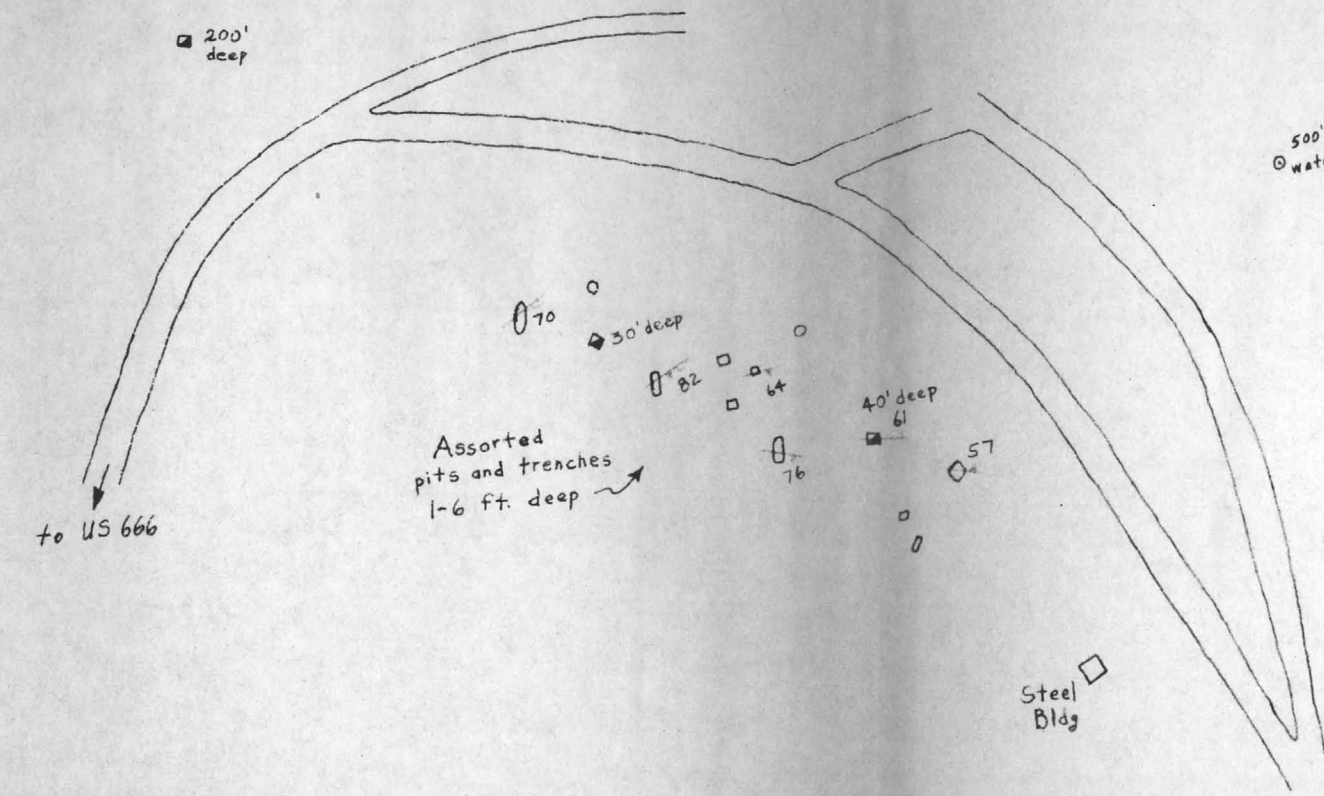
5' deep
8' deep
20' deep in
brecc. rhy.,
brecc. CaF₂

2" P.H.

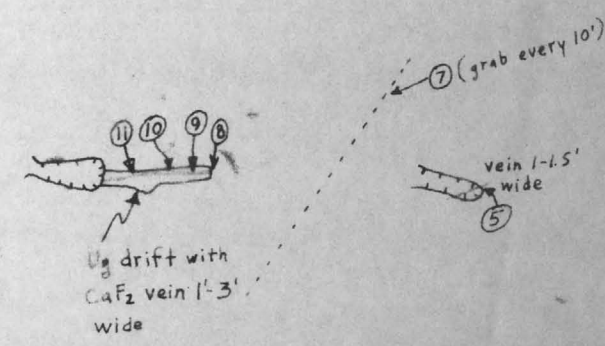
6' dp
fol. rhy
unfd. rhy

200' deep

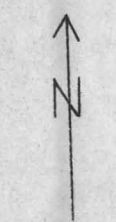
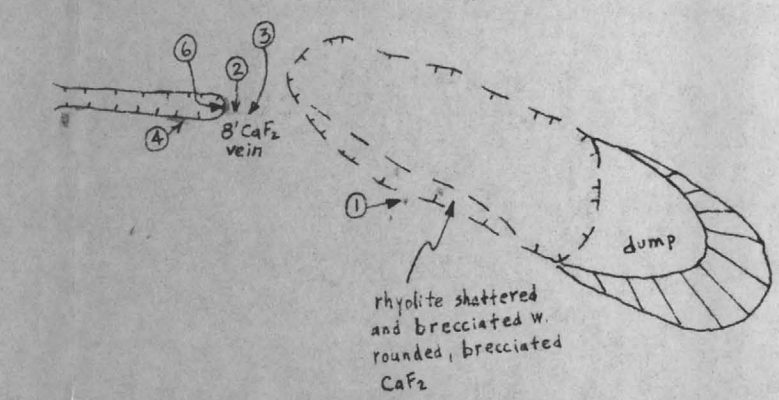
500' deep
water at bottom



1 ft deep
6' deep
Water Storage Pond



veins 1'-2' wide,
brecc. CaF₂ in silic. rhy.

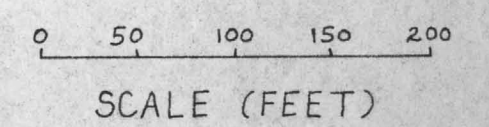


volcanic
breccia pipe

3' deep
4' deep

dump w. yellow U staining,
minor CaF₂

FLUORINE HILL MINE
COCHISE COUNTY, ARIZ.
S 1/2, SEC. 35, T17S, R25E
3-31-75
WCH



- LITHOLOGY
- RHYOLITE
 - TUFF
 - VOLCANIC BRECCIA
 - FLUORITE

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

Fourth of July Mine

C
O
P
Y
LOCATION: The Fourth of July Mine is located in the Steeple Rock mining district in the western foothills of the Mule Creek Mountains, about 20 miles northeast of Duncan. The mine shaft is shown on the York Valley, Ariz.-N. Mexico 15 minute quadrangel in T. 7 S., R. 32 E., Sec. 4, NW $\frac{1}{4}$, NE $\frac{1}{4}$, NE $\frac{1}{4}$. According to the geologic map of the Fourth of July Mine in Trace's 1947 report, the northernmost open cut, approximately 200 feet northeast of the Ellis Shaft, is located in T. 6 S., R. 32 E., Sec. 33, SW $\frac{1}{4}$, SE $\frac{1}{4}$, SW $\frac{1}{4}$, SE $\frac{1}{4}$. The mine shaft on the topographic map is at approximately 4640 feet elevation (1383 meters) and is located at 32.86036° (32° 51' 37.3") North latitude and 109.07528° (109° 4' 31.01") West longitude.

The Fourth of July Mine can be reached from Duncan by driving northwest on Arizona Highway 75 for 2 miles from the Ariz. 75 - U. S. 70 junction. Turn right through a gate in the highway fence and drive 8 $\frac{1}{2}$ miles northeast on a well-maintained gravel road to Goat Camp Spring. Turn left (northwest) on the jeep road for about 5 miles (about 2 miles past the Polly Ann Mine); then turn right (northeast) up a wash (probably Sanders Wash which branches into Daniels Camp Canyon) which becomes a jeep road to Daniels Camp mine. Daniels Camp Mine is about 2 miles along this road and the Fourth of July Mine is $\frac{3}{4}$ mile beyond Daniels Camp and is at the end of the road.

The Fourth of July Mine can also be reached from Duncan by driving northwest on Arizona Highway 75 for 10.5 miles from the Ariz. 75 - U. S. 70 junction. Drive northeast on a dirt road along Sanders Wash for 4 miles to a fork in the road. (The right fork leads ^{east} to the Polly Ann Mine in 2 $\frac{1}{2}$ miles.) Take the left fork to the northeast for about 3 miles and the Fourth of July Mine is at the end of the road, about $\frac{3}{4}$ mile east of Daniels Camp mine.

HISTORY: Mining on the Fourth of July vein started in January, 1937, and continued intermittently until August, 1942. The mine was originally owned by Robert T. Ellis of Duncan. In 1939 production was reported to be 150 tons per month. Between 1937 and 1941 the mine is reported to have produced approximately 2600 tons of fluor spar containing 65% CaF_2 and 25 to 30 % SiO_2 .

In 1942 Mr. Ellis took A. T. Laine of Fresno, California, as a partner in the mine. At this time production was given as 500 tons of milling ore for the previous year (1941). In 1942 about 1600 tons containing 60 to 65% CaF_2 and 25 to 30% SiO_2 were shipped. The only available mill records indicate that between January 1 and August 18, 1942, a total of 573 tons of fluor spar containing 64% CaF_2 was shipped from the Fourth of July claim no. 2. In 1944 the property was controlled by the R.T. Ellis Mining Co. of Duncan.

A 1952 report indicates that the mine was acquired by Ben Billingsley of Duncan and Roy B. Wilson of Phoenix with Arizona Eastern Fluorspar Corp. of Duncan operating the mine with an option to purchase, which they did in 1953. The ownership reverted to Ben Billingsley in 1954 or 1955.

OWNERSHIP: The Fourth of July Mine is currently owned by Ben Billingsley of Duncan, Arizona, and is recorded as two claims, the Fourth of July and the Fourth of July No. 2, in book 16, pages 569 and 570 in the Greenlee County Records Office, Clifton, Arizona. The property is leased by Producers Minerals Co. of Safford, Arizona, with Ralph Morrow as manager.

GEOLOGY: The predominant igneous rock of the area is a reddish-brown or greenish-gray olivine basalt of Tertiary or Quaternary age, which is generally porphyritic and in places vesicular. The vesicles are in many places lined with drusy quartz or calcite. Small veinlets of quartz and calcite as much as one-eighth inch thick are scattered without recognizable pattern through the basalt. A thin section by the U. S. G. S. showed that the ferromagnesian minerals are altered to iron oxide and a carbonate of dolomitic composition. The structure and conspicuous images of olivine crystals indicate that the rock was olivine basalt.

Near the north end of claim No. 1, an undulating contact between two basalt flows is exposed. The upper flow is dark red, and the lower is dark greenish gray. Both flows are slightly vesicular, and the vesicles parallel the curve of the flow contact. Some of the basalt is well jointed in at least two directions, approximately north and east.

A bed of very light gray, fine-grained, rhyolitic tuff dipping about 24° North crops out in the southwest corner of claim No. 2. A thin section by the U.S.G.S. of the rhyolitic tuff shows that it had been devitrified. The presence of chessboard albite suggests that the tuff has been hydrothermally altered.

On the surface, evidence of movement along the faults occupied by the fluor spar veins is slight. A boulder of slickensided basalt was found near the north end of claim No. 1. Underground, however, the basalt and the veins are considerably brecciated, although positive information about the direction of movement or the amount of displacement is lacking.

FLUORSPAR DEPOSITS: The fluor spar veins contain dense milky and reddish-brown quartz, medium-gray, coarsely crystalline calcite, and green fluorite, named in order of decreasing abundance. Secondary coatings and thin stringers of

psilomelane containing 44.9% of manganese and .89% tungstic oxide are also associated with the fluorspar veins.

The fluorspar is chiefly an intimate mixture of dense milky quartz and green, fine-to coarse-grained fluorite. After long exposure to light, the fluorite loses its color. Most of the fluorspar is interlaced with a network or reddish-brown, iron-stained quartz veinlets. Calcite commonly is concentrated near the hanging-wall edge of the vein.

The fluorspar is found as lenticular veins and pockets along fault-breccia zones and fissures in basalt. The dips of the veins range between 60° and 80°. Much of the fluorspar is brecciated, indicating post-mineralization movement along the faults. The basalt between the East and West veins is slightly brecciated in places and contains many stringers of quartz.

The distribution of fluorite, quartz, and calcite within the veins is not uniform. Calcite, however, commonly occurs near the hanging wall; this relation is shown in the mine by a rather continuous cavity near the hanging wall, where calcite apparently has been leached from the vein. Commonly the fluorspar-rich part of the vein is a mixture of brecciated quartz and fluorite. Locally, however, definite sequences were noted. A small pit of the surface, for example, contains from west to east: fluorite, calcite, quartz, and calcite. On the 102-foot level, a local sequence from west to east is: quartz, calcite, fluorite, and quartz.

The vein system has a length of at least 2,500 feet, but only small sections are known to contain fluorspar. The width of the fluorspar ranges from less than an inch to approximately 5 feet, and averages 3 to 4 feet in the mine. The surface and underground exposures of fluorspar are shown on maps in Trace's 1947 report. At the south end of claim No. 1, a section of the vein about 400 feet along the strike may contain commercial deposits. On

FOURTH OF JULY MINE

the surface, the other veins on claim No. 1 are composed mostly of calcite and quartz. On claim No. 2, a section of the vein about 400 feet along the strike has economic widths of fluorspar, and the underground work has been done in this part of the vein.

DEVELOPMENT: The maps and cross-sections in Trace's 1947 report show that the Fourth of July Mine is developed on two veins approximately 25 to 30 feet apart near the center of claim No. 2. The east vein has been developed from north to south with two long trenches about 60 to 70 feet long and 60 feet deep, (Hirt) a pit that was about 20 feet deep, and a large glory hole about 20 feet in diameter that connects with the underground workings. The west vein has been developed from north to south with a small pit, a large glory hole about 15 feet deep, a pit, and the Ellis shaft at the south end. The Ellis shaft is inclined about 80° from the vertical (S. 60° W., dipping 82°) in the cross-section and is about 150 feet deep with 45 foot long crosscut to the east vein at the 57-foot level, 102-foot level, and 148-foot level. Stopes were extended upward from these levels in order to mine out the east vein. The 57-foot level was extended about 60 feet along the east vein; the 102-foot level was extended about 100 feet along the vein; and the 148-foot level was extended about 50 feet along the vein.

According to a 1952 report the west vein had been developed for a length of 120 feet and to a depth of 150 feet. The east vein had been developed for a length of 250 feet and to a depth of 50 feet.

The current (1975) investigation was not able to examine these workings because access was denied by MESA because of safety reasons.

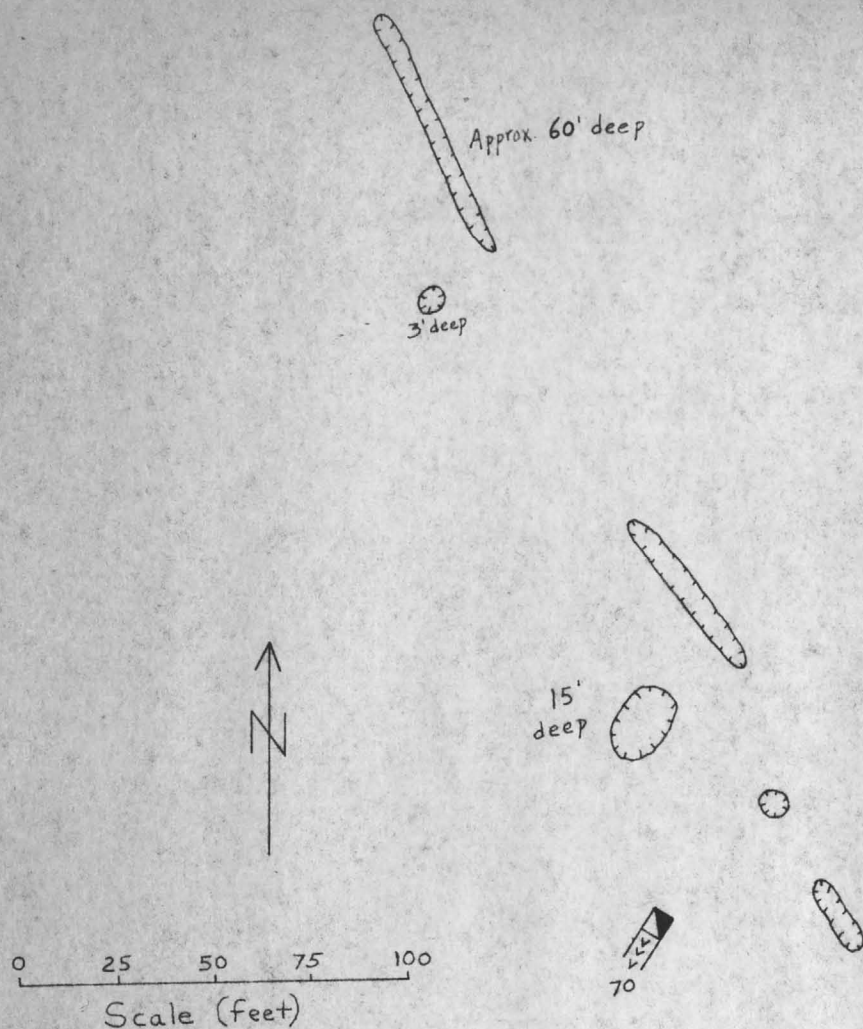
The west vein in the Ellis shaft, between the surface and the 57-foot level, dips about 60° West, and this part of the shaft was sunk in fluospar. Below the 57-foot level, the shaft steepens to 80° or 85° and is mostly in quartz.

The east vein has been mined more than the west vein. A comparison of

Fourth of July Mine

the fluorspar widths on the 102-and 148-foot levels of the east vein indicates that the fluorspar body possibly is pinching downward. Much fluorspar, however, remained in the mine in 1944, particularly between the 57-and 102-foot levels. In the south end of the 102-foot level the vein splits, the wider vein turning gently eastward into the wall. In the north end of this level the vein also splits, one part bearing almost directly north and the other west-northwest. On the 148-foot level in the northwest end of the drift, the vein divides as it did on the level above. The west branch apparently contains more fluorspar.

Maps and cross-sections of the underground workings are included in the 1947 U.S.G.S. report by Trace. They show the fluorspar ranged from 25% to 86%, but the average grade shipped was 65%. The Fourth of July mine is one of the four largest producers in the district.



FOURTH OF JULY MINE

GREENLEE COUNTY, ARIZ.

NE 1/4 SEC. 4, T7S, R32E

3-28-75

WCH

Vein with
 CaF_2

Arizona
Fluorite

Gonzales Pass

Summary:

This group of five unpatented claims was not visited as it is briefly described in RI 5651 (Barite). The barite occurs with minor amounts of fluorite in a vein that is 300 feet long and exposes a width of 3 feet of barite in places. The property is not considered to have potential economic fluorite value.

Location:

The Gonzales Pass property is presumably in sections 16 and 17, T2S, R11E, Pinal Co., Arizona. The Bureau gives the following road log:

- 0. Florence Junction. Drive east on US Highway 60 & 70.
- 4.9 Turn southeast on a truck trail.
- 7.1 Arrive at property.

The topography of the area is shown on the Pickett Post Mountain 7½' USGS topographic quadrangle. The claims, which were located in the early 1950's by J. W. Barnett, are more recent than the map.

Occurrence:

The barite, with minor amounts of fluorspar, occurs in a vein that strikes S30°E and dips 75°NE; the vein follows a fault fracture in the Pinal Schist. The vein extensions are covered by dump material in one direction and by alluvium in the other.

Jan Carol Wilt
July 1975

Arizona
Fluorite

Graham

Summary:

The Graham claim was not visited, but is described in detail in RI 5651 (Barite). The location pit exposes barite mineralization 12 to 16 inches wide with fluorspar occurring sparingly in the interstices between barite crystals. A representative sample taken by the Bureau assayed 77.8% barite and 4.9% fluorite. The property is possibly an extension of the Marcotte fracture system and is not considered to have potential economic fluorite value.

Location:

The Graham claim is in sec. 20, T8S, R22E, Graham Co., Arizona, at an altitude of over 4900 feet and is about 2 miles southeast of the Marcotte property. The Bureau gives the following road log:

- 0. Turn southwest on the Klondyke or Bonita road 6.4 miles west of Pima.
 - 17.6 Turn left (south) on the Cedar Camp Road.
 - 19.5 Pass through gate and turn left.
 - 25.8 Keep straight ahead.
 - 26.0 Turn left (right fork goes to Marcotte claims).
 - 28.4 Turn right and go down wash (passing a windmill on the east bank).
 - 29.0 Arrive at the property.
- The area is on the Sierra Bonita Ranch 15' USGS topographic quadrangle.

Occurrence:

The barite vein, which strikes N30°W and dips 75°NE, occurs in a fracture in coarse-grained granite.

Jan Carol Wilt
July 1975

Grand Reef

Summary:

The Grand Reef mine in the east central part of section 29, T6S, R20E, near Klondyke, Arizona, is a silver-lead-copper deposit in a major fault zone. The literature reports the presence of fluorite, however, field examination on Nov. 8, 1975, found the fluorite to be extremely minor, less than 5%. Therefore, the deposit is of no interest as a fluorite reserve.

Location:

The mine is situated in the center of $E\frac{1}{2}/E\frac{1}{2}/E\frac{1}{2}$ of section 29, T6S, R20E, in Laurel Canyon about 4 miles north of Klondyke, Graham County, Arizona. The property is shown on the Klondyke 15' USGS topographic quadrangle.

Occurrence:

Mineralization occurs in a nearly vertical fault zone of about 50 foot width and has been mined from several levels. Apparently the property's history goes back many years. Much of the production was handled by a mill at the mine and more recently milling was done on the Aravaipa Valley road about $2\frac{1}{2}$ miles below the mine.

Victor E. Kral
Nov. 13, 1975

1 file

GUNSIGHT MOUNTAIN MINE

Fluorite-quartz-calcite mineralization is associated with pegmatite and schist near a granitic intrusion. The sampling indicated mineralization of 30-40% CaF_2 in veins 0.5 ft. to 2.0 ft. wide. Past production from underground workings was responsible for an unknown tonnage of metallurgical grade fluorspar.

The property was examined on March 19, 1975 by Glen Walker and William Hirt.

LOCATION

The mine is in the NE/SW/NE of Sec. 7, T17S, R11E, in Pima County, Arizona. It takes its name from its location on Gunsight Mountain, which is an outlier on the northwest side of the Sierrita Mountain range. Tucson, Arizona lies about 25 miles to the northeast.

The mine can be reached by taking Sierrita Mountain Road south from Arizona Highway 86 for about 8 miles, and then turning left for about half a mile. Then go south on a dirt road for half a mile to the mine.

PHYSICAL FEATURES

Hilly terrain with sparse desert vegetation surrounds the mine. Annual precipitation is 10.68 inches. A well was drilled at the mine but is now shut down, and the amount of water that could be made available from it is reportedly small. Adequate water is likely available in the Altar Valley to the west. Electrical power is transmitted along Highway 86, nine miles north.

HISTORY

The deposit has produced a small amount of metspar. It is presently inactive.

OWNERSHIP

Arizona State Land Department.

GEOLOGY

The country rock for the fluorite mineralization is a quartz-biotite schist, which has been intruded by granite. The granite intrusion forms a prominent hillock. In the schist are numerous subparallel pegmatite dikes striking north to northwest roughly parallel to the schistosity foliations. The dikes are 1-4 feet wide and up to half a mile long. They appear to have been deformed (pushed to the east) along with the schist when the granite intruded. Orthoclase and quartz form the bulk of the pegmatite dikes; minor biotite is also present.

Both the foliations in the schist and the pegmatite dikes dip steeply to the west or southwest at 60-65 degrees.

Fluorite mineralization is associated with one or a few of the dikes near the schist-granite contact. Planes of weakness in the schist probably influenced the location of emplacement of both the dikes and the fluorite, but the pegmatite and fluorite may have invaded the schist at different times.

All of the workings have been made along what is probably a single vein of fluorite which had been bulged out to the east by the granite intrusion (see map). The fluorite appears to have been associated with a single pegmatite dike, but the dike's continuity is uncertain.

The best exposure of the vein is in the underground drift south of the granite. Here the vein is about 2 feet wide and is composed of 0.5-1.0 feet of fluorite with a gangue of quartz, CaCO_3 , and schist.

DEVELOPMENT

Several large trenches or open cuts up to 150 feet long and 10-15 feet wide have been cut along the vein outcrop.

Development

A shaft of unknown depth was sunk at the south end of the workings, and an unknown amount of underground workings is visible at the north end of one of the open cuts. These underground excavations were not examined because of safety reasons. In addition a crosscut and drift totalling about 100 feet long were driven north of the granite intrusion to sample the vein; these workings were mapped.

The remains of a mill (jigging plant) and a concrete storage pad are still visible.

SAMPLING

Three chip samples were cut along the vein or surface and underground exposures. Sample locations are shown on the map by numbers and the analysis is given below.

SAMPLE NO.	SAMPLE DESCRIPTION	%CaF ₂	%SiO ₂
1	5" sample in south face of open cut	38.07	10.04
2	26" vein	41.34	31.00
3	3" + 2" of vein + 6" horse	34.54	33.14

The results indicate that milling would be necessary to produce a marketable product.

William Hirt
June, 1975

CUNSIGHT MOUNTAIN MINE

The property consists of 5-20 acre claims leased until March 7, 1992 from the Arizona State Land Department by Minerals & Milling Company, 5117 North Scottsdale Road, Scottsdale, Arizona.

It is located in section 5, 6 & 7, T17s, R11e, in Pima County, Arizona. The area is shown on USGS 15 minute topographic map, Palo Alto Ranch where the elevation is 4050 feet and the location is $111^{\circ} 15' 01''$ Longitude, $31^{\circ} 53' 53''$ Latitude.

The mine is reached from Tucson, Arizona by traveling 13 miles on it 3 miles to a cross road, turn left 1/2 mile (east) to a gate, through the gate 1 mile on a good trail.

According to the State Land Department \$15.96 royalty was received from this lease in 1974 which means approximately \$532.00 worth of jigged spar was sold to a Phoenix foundry. The mine is presently idle.

Arizona
Fluorite

Happy Day

Summary:

Not visited but fully described in RI 5651. Apparently somewhat similar to the White Christmas about 0.3 miles west which was examined by William C. Hirt and Victor E. Kral on May 8, 1975. As is common in this area, this is a minor barite deposit with a trace of fluorite.

Location:

In unsurveyed SW/SW Sec. 7, T7N, R16W, Yuma County, Arizona, about 4.0 miles NE of Bouse. The area is on the Utting 15' USGS topographic quadrangle.

Ownership:

Not known, and probably shows no evidence, (characteristic of this old work).

Occurrence:

Reported to be in black volcanic; probably basalt overlying limestone, as a short distance to the west.

Arizona
Fluorite

Happy Group

Summary:

The Happy Group Fluorspar occurrence is situated about one half mile west of Sandstone Spring shown on the Maverick Mountain 7 $\frac{1}{2}$ ' USGS topographic quadrangle. Sandstone Spring is 4.7 miles by jeep trail northeasterly of a ford on the Verde River at the Box Bar Ranch north of the Fort McDowell Indian Reservation. The property can be reached only by four wheel drive vehicle which must ford the Verde River. Examination of the deposit was made by Victor E. Kral on November 5, 1975 and again on January 8, 1976. The first trip was made on foot and time was inadequate.

Two dozer cuts, apparently dug in about 1972 expose a fluor spar vein of less than 200-foot length. One exposure is 7 feet in thickness; the other is only 4 to 8 inches.

Location and Ownership:

The Happy Group is located by Captain Elmer Young of the Mesa, Arizona, Police Force. It is about 3000 feet S75°W from Sandstone Spring which is on the Maverick Mountain 7 $\frac{1}{2}$ ' USGS topographic quadrangle.

To reach the property from the ford on the Verde River at the Box Bar Ranch drive 0.9 mile northerly, then turn easterly through a fence and up a wash, travel 1.7 miles up the wash and turn right into a tributary wash, then travel 2.1 miles to Sandstone Spring. From the Spring walk back up the road (southerly) one quarter mile then N80°W through a saddle in a rocky ridge 2000 feet to a point on a smooth granite ridge about 100 feet south and above the fluorite trenches.

Should a haulage road be required, a connection could probably be made between Sandstone Spring and Rock Spring about one half mile southeast. This would make connection with a Jeep trail to Ryan Tank from where a Jeep trail continues easterly to State Route 87 south of Sunflower. Other routes are also available, however, all require some road construction which must be permitted by the Forest Service.

Occurrence:

The fluorite vein is associated with a minor mafic dike intruding the Precambrian pegmatitic granite. Exploration here was done by the Tonto Mining and Milling Company of Punkin

of this cut, apparently on the same trend, is a 20-foot cut adjacent to a small 15-foot depth slope on the ridge. A 1.0-foot sample of the vein here contains 81.9% CaF_2 . About 800 feet southeasterly along the ridge and down somewhat on the southwest side two small cuts expose a 2.6-foot vein of fluorite which contains 66.4% CaF_2 .

Conclusions:

Notwithstanding the production, the poor access and size of this occurrence makes it difficult to imagine profitable mining from here.

Victor E. Kral
September 1975

Cat. trail 1500' to sand wash

N

1" = 50'

Fluorite assoc.
w/ mafic dike
(in cat. cuts)

90°

7' CaF_2 (sampled)

entire area
Precambrian

pegmatitic granite

90°

40°

4"-8" CaF_2

smooth
granite ridge

epidote float

Post

~300'

to post

HAPPY GROUP

~ NW/NE/NE SEC 22, T5N, R7E

MARICOPA COUNTY, AZ

VEK

January 1976

Arizona
Fluorite

Jerky

Summary:

The Jerky group of four claims owned by Woody Nichols of Globe is in the south half of section 36, T7N, R14E, Gila County, Arizona and is on the McFadden USGS topographic quadrangle. The fluorite exposures are reached by about 2 miles of Jeep trail west of graveled State Route 288. A map prepared by US Steel Corporation included with this report shows an exposed vein length of 4500 feet sampled in 37 trenches and five diamond drill holes. Drilling results were not available but are said to indicate the fluorite to a depth of 200 to 300 feet. This would infer about 300,000 tons of 65% CaF_2 grade. Mineralization is said to continue at both ends of USS mapping, however, the extremities of the deposit were not examined. Charles Nichols of Globe has claims on the west extension of the vein and plans dozer trenching here in the near future. The fluorite vein strikes E-W and dips approximately vertically in Dripping Springs quartzite. The property was examined on November 15, 1975.

Location:

The E-W vein cuts approximately thru the middle of the south half of Section 36, T7N, R14E, Gila County, Arizona and is reached by a two-mile Jeep trail off graveled State Route 288. The turn-off is on National Forest land 0.3 miles northeast of the boundary sign and 0.05 mile southwest of mile post 288 and the McFadden horse trail to the southeast. The property is at an elevation of about 6000 feet.

Occurrence:

US Steel's map shows sampling along 4500 feet of the E-W vein. The host rock is flat lying Precambrian Dripping Springs quartzite which varies from a reddish buff colored "dirty" quartzite to a slightly greenish gray hornfels. The fluorspar occurs in a long continuous vein in a fault zone. Complimentary faulting results in many small cliffs at the edge of a small canyon near the vein. Fluorspar thickness varies from one foot to over 10 feet and averages about 4.7 feet.

Although the results of five diamond drill holes were not available it is reported that the fluorite was found to extend 200 to 300 feet below the surface. Sampling was done in 37 trenches

along the 4500-foot length of the vein. The weighted average of these samples indicates a grade of 65.6% CaF_2 . If two narrow, and somewhat poorer, sections of the vein are eliminated the weighted average increases to 67.0% CaF_2 .

Reserves:

One reserve calculation is based on the elimination of about 600 feet of covered vein near the east end. Another calculation further removes 500 feet of narrow thickness at the west end of the deposit as well as 600 feet of narrow vein just west of the center of the deposit. Assuming the depth to be 200 feet, the first premise based on a length of 3900 feet, infers about 300,000 tons of 65.6% CaF_2 grade. The removal of the mentioned narrow widths results in a length of 2800 feet and infers 257,000 tons of 67.0% CaF_2 grade.

A third calculation of inferred ore would be to include the full 4500-foot length which would calculate 355,000 tons of 65.6% CaF_2 grade.

Conclusions:

With the Tonto Mill of about 130 tons per day capacity near Punkin Center, about 60 miles distant by road, available for fluorite concentration, this property becomes one of the more important reserves in Arizona. As the projection of fluorite reserves to 200-foot depth over 2800 to 4500 feet based on five holes is problematical, the property requires additional diamond drilling. More trenching of the vein, particularly in areas of cover, should also be considered. Data now available infer 200,000 to 350,000 tons of good mill grade spar. Sample analyses all show a high silica content, therefore, it appears unlikely that this ore can be mined clean enough for metallurgical spar.

Victor E. Kral
November 20, 1975

Jumbo Mine

Summary:

The Jumbo mine is situated in the N $\frac{1}{2}$ of the SE/NE of section 1, T6N, R5W and is 5 airline miles south of Wickenburg. It is 8.3 miles northwesterly of Morristown, Maricopa County, Arizona, on U.S. 60. The area is on the Wickenburg 7 $\frac{1}{2}$ ' USGS topographic quadrangle.

Early production of fluorspar was made from here by L. Foster in 1929. The present owner reports a total production of about 1500 tons.

The vein strikes about E-W and dips 45° to 60° south; it is traced on the surface for about 300 feet west of the main shaft. The host rock appears to be a very fine-grained dacite intruded by diorite porphyry.

Although this vein indicates little potential for additional ore, the general area has fluorite occurrences that warrant exploration.

Introduction:

The Jumbo mine is in the center of the N $\frac{1}{2}$ of the SE/NE of section 1, T6N, R5W, and is about 5 airline miles south of Wickenburg. To reach the property from Morristown, Maricopa County, Arizona, on U.S. 60 and the Santa Fe RR, drive 6.9 miles northwesterly, then turn left up a wash 0.8 mile to the West End - Good Luck mine, then turn right (northerly) 0.6 mile to a wash and road fork. At this point it is best to walk about 0.7 mile northwest up a jeep trail to the property. The Jumbo is owned by J. D. Campbell of Wickenburg who is also the last operator. He states that total production from here is about 1500 tons. Early production was made by L. Foster who reportedly operated this property and the West End - Good Luck in 1929.

Occurrence:

The E-W vein, dipping 45°-60° south, is traceable along old workings about 300 feet west of the present shaft. The host rock appears to be a very fine-grained dacite with some 3 mm feldspar phenocrysts which was intruded by a diorite porphyry. It appears that the workings were shallow, about 50 feet or less. Maps by the U.S. Bureau of Mines as part of an access road application report in August 1943, show only about 30 feet of depth in the vicinity of the present shaft.

It appears that early mining was done from an old shaft near the west end of the deposit. Only subtle evidence of the shaft now remains and it appears that stoping here was extensive.

Conclusions:

The vein appears to be essentially worked out and no evidence of an extension into unexplored area was noted. The regional area has other fluorspar occurrences with little or no exploration that warrant further attention.

Victor E. Kral
December 10, 1975

Limestone Hill

Summary:

Minor fluorite pods occur with gypsum in a shear zone in limestone. The possibility of commercial exploitation is extremely remote. Examination of the property was conducted on April 30, 1975 by William Hirt and Victor Kral.

Location:

The prospect is located in the SW/SW section 4, T4N, R10W in Maricopa County, Arizona. It can be reached by driving south from Aguila on the Eagle Eye Road for 19.2 miles and then walking about 0.2 miles east to a prominent hill containing the mineralization. The area is on the Lone Mountain 15° USGS topographic quadrangle.

Ownership:

The prospect is claimed by John and Clyde Lemon.

Mineralization:

At the bottom of the hill is a small hole (about 5'x5'x2' deep) exposing flat-lying limestone beds with intermittent veinlets of calcite and fluorite in a 4 foot shear zone. Very little fluorite can be seen in place (probably less than 10% CaF₂ in the exposure). A pile of fluorite near the hole indicates that a little pocket of fluorite was removed. The mineralization could not be traced on the surface. This hole is situated about 820 feet N60E from the section corner common to sections 4, 5, 8, and 9.

A cut on the side of the hill 300 feet N60E from the small hole exposes two more outcrops of fluorite. The fluorite occurs in two veins 8" and 2 feet wide in a shear zone with abundant gypsum interbedded with limestone. The limestone dips easterly at 20-30 degrees (varies from northeast to southeast), and is intruded by amphibolite in places. The shear zone strikes north-south and is probably an interbedding phenomenon. Gypsum is traceable on the surface for 100 feet along the cut, but the fluorite is pod-like and discontinuous.

No samples were taken as there is no potential here.

Victor E. Kral
July 1975

Little Fanny

Summary:

As stated by Elevatorski, fluorite occurs as stringers. This is also stated in USGS publications. The exposures were not visited but information available confirms that the occurrences have no reserve potential.

Location:

The occurrences are in the approximate center of section 9, T 16S, R 22 E, in Cochise County, Arizona. They are about 1 mile northwest of I-10 opposite the Dragoon turn-off. The area is on the Dragoon 15° USGS topographic quadrangle.

Occurrence:

In Professional Paper 416, Cooper and Silver state that such minor fluorite associated with tungsten veins in the Texas Canyon quartz monzonite is quite common.

Victor E. Kral
July, 1975

Little Lulu

Summary:

The Little Lulu appears to be an abandoned location in the NE $\frac{1}{4}$, section 23, T20S, R27E, and 9.5 miles by road east of Elfrida, Cochise County, Arizona. A southeasterly striking, 2-foot interbed fault zone that dips at 45° NE in limestone contains appreciable fluorite and has been exposed by a 60 foot trench to approximately 4 to 8 feet depth. A pile of 30 to 40 tons contains 41.5% CaF₂ as per USBM sampling. If fluorite economics improve, this occurrence may warrant further exploration. A road could be built to the property with little difficulty.

Location:

This occurrence is in the center of the NE $\frac{1}{4}$, section 23, T20S, R27E, and is reached from Elfrida, Cochise County, Arizona, by traveling 3 miles east on the Valley Union High School paved road, then south 1.0 mile on a graveled farm road, then east 2 miles on a private dirt road through the Clark ranch, then 0.5 miles south on a dike, then 1.0 mile east along a fence to a $\frac{1}{4}$ corner common to sections 27 and 28, then continue northeasterly on the same trail 2.0 miles to a spring. The fluorite is about one quarter mile north of the spring. This area is on the Swisshelm Mtn. 15' USGS topographic quadrangle.

Occurrence:

The fluorite occurs in an interbed fault zone of about 2-foot thickness in limestone striking southeasterly and dipping 45° NE. The mineralization can be traced about 100 feet south, probably in a parallel vein. The occurrence is near a granite contact and garnet skarn is abundant in a bed about 15 to 20 feet below the fault zone. The granite contact is about 50 feet downhill from the limestone and it is assumed that the depth of the limestone is only about 30 to 50 feet below the surface here.

A USBM Summary Report states that an examination in July 1957 found a 40 ton pile of fluorite that sampled 41.5% CaF₂, 14.3% CaCO₃, and 28.5% SiO₂. The pile is still there (1975) and appears to have the tenor reported. As this fluorite came from a 60 foot trench on the fault and it appears to have removed the vein to a depth of 4 to 8 feet, one would assume that the vein averaged about 30% CaF₂.

Victor E. Kral
November 1975

file

LONE STAR MINE

SUMMARY

Fluorite occurs in a vein in a faulted quartz-sericite schist. Past production from the mine was over 20,000 tons. The property may have further potential for fluorite production but could not be sampled because of unsafe conditions underground.

The property was examined on March 10, 1975 by Glen Walker and William Hirt.

LOCATION

The mine is in the NW/NE/NE of section 35, T18s, R19e, in Cochise County, Arizona. It is in the eastern foothills of the Whetstone Mountains in the Coronado National Forest. The nearest town is Benson, Arizona, 15 miles to the northwest.

PHYSICAL FEATURES

Hilly desert terrain with sparse desert vegetation surrounds the mine. Annual precipitation is about 15 inches. Only a small water supply is available at the mine site. Electrical power is available at State Highway 90 about 2 miles to the east.

HISTORY

The deposit was discovered in 1946. Mining from 1946-1967 has produced at least 20,000 tons of fluorspar (Keith, 1973), which would make the mine the largest fluorspar producer in Arizona. The mine is presently inactive.

OWNERSHIP

The ownership could not be definitely determined due to a lawsuit in progress.

GEOLOGY

This is a vein deposit which strikes northwest occurring in a fault in a contorted quartz-sericite schist. The vein could not be traced on the surface to the northwest of the open cut. To the southeast can be seen some veins, but they consist of quartz with no fluorite. Little alteration was seen in the open cut. Quartz appears to be the main impurity.

geology cont'd

According to an earlier an earlier report (Elevatorski, 1971) the ore shoots average 2-1/2 wide by 35 feet long by 35 feet high. Fluorspar seen on the dumps is colorless, white, or light green crystalline.

A sample of ore sampled at the mine by Elevatorski ran 37% CaF_2 , 2.7% silica, and 0.13% Pb.

DEVELOPMENT

Access to the ore was gained by means of an inclined shaft 400 feet deep and open cut leading into some underground workings. Two smaller shafts were sunk between the main shaft and the open cut. An exploration shaft 25 feet deep was sunk southeast of the main shaft but no development work was done on it. An indeterminate length of underground workings also exists, but was not measured or mapped because of safety reasons.

At the time of the examination the mine was closed to entry because a man was killed in the mine in 1973 or 1974.

REFERENCES

Keith, S. B., 1973, Index of Mining Properties in Cochise County, Ariz., Arizona Bureau of Mines Bulletin 137, Page 91.

Elevatorski, E. A., 1971, Arizona Fluorspar, Arizona Department Mineral Resources, Phoenix, Arizona page 10-12.

William Hirt
June, 1975

LONE STAR MINE

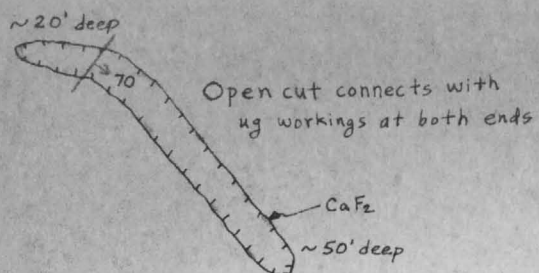
This property is presently in the throes of civil and criminal lawsuits, therefore, there has been no annual work performed for sometime. For this reason it is thought to have reverted to the Bureau of Land Management.

It is located in section 35, T13s, R19e, in Cochise County, Arizona. On USGS 15 minute topographic map, Benson, Arizona the shaft is shown to be at an elevation of 4920 feet and a location of 110° 21'52" Longitude, 31°49'53" Latitude.

The mine is reached from Benson by traveling 4 miles west on I-10 thence south 3-1/2 miles on Arizona highway 90 to a gate in the highway fence, through the gate to the right (west) for 1-1/2 miles to the shaft.

Since a fatality in the shaft the State Mine Inspector has closed the mine to any entry.

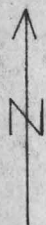
According to rumors this mine has produced more fluorspar than any other individual mine in Arizona but the amount is unknown.



Covered shaft
~30' deep

2 Compartment
Ore Bin

Opening to
ug workings
~25' deep



Main shaft

LONE STAR MINE
COCHISE COUNTY, ARIZ.
NE 1/4 SEC. 35, T18S, R19E
3-28-75
WCH

0 25 50 75 100
Scale (feet)

25' deep

file

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

Luckie No. 1 Mine

C
O
LOCATION: The Luckie No. 1 Mine is located in the Steeple Rock mining district in the western foothills of the Mule Creek Mountains, about 14 miles northeast of Duncan. The mine shaft is shown on the York Valley, Ariz.-N. Mex. 15 minute quadrangle in T. 7 S., R. 32 E., Sec. 3, SE $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$, SE $\frac{1}{4}$. The shaft symbol touches the 4720 contour line and extends halfway to the 4660, so the elevation is estimated as 4700 feet (1432 meters). The shaft is located at 32.84749° (32° 50' 50.96") North latitude and 109.05357° (109° 3' 12.85") West longitude on the topographic map.

P
Y
The Luckie No. 1 can be reached from Duncan by driving northwest on Arizona Highway 75 for 2 miles from the Ariz 75 - U. S. 70 junction. Turn right through a gate in the highway fence and drive 8½ miles northeast on a well-maintained gravel road to Goat Camp Spring. Turn left (northwest) on the jeep road for 1½ miles and the Luckie No. 2 shaft will be immediately to the north of the road. The Luckie No. 1 shaft is ½ mile northeast of Luckie No. 2 but the trail to it is presently washed out in one place.

OWNERSHIP: The Luckie No. 1 unpatented claim is recorded in Book 4, page 60, and amended in Book 5, page 354, of the Greenlee County Records office, Clifton, Arizona. The property is claimed by Judge Forrest Sanders, District Court Chambers, Courthouse, Las Cruces, N. Mexico.

GEOLOGY: The mine is located in an area of andesite porphyry that has several rhyolite dikes running through it. The ore vein lies at or near the contact between the andesite and one of these rhyolite dikes. The vein in the ore zone was approximately 7-8 feet wide, judging from the appearance of outcrops in the open out-glory hole, but it narrows down to one foot or less to the south. The vein consists of a breccia of silicified volcanic rock, probably andesite, which has been cemented

by quartz and white or colorless fluor spar, with abundant iron oxides and manganese oxides in place. Running throughout both the andesite and the rhyolite are numerous smaller veins consisting mostly of silica. The area of the ore deposit is moderately altered (silicified), making the rock at times difficult to identify.

The fluor spar deposits are the result of fissure filling, perhaps accompanied by some replacement of andesite porphyry along fault zones. Banded milky quartz is the predominant vein mineral, in places constituting almost the entire vein. Veinlets of drusy quartz are believed to be secondary. Even where the vein has been mined for its fluorite content, 35 to 40 percent of SiO_2 is commonly present. No calcite was found, although vein samples contained an average of 5 percent of CaCO_3 . Limonite in places coats fluorite and quartz. Psilomelane containing tungsten is also common in parts of the veins.

Both medium and coarse fluorite occur in veins, either brecciated or as a series of closely spaced veinlets interspersed through the brecciated andesite porphyry and gouge. Most of the fluorite is deep green, although some is blue green; fluorite cropping out at the surface is colorless. Fissure veinlets of fluorite as much as one inch thick are scattered irregularly through the quartz-rich part of the vein. The fluorite in these veinlets commonly occurs as well-developed cubes. The thickness of the veins containing fluorite ranges from less than an inch to 5 feet and averages between 3 and 4 feet.

The sequence of the vein minerals probably was milky quartz closely followed by fluorite or in part simultaneous with it. The veinlets of well-developed fluorite cubes cutting the milky quartz indicate that at least some of the fluorite was later than most of the quartz. The psilomelane and iron oxides are supergene minerals.

Much of the fluor spar in the mine is obviously later than the faults, since both the fluor spar and quartz surround and cement breccia fragments of andesite porphyry. Slickensides are common but give no evidence of the general direction of movement or amount of displacement along the faults.

The vein system in claim No. 1 is well exposed as low quartz ridges containing pockets of fluorspar. Because fluorspar is less resistant to erosion than quartz, the quartz content of the veins may be over-estimated in the outcrop.

On the surface fluorspar widths in all exposed veins range from less than an inch to 2.3 feet, although they may be greater in the debris-covered bottom of the long trench just west of the Sanders Shaft. Widths of fluospar underground are as much as 4.5 feet. The entire fault zone is not mineralized, for barren sheeted zones in the andesite porphyry commonly are parallell to margins of the Veins.

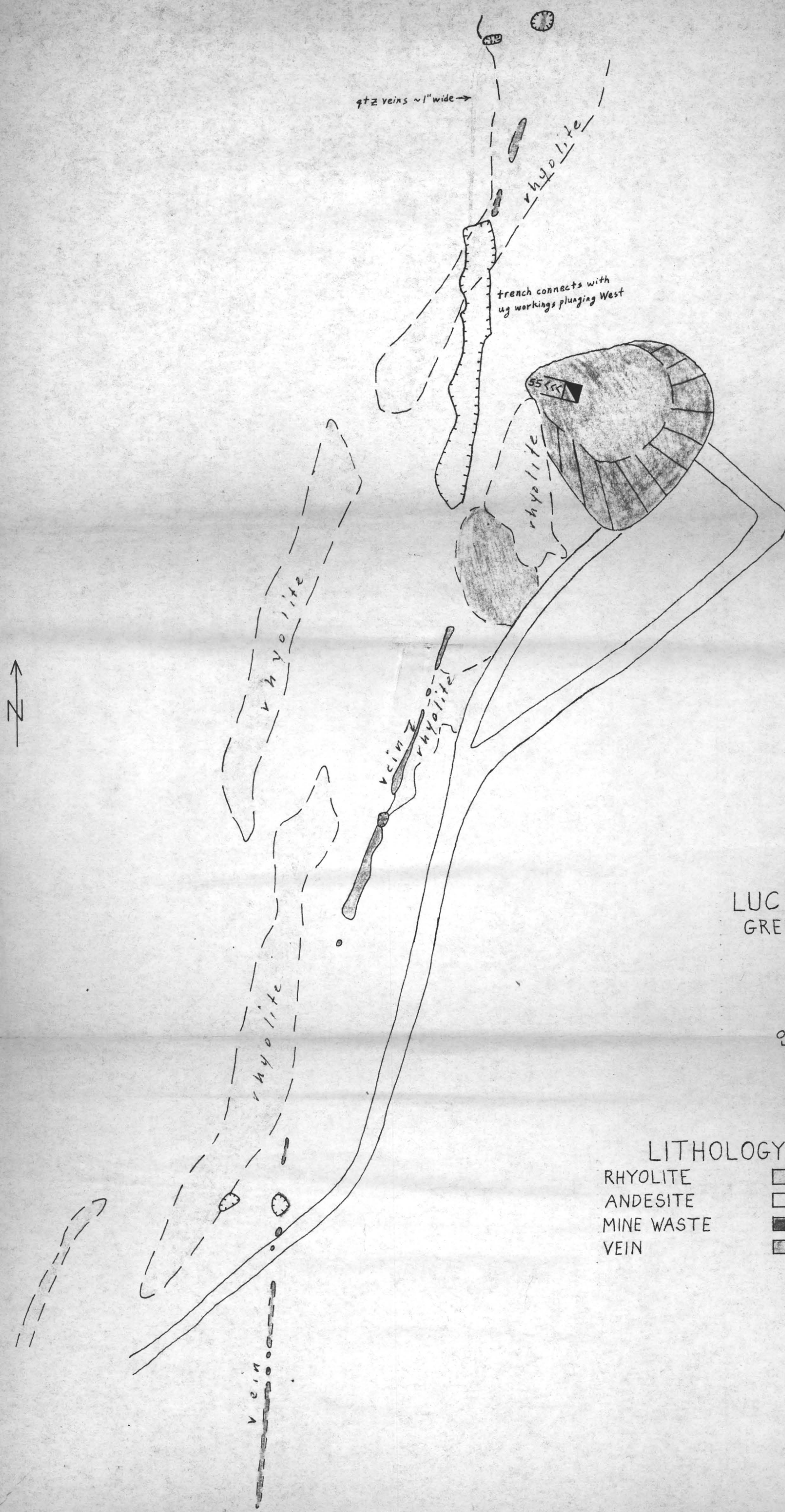
The easternmost vein is the best and perhaps the only commercial deposit of fluo-spar in Luckie No. 1, but a branch vein about 125 feet northwest of the Sanders shaft may also be of economic value. At the surface, the easternmost vein dips about 50° ; about 20 feet down the raise from the surface the dip flattens to about 35° or 40° and then gradually steepens again, until on the 71 foot level it is about 60° . The widest section of fluorspar is found where the dip of the vein is about 35° or 40° . Neither the north nor south face of the drift on the 71-foot level contains as much fluorspar as the part of the vein near the three stopes. From surface indications, however, it is reasonable to believe that the fluorspar might widen to between 2 and 3 feet farther north along the strike of the vein.

DEVELOPMENT: The mine workings consist of an inclined shaft and headframe, an open cut leading into some underground openings on the vein, and several small pits and trenches dug along the vein. The mine is now inactive and the workings underground were not entered as MESA denied access for safety reasons.

Maps and cross-sections of the underground workings in 1947 are illustrated in the U.S.G.S report by Trace. They include approximately 120 feet tunnel extending from the inclined Sanders shaft on the east across the vein. Where the tunnel intersects the vein, a 220 foot long drift was made at an approximate depth of 80 feet. At approximately 100 feet north of the original tunnel from the Sanders shaft a raise was put in.

Luckie No. 1 Mine

Average grade of the ore is about 40 to 50% CaF_2 , with 35 to 40% silica, and 5% calcite. The Luckie No. 1 & 2 was one of the four largest producers of the district. The ore is said to average 65% CaF_2 , which was attained by crushing and screening at the mine.







LUCKIE NO. 1 MINE
GREENLEE COUNTY, ARIZ.

4-1-75
WCH

0 25 50 75 100
SCALE (FEET)

LITHOLOGY

RHYOLITE	
ANDESITE	
MINE WASTE	
VEIN	

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

Luckie No. 2 Mine

LOCATION: The Luckie No. 2 Mine is located in the Steeple Rock mining district in the western foothills of the Mule Creek Mountains, about 14 miles northeast of Duncan. The mine shaft is shown on the York Valley, Ariz.-N. Mex. 15 minute quadrangel in T. 7 S., R. 32 E., Sec. 10, NW $\frac{1}{4}$, NE $\frac{1}{4}$, SE $\frac{1}{4}$, NW $\frac{1}{4}$. The shaft is on or slightly above the 4480 foot contour line (1366 meters) and is located at 32.84353° (32° 50 ' 36.71") North latitude and 109.05738° (109° 3' 26.57") West longitude.

The Luckie No. 2 Mine can be reached from Duncan by driving northwest on Arizona Highway 75 for 2 miles from the Ariz. 75 - U. S. 70 junction. Turn right through a gate in the highway fence and drive 8 $\frac{1}{2}$ miles northeast on a well-maintained gravel road to Goat Camp Spring. Turn left (northwest) on the jeep road for 1 $\frac{1}{2}$ miles and the Luckie No. 2 shaft will be within 75 feet north of the road.

OWNERSHIP: The Luckie No. 2 unpatented claim is recorded in Book 4, page 60, and amended in Book 5, P. 355, and the Luckie No. 3 in Book 4, page 60, and amended in Book 5, P. 356, in the Greenlee County Records office at Clifton, Arizona, under the ownership of Judge Forrest Sanders, District Court Chambers, Courthouse, Las Cruces, New Mexico.

GEOLOGY: The Luckie No. 2 Mine is located in an area of fresh andesite porphyry along whose fractures the fluorspar has been emplaced by hydrothermal solutions along with considerable silica. In this area very little alteration is present. The vein which forms the ore body strikes S. 56° E. and is surrounded by andesite porphyry along most of its extent. Rhyolite dikes adjoin the vein southeast and southwest of the vein as shown on Trace's geologic map. The andesite in the 'glory hole' has many quartz veins up to 1 inch wide running through it. The fluorspar outcrops at the surface in the glory hole and is colorless to light green in color.

The fluorspar deposits are the result of fissure filling, perhaps accompanied by some replacement of andesite porphyry along fault zones. Banded milky quartz is the predominant vein mineral, in places constituting almost the entire vein. Veinlets of drusy quartz are believed to be secondary. Even where the vein has been mined for its fluorite content, 35 to 40 percent of SiO_2 is commonly present. No calcite was found, although vein samples contained an average of 5 percent of CaCO_3 . Limonite in places coats fluorite and quartz. Psilomelane containing tungsten is also common in parts of the veins.

Both medium and coarse fluorite occur in veins, either brecciated or as a series of closely spaced veinlets interspersed through the brecciated andesite porphyry and gouge. Most of the fluorite is deep green, although some is blue green; fluorite cropping out at the surface is colorless. Fissure veinlets of fluorite as much as one inch thick are scattered irregularly through the quartz-rich part of the vein. The fluorite in these veinlets commonly occurs as well-developed cubes. The thickness of the veins containing fluorite ranges from less than an inch to 5 feet and averages between 3 and 4 feet.

The sequence of the vein minerals probably was milky quartz closely followed by fluorite or in part simultaneous with it. The veinlets of well-developed fluorite cubes cutting the milky quartz indicate that at least some of the fluorite was later than most of the quartz. The psilomelane and iron oxides are supergene minerals.

Much of the fluorspar in the mine is obviously later than the faults, since both the fluorspar and quartz surround and cement breccia fragments of andesite porphyry. slickensides are common but give no evidence of the general direction of movement or amount of displacement along the faults.

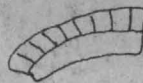
The vein system in the Lucke No. 2 claim is largely covered on the surface, in contrast to that in the No. 1 claim. The location of the vein is obtained only from the glory hole and shaft and by projection from underground workings.

The veins, composed of fluorite and quartz, dip generally about 70° North and have a more uniform dip than those in the Luckie No. 1 calim. The average fluorspar width that had been mined was probably between 3 and 5 feet, but no fluorspar width greater than 3 feet was exposed in 1947. Underground, several veins of varying widths, diverging from the vein system probably represent local irregularities in a complex fracture system. The vein shown in the underground workings, which strikes northwest from the shaft, however, may be related to another fracture system.

DEVELOPMENT: The mine workings consist of a 6 foot by 4 foot cribbed shaft 59 feet deep, a glory hole approximately 40 feet by 20 feet of unknown depth, and an indeterminate amount of underground workings. The underground workings were not examined in 1975 because they were deemed unsafe and access was denied by MESA.

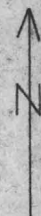
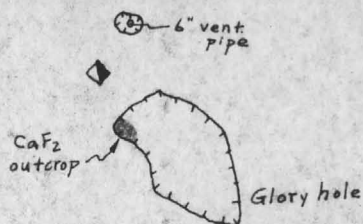
Maps and cross-sections of the underground workings in 1947 are illustrated in the U.S.G.S. report by Trace. They include approximately 100 feet of workings at the 64 foot level and 120 feet of workings at the 90 foot level.

The average grade of the ore was about 40 to 50% CaF_2 , with silica 35% to 40%, and 5% calcite. 65% ore was attained by crushing and screening at the mine.



Earth dam

86



Road

Rhyolite Dike

180

LUCKIE NO. 2 MINE
GREENLEE CO, ARIZ.
NW 1/4 sec. 10, T7S, R32E

0 25 50 75 100

Scale (ft.)

3-28-75

Rock Types

Andesite



Rhyolite



Arizona
Fluorite

Marcotte

Summary:

This group of claims was not visited; however, it is described in detail in RI 5651 (Barite). The several exposures on two veins show about 1 to 6 feet of barite; the composite of the various samples taken by the Bureau contained 71.1% barite and 6.4% fluorite. A grab sample of one from the deep shaft, taken by the Bureau for metallurgical testing, contained 69.6% barite and 11.7% fluorite. The property is not considered to have potential economic fluorite value.

Location:

The 12 claims described by the Bureau are largely in the west $\frac{1}{2}$ of sec. 13, T8S, R21E, Graham Co, with some overlap into sections 11 and 12. The Bureau gives the following road log:

- 0 Turn southwest on the Klondyke or Bonita road 6.4 miles west of Pima.
- 17.6 Turn left (south) on the Cedar Camp road.
- 19.5 Pass through gate and turn left.
- 25.8 Keep straight ahead.
- 26.0 Turn right (left fork goes to Graham prospect).
- 26.6 Arrive at claim No. 1 (deep shaft near here).

The claim group is on the Sierra Bonita Ranch 15' USGS topographic quadrangle.

Occurrence:

Two principal veins striking northwest with steep dips are about 1200 feet apart. Exposures on nearly all claims are described and vary from about 1 to 6 feet in thickness.

Victor E. Kral
July 1975

file

MT. JACKSON MINE
also called
RHODES SPAR MINE

SUMMARY

Mineralization consisting of quartz and fluorite occurs in a fault in gneissic granite country rock. There has been production of approximately 1200 tons from the property and sampling has disclosed mineralization of possible commercial interest.

However, more detailed work would be necessary to determine the amount of ore reserves.

The property was examined on March 1 and 2, 1975 by John Earl, Glen Walker, and William Hirt.

LOCATION

The Mt. Jackson mine is located in Graham County, Arizona in the southeast quarter of section 6, T6S, R22E, in the Santa Teresa Mountains. The nearest town is Ft. Thomas, about 15 miles to the northeast. The mine is now inactive.

PHYSICAL FEATURES

The immediate mine area is hilly desert terrain with a sparse covering of vegetation. Annual precipitation is about 15 inches. Adequate water and power supplies are available at 5-10 miles from the mine. The last 2-3 miles of road leading to the mine are in very poor condition.

HISTORY

In 1953 300 tons of ore were mined and sent to the Duncan flotation mill. Two truckloads of this ore assayed 67% CaF_2 , 3.4% CaCO_3 , 27.0% SiO_2 , and 2.4% Fe.

OWNERSHIP

The mine is owned by the Rhodes brothers, of Ft. Thomas, Arizona.

GEOLOGY

The fluorspar mineralization occurs in a fault, which strikes approximately S50E, and dips about 60° SW, in a gneissic granite country rock. Slickensides in place indicate that the fault movement was approximately horizontal, but the relative movement and its magnitude are unknown. The main vein was along a single fault, but running sub-parallel to it is at least one and possibly more subsidiary veins or stringers of fluorspar.

The granite is silicified in the area of the veins. The fluorspar is white to colorless to light green, and is associated with iron staining and quartz. Elvatorski (1971) reports that the vein in the large cut was 7 feet wide, but it is usually 1-3 feet wide.

Associated with the mineralization in the large open cut area is a diabase dike striking S36E and dipping steeply to the NE (?).

DEVELOPMENT

The most extensive surface excavation on the property is a 200 foot long trench-open cut which connects to some underground workings. These workings were not examined because they were deemed unsafe. In addition, three smaller trenches have been dug along the veins. Most of the production appears to have come from the large open cut and underground area.

SAMPLING

Pick and shovel were used to expose the vein on the surface in several places. These exposures and outcrops in existing workings were sampled by chip sampling, and assayed for fluorite and silica. The results of the sampling are shown below; the samples are located on the map by number.

Mt. Jackson Mine - Page 3

SAMPLE NO.	SAMPLE DESCRIPTION	%CaF	%SiO ₂
1	12" vein in face of cut	44.22	15.88
2	18" vein located 10' NW of cut	52.19	15.34
3	12" vein on hanging wall of cut plus 6" on footwall	49.66	23.60
4	3" vein located 30' NW of cut	28.35	36.56
5	1" vein	47.17	2.52

These samples show some milling grade mineralization.

Some form of beneficiation would be necessary to make a marketable product.

CONCLUSIONS

There is some potential for further fluorite production from this property.

Beneficiation would be necessary to produce a marketable product.

More work is needed to define the tonnage of reserves.

Arizona
Fluorite

New York

Summary:

This is a skarn deposit of copper. No fluorite was seen during a property examination by William Hirt on June 21, 1975.

Location:

The mine is in the NE/NE of Sec. 29, T17S, R16E in Pima County, (contrary to Elevatorski). The workings are shown on the Empire Mountains 15' USGS topographic quadrangle.

Mineralization and Development:

The New York Mine and neighboring deposits are skarn deposits at the contact of limestone and intrusive rocks. The development and mineralization are well described in USGS Bulletin #582, published in 1915 (reproduction attached). In spite of the date of the publication, it is still an accurate description of the property (with one exception) for little or no work has been done on the property since then. The inaccuracy of the USGS bulletin concerns the fluorite - the "coarsely crystalline calcite - quartz - fluorite boulders" contain no fluorite. The are mostly quartz with some calcite.

No fluorite was seen at any working or outcrop. Some quartz seen near Schrader's "new tunnel" is coarsely crystalline and green; perhaps this is the "fluorite".

References:

- Schrader, F. C., 1915, Mineral Deposits of the Santa Rita and Patagonia Mountains, Arizona, with contributions by J. M. Hill, USGS Bulletin 582, pp. 137-138.
- Lee, C.A., and Borland, G.C., 1935, The Geology and Ore Deposits of the Cuprite Mining District, Univ. of Arizona, MS Thesis.
- Browne, J. F., 1958, The Geology of the Cuprite Mine Area, Pima County, Arizona, University of Arizona, MS Thesis.
- Keith, S.B., 1974, Index of Mining Properties in Pima County, Arizona, Arizona Bureau of Mines, Bulletin, 189, p.127.

Re-examination:

This was re-examined on Nov. 19, 1975 and the absence of fluorite was conformed. A slightly bluish crystallized dolomite found in the limestone conglomerate also looks like fluorite but was found to contain no fluorine by the Arizona Bureau of Mines.

Victor E. Kral
Nov. 12, 1975

Osborn

Summary:

This is apparently an old gold prospect 8 miles south of Payson with considerable workings on a wide shear zone. No fluorite was noted and the property has no potential for economic production fluorite. The prospect was examined on May 29, 1975 by Victor E. Kral and William C. Hirt.

Location:

The property is at an elevation of 3350 feet just east of State Route 87, northbound, 0.7 miles north of Rye in Gila County, Arizona. It is approximately 8 miles south of Payson. Part of the workings can be seen from the highway and the others are a few hundred feet off the road to the east. The prospect is in the SE/SE of Sec. 17, T9N, R10E, and is on the Payson 15' topographic quadrangle.

Occurrence:

An E-W shear zone as much as 50 feet thick has been explored for gold by an adit, several shafts and several open cuts, all now caved except one windlass shaft sunk in the past few years. The host rock is an altered amphibolite intruded by a very fine grained rock of medium composition. Much iron was introduced as pyrite and some gossan was noted. No fluorite was found.

Victor E. Kral
July, 1975

Pay Day

Summary:

The mineralization consists of barite, manganese, and minor fluorite along with quartz in shear zones in granite and diorite. An examination by Victor E. Kral and William C. Hirt on May 7, 1975 showed no fluorite of potential commercial interest. The barite mineralization is described in RI 5651, pp. 68-69.

Location:

The prospect is located in the SE/NW of section 29, T7N, R17W, in Yuma County, Arizona. It can be reached from Bouse by traveling 1.25 miles west and south on the Quartzite road, then westerly 1.5 miles on a desert road, then left 0.45 miles to the deposit. This area is on the Bouse 15' USGS topographic quadrangle.

Ownership:

The Pay Day Nos. 1 and 2 were found; only the Pay Day No. 2 had papers, it is owned by J. B. Simpson, Box 308, Bouse, Arizona and J. M. Sprinkle.

Occurrence:

The dominant mineralization consists of barite and manganese which are found in shear zones in both granite and diorite. Granite is the principal country rock in the northwest part of the mineralized zone while diorite is the host to the southeast. Considerable quartz is associated with the barite and manganese veins in the granite. The shears trend northwesterly and dip steeply to the southwest; one exception dips northeast. The barite exposed in the cuts is up to 1.5 feet thick.

Fluorite was found in two of the numerous small cuts and trenches. One cut exposes about a dozen less than 1-inch thick cross-veinlets of fluorite. In another pit quartz and fluorite pods were noted in a shear zone with up to 12 inches of fluorite. In neither case could the mineralization be traced away from the excavation. The veins were, therefore, not sampled. No potentially commercial fluorite was found on the claims.

Peabody

Summary:

As elsewhere in the Johnson Camp area minor fluorite is common as a gangue mineral and as small seams in the limestone. The occurrences are of no interest as potential fluorite reserves. The property was not visited; however, adequate information was obtained from Ted Eyde, of Superior Oil and other sources.

Location:

Elevatorski apparently refers to the Moore Mine which is a mile north of Johnson Camp and about three miles north of ramps on I-10 about 1.5 miles northeast of the Texas Canyon Summit. The Moore Mine is in the N 1/2, SE 1/4, of sec. 23, T 15S, R 22E, Cochise County, Arizona.

Occurrence:

Minor occurrences of fluorite as individual seams in the limestone as well as the intrusive quartz monzonite is common over a widespread area but no deposits of economic potential have been noted.

From Professional Paper 416 by Cooper and Silver: "Colorless, pale-blue, pink or deep-purple fluorite is a characteristic mineral of the tungsten veins in and near the Texas Canyon quartz monzonite and the altered rock immediately adjacent to these veins..... At Johnson, fluorite is common in small quartz-orthoclase veins associated with copper and zinc sulfides." They go on to say that fluorite is also found in barren veins and aplite dikes. Further, it is lacking from most pyrometasomatic ore but some is found at the Peabody (Moore Mine).

Victor E. Kral
July, 1975

file

PHILLIPS OR GOAT CAMP MINE

LOCATION: The Phillips Mine, also known as the Goat Camp Mine is located in the Steeple Rock mining district in the western foothills of the Huila Creek Mountains, about 11 miles northeast of Duncan. The mine shaft is shown on the York Valley, Ariz.-N. Mex. 15 minute quadrangle 1/2 mile west of the state line in T7s, R32e, Sec. 15 wa, ne1/4, sek. The mine is on the 4400 foot contour line (elevation 1341 meters) and is located at 32.82863° (32° 49' 43.07") North Latitude and 109.06043° (109° 3' 37.54") West Longitude.

The Goat Camp Mine can be reached from Duncan by driving northwest on Arizona Highway 75 for 2 miles and from the Ariz. 75-U. S. 70 junction. Turn right through a gate in the highway fence and drive 3 1/2 miles northeast on a well-maintained gravel road to Goat Camp Spring. The mine shaft is located about 1/2 mile northwest of Goat Camp wash and can be reached by a trail running southwest from Goat Camp Spring along the north side of the wash then northwest for 1/2 mile to the mine shaft.

HISTORY: Probably the BLM as no recent record of location was found in the Greenlee County Courthouse.

GEOLOGY: The country rock is an andesite with rhyolite dikes and what appears to be a welded tuff. A latite dike carrying some pyrite was noted at the southern end of the workings. Its relation to the other rocks was obscured by piles of waste rock from the mine, which covered the outcrop.

The fluorspar occurs in a vein of quartz and fluorite (CaF_2) which strikes slightly northeast, passing through rhyolite, tuff, and andesite. The most favorable host rock for fluorspar appears to be rhyolite and tuff.

The vein continues to the north in andesite but here it consists mostly of quartz; the fluorite is very minor in the andesite section of the vein. No southern extension of the vein was found; the mineralization appears to have terminated at the south end of the y-shaped trench.

The vein trends parallel to the dominant joint set in the rhyolite and probably the joints served as an ore control. Alteration is slight to moderate, except for the rhyolite which is well silicified.

DEVELOPMENT: A shaft about 30 feet deep was sunk on the vein. Two large trenches yielded some fluorspar from the vein also. There are several small pits and trenches on the vein and the country rock. An undetermined amount of underground workings also exists, but was not examined for safety reasons. Excavations and geology are shown on the map.

Polly Ann Mine

LOCATION: The Polly Ann Mine, also known as the Forbis Mine, is located in the Steeple Rock mining district in the western foothills of the Mule Creek Mountains, about 15 miles northeast of Duncan. Three mine shafts are shown on the York Valley, Ariz.-N. Mex. 15 minute quadrangle; the northernmost shaft is located in T7S, R32E, Sec. 4, SW $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$ and the two other shafts are in the same township, Sec. 9, NW $\frac{1}{4}$, NE $\frac{1}{4}$, NE $\frac{1}{4}$. The shafts are on or slightly above the 4400 foot contour line (1341 meters) and are located at (32° 50' 44.88") North latitude and (109° 4' 23.16") West longitude on the topographic map.

The Polly Ann Mine can be reached from the U.S. 70 - Ariz. 75 junction in Duncan by driving approximately 2 miles northwest on Arizona Highway 75 to a gate in the highway fence, turn right (north) on a well-maintained gravel road leading up a sandy wash for over 8 $\frac{1}{2}$ miles to Goat Camp Spring, turn left (northwest) on the jeep road for 2 $\frac{1}{2}$ miles, past the Luckie No. 1 & 2 on the right (north) side of the road, to the Polly Ann Mine on the left (south) side of the road.

HISTORY: The earliest record indicates that the Polly Ann Mine was owned by Captain Bert L. Forbis of Duncan, Arizona, in 1937. Production then was listed as 150 tons/month of high and low grade fluorspar (the high grade was given as 89% CaF₂, metallurgical spar). In addition to the initial claim acquired by Captain Forbis in 1937, there are four other claims adjoining it.

In a 1952 report, the mine is listed under the ownership of Fluorspar Producers Corp. of Culver City, California. Arizona Eastern Fluorspar Corp. of Duncan took over from them in 1952.

OWNERSHIP: "The claims are presently owned by Ben Billingsley of Duncan, Arizona. The two Polly Ann claims are recorded by Mr. Billingsley on book 33, pages 123 and 129 in the Greenlee County Records Office at Clifton, Arizona. Contiguous to the Polly Ann Mr. Billingsley has two White claims and one White fraction, which are recorded in book 33, pages 130, 131 and 132.

The claims are presently leased by Producers Minerals Co., Ralph Morrow, manager, Safford, Arizona."

GEOLOGY: "Fluorspar occurs as fissure veins in a shear fault. According to the owner, the ore is mostly pale to deep green, coarse-grained crystalline and occurs as shoots that are 4 to 6 feet wide by 50 feet long and 50 feet high. Some of the ore on the dump is columnar, banded and of medium grained, crystalline texture."

"Host rock for the fluorspar is a rhyolite tuff that is intruded by a porphyritic andesite. Nearby is a bleached area of rhyolite rocks which is indicative of hydrothermal alteration." The rocks are shown as Tertiary age on the Greenlee County geologic map by the Arizona Bureau of Mines.

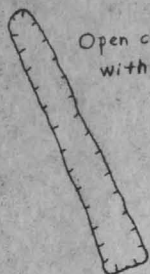
"The ore vein strikes northwest-southeast and dips 82° to the southwest." "On the surface, the fissure veins extend for a distance of 4000 to 5000 feet in an easterly direction to the Luckie Mine workings. The average grade of the ore shipped was 65% CaF_2 with 25 to 30% SiO_2 ;" "the high grade ran 90% CaF_2 with very little silica."

DEVELOPMENT: "The Polly Ann Mine consists of 3 shafts in a line trending $N 47^{\circ} W$. The shafts have been developed to depths of about 160 feet where water was encountered. The lower diggings were subsequently flooded and operations ceased. The mine was pumped out in 1969 for examination, but has been allowed to fill up again." "Access to the underground connecting drifts was denied by MESA for safety reasons."

"An open trench (open stope) between the first and second shafts connects with the underground workings. The trench is 119 feet long and between 30 and 43 feet deep and also trends 47° southeast.

Production was 6500 tons between 1938 and 1944 from this and adjoining properties."

▲ Inclined
shaft



Open cut connects
with ug workings



⊙ Pit 20' deep

POLLY ANN MINE
GREENLEE COUNTY, ARIZ.
NE 1/4 SEC. 9, T7S, R32E
3-28-75
WCH

0 25 50 75 100
Scale (feet)

Arizona
Fluorite

Princess Ann

Summary:

This is a barite occurrence with minor fluorite not evident megascopically. No commercial potential for fluorite recovery is foreseen. The property was examined by Victor Kral and William Hirt on April 30, 1975. The occurrence is described in RI 5651, pp.37-39.

Location:

The deposit is on the northwest tip of the Big Horn Mountains in the center of section 34, T5N, R10W in Maricopa County, Arizona. To reach the property, take the Eagle Eye Road for 17.85 miles south from Aguila. Then walk about 0.15 miles east across a wash to the property. The area is on the Lone Mountain 15' USGS topographic quadrangle.

Ownership:

The property is owned by the Southern Mines and Milling Co., 5117 N. Scottsdale Road, Phoenix, Arizona.

Geology:

The mineralization is in a fault breccia zone in a country rock of volcanic (andesitic - basaltic) agglomerate. Development consists of a single cut bearing S70E, which is 120 feet long and 15 feet wide and is situated on the fault. The northwest end of the cut ends in a dry wash.

The mineralization is dominantly barite and is well - exposed on the south side of the cut. No fluorite was seen. The vein and shear zone are traceable on the surface for about 150 feet to the southeast beyond the end of the cut. Beyond this point the vein is covered to the southeast by a basaltic agglomerate which does not show the fault or mineralization.

All rocks in the area are underlain by limestone. No samples were taken, however, RI 5651 states that a representative sample for metallurgical tests contained 53.0% BaSO₄ and 15.6% CaF₂.

Victor E. Kral
July 1975

Arizona
Fluorite

Quartz Ledge (White Cow)

Summary:

The Quartz Ledge Fluorite property apparently owned by the Tonto Mining and Milling Co. of Punkin Center is situated about 8.4 miles NNE of Punkin Center, Gila Couty, Arizona.

The property produced about 3000 tons of ore that was processed in the Tonto Mill during 1971-1973.

The ore occurs in two nearly parallel steeply dipping veins in granite. Due to a nearby creekbed, the water table is not far below the surface. Underground mining, started on one vein, and necessary on the other, will encounter water. The latter vein was mined by an open cut and was the source of the production.

No known reserves are available and it is doubtful that profitable reserves can be developed.

Introduction:

The Quartz Ledge fluorite property is about 8.4 miles NNE of Punkin Center, Gila County, Arizona, at an elevation of 3200 feet. It is found on the Picture Mtn. 7.5' USGS topographic quadrangle about one half mile west of Quartz Ledge Spring. The adjoining Kayler Butte 7½' quadrangle to the west shows much of the road. To reach the property from Punkin Center, take the Greenback Valley Road 2.2 miles easterly, then turn northerly for 1.3 miles, keep right at a fork for 2.3 miles, pass through a gate at 0.5 mile, turn left at a road fork in 0.1 mile, then continue 2.0 miles to the property. The prominent white quartz outcrop is visible for one half mile or more before reaching the mine. The examination of this property was made by William C. Hirt and Victor E. Kral on May 29, 1975.

The property is apparently owned, and was last operated, by the Tonto Mining and Milling Co. of Punkin Center. About 3000 tons of ore from here was milled some time during the period of 1971-1973.

Occurrence:

The principal vein strikes N45°W; it was mined from a large open cut about 1000 feet long, about 20 feet wide and 15 to 20 feet deep. As the cut contains much sloughed wall rock the vein is not exposed.

Another vein about 150 feet northeasterly of the open cut strikes N40°W and dips about 85° SW. Some mining has been done here from an inclined shaft dipping 15° NW. It appears that the incline is short, 100 feet or less; as the portal is near creek bottom, the incline is filled with water. The vein exposure, just above and 50 feet NW of the incline, is 3.2 feet thick and occurs in a fresh granite exposure about 45 feet wide within Precambrian granite. A sample of this vein contains 26% CaF_2 and 71% SiO_2 .

About 100 feet SE and across the creekbed from the incline is a caved incline on a 1 to 3-foot vein striking N65°W. This vein narrows to less than one foot 50 feet SE of the caved incline.

Conclusions:

This property has no known reserves and it appears unlikely that profitable reserves will be found.

The open cut mined a small tonnage at relatively low cost, however the method limited the available tonnage. Both veins require underground mining and water soon becomes a hindrance.

Victor E. Kral

December 20, 1975

Arizona
Fluorite

Rainbow

Summary:

This is a copper prospect 21 miles southwest of Aguila. A vein 450 feet long bearing SW and dipping 24° SE into the hillside has been exposed by dozer trenching and a 60-foot inclined shaft in what appears to be the best mineralization. The principal mineralization is barite, however, a 4-foot sample cut near the portal of the incline contains 29.6% CaF_2 . Minor amounts of oxidized copper minerals were noted. As a fluorite prospect this is of minor interest. The property was examined by William C. Hirt and Victor E. Kral on April 30, 1975.

Location:

The property is in Maricopa County and is shown on the Lone Mountain 15' topographic quadrangle as the Rainbow Mine in the center of Sec. 6, T4NR10W. It is reached from Aguila by traveling southwesterly 19.4 miles on the Eagle Eye road, then turn off westerly and northwesterly on a straight bladed road 1.7 miles to the north side of a low hill.

Ownership:

This is part of a large number of unpatented claims staked over several miles of the area by a Mr. Chisholm. This location was probably made for copper.

Occurrence:

A mineralized fault zone strikes about N40°E and dips 25°SE into the hillside; it is exposed by 450 feet of dozer trenching and a 60-foot inclined shaft in the better part of the vein. The mineralization is nonexistent, or very minor, except at the shaft and narrows as it goes deeper in the shaft. A 4-foot sample across the vein at the shaft contains 29.6% CaF_2 . The country rock here is a reddish hornfels.

Conclusion:

This prospect is of only minor interest for fluorite in spite of a fair sample at the only place showing any appreciable mineralization.

Victor E. Kral
July 1975

Red Chief

Summary:

Being 9 miles from Bouse, a source of milling water, and having about 11,000 tons of 33.5% CaF₂ and 27.0% BaSO₄ material as mill feed makes this property interesting but it must be combined with several more similar properties to support a mill. Such reserves are not now known to exist in the area. It is an important potential reserve but of little interest for the short term. The examination was made by Victor E. Kral and William C. Hirt on May 6 and 7, 1975. The U.S. Bureau of Mines work here is well described in RI 5651, Barite Deposits of Arizona.

Location:

The two claims are in an area of minor relief at an elevation of of 1360 feet largely in the NE/NE of Sec. 31 and the NW/NW of Sec. 32, T6N, R17W, in Yuma County, Arizona. The area is on the Bouse 15' USGS topographic quadrangle 9 miles southerly of Bouse off the Quartzite road. It is reached by taking the Quartzite road out of Bouse, travelling 8.3 miles, turning west and southwest 0.7 miles to the property.

Ownership:

The deposit is apparently covered by two claims, Barium #21 and Red Chief #5. The Yuma County records show assessment work for the year 1974-75 being done for J. J. Cavanaugh and heirs.

Occurrence:

This fluorite-barite mineralization is in a N50°E shear zone dipping 85° NW; the principal fault is on the hanging wall. The shear zone is mineralized for about 2000 feet and continues with little or no mineralization for another 1200 feet to the northwest. Frequently the zone consists of three veins which join, split, widen and narrow over the length of the exposure. Banded barite is prominent. The deposit is hidden by overburden to the southwest, however, this end of the mineralization is of lesser importance. The northeast end of the shear zone falls off rapidly in fluorite-barite but gradually increases in manganese content.

Sampling:

About 1900 feet of the mineralization was sampled by 16 samples, (see sketch map) taken in the lateral exposure and other exploration openings made by the U.S. Bureau of Mines in the 1950's. The results follow:

<u>Sample No.</u>	<u>Width</u>	<u>Mnz.Length Represented</u>	<u>BaSO4</u>	<u>CaF2</u>	<u>SiO2</u>
1	2.8'	-	54.7	16.5	13.1
2	2.5'	-	48.4	16.7	21.3
3	2.5'	-	48.6	14.8	22.3
4	2.0'	-	58.0	23.0	9.5
5	2.5'	-	36.3	30.2	13.5

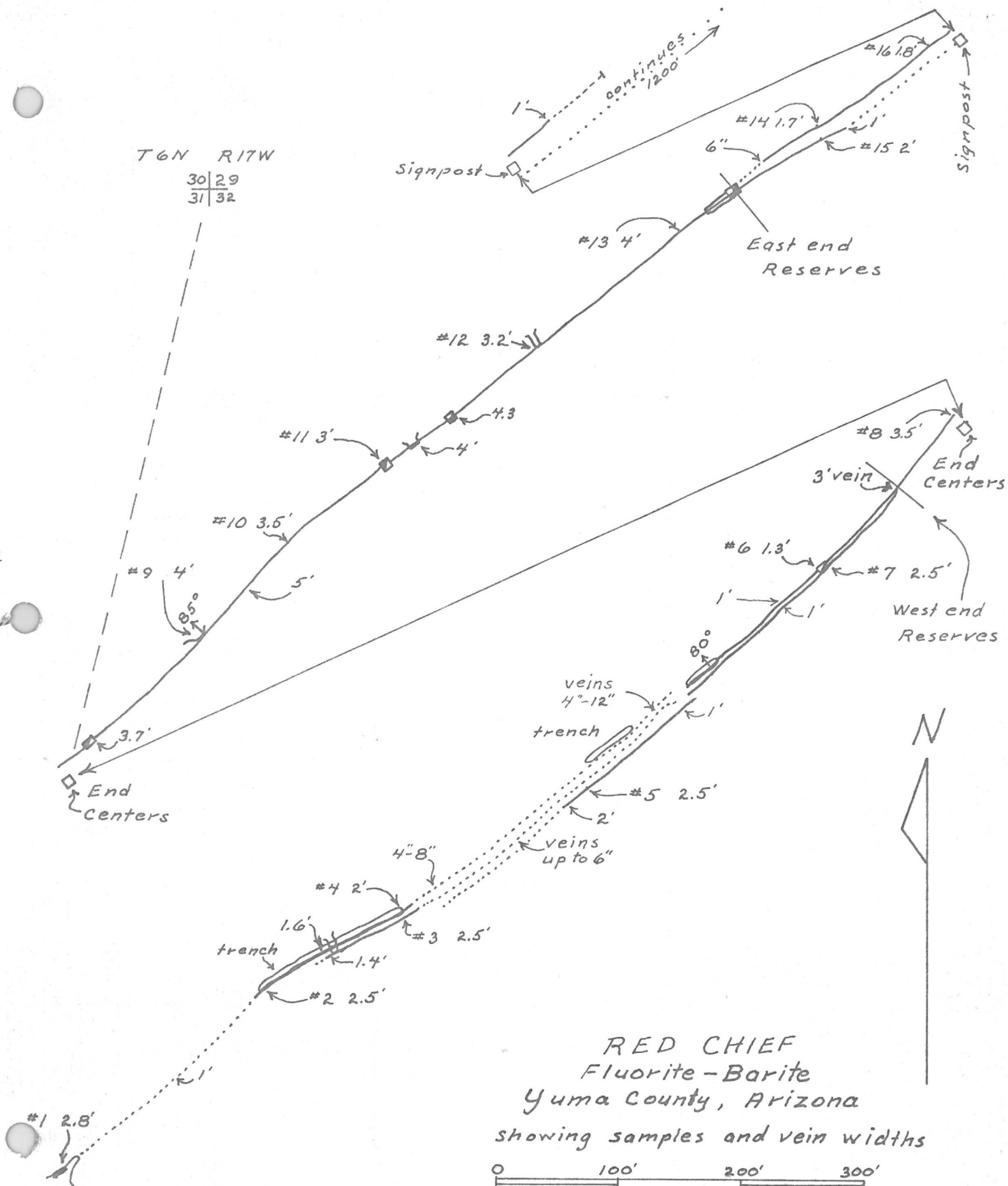
continued on next page

<u>Sample No.</u>	<u>Width</u>	<u>Mnz. Length Represented</u>	<u>BaSO4</u>	<u>CaF2</u>	<u>SiO2</u>
6	1.3'	---	18.7	37.6	28.4
7	2.5'	---	40.6	28.2	14.0
8	3.5'	150'	30.9	35.4	25.9
9	4.0'	135'	11.3	28.2	36.2
10	3.5'	105'	19.4	31.4	31.1
11	3.0'	125'	19.2	47.2	20.7
12	3.2'	150'	27.7	28.7	32.6
13	4.0'	135'	48.7	32.7	11.1
14	1.7'	---	53.1	32.1	9.1
15	2.0'	---	49.7	18.6	21.4
16	1.8'	---	66.1	18.2	13.4

Only the 800 feet represented by samples #8 through #13 is considered potential ore. Based on the analyses, the specific gravity calculates to be 3.11, and assuming 5% voids, this potential ore would have about 10.3 cu. ft. per short ton (10 was used). Assuming a depth of 50 feet, the reserve calculates to be 11, 120 tons of weighted average 33.5% CaF2 and 27.0% BaSO4 based on sample width and mineralization length represented.

Conclusions:

Given good milling facilities and somewhat better economics for fluorite and barite, this property is worthy of consideration. The obvious problem is reserves in the district. It would take several deposits like this to support even a small mill and this is the best deposit examined in the area. It appears, therefore, that the demand for fluorite and barite must increase to the point where other similar deposits are found before this deposit can be worked.



Arizona
Fluorite

Red Rock

Summary:

The Red Rock mine is 11.5 miles NEE of Punkin Center, Gila County, Arizona, at an elevation of 5400 feet, and is just off Forest Road No. 288.

It is owned by the Tonto Mining and Milling Company of Punkin Center who treated about 1000 tons of ore from here in the Punkin Center Mill.

The ore occurs in one vertical vein developed for 150 feet by two levels, the lower of which is approximately at creek bed level. The host rock is quartzite.

No reserves appear to be left but further exploration on the vein to the west is justified.

If the water problem can be handled, reserves could probably be found below the present lower level.

Introduction:

The Red Rock mine is situated 11.5 miles NEE at Punkin Center, Gila County, Arizona, on Forest Road No. 288, 5.0 miles NE of the Greenback Valley Road. The mine is shown on the Picture Mtn. 7½' USGS topographic quadrangle about one quarter mile south of Red Rock Spring. The property is reached from Punkin Center by taking the Greenback Valley Road 6.5 miles easterly, then turning left on Forest Road No. 288 about 5.0 miles and turning left 0.1 mile to the mine portal. The mine is at an elevation of 5400 feet in a narrow steep canyon cut in quartzite. The examination was made on May 29, 1975 by William C. Hirt and Victor E. Kral.

The mine is ~~#####~~ owned by the Tonto Mining and Milling Co. of Punkin Center, about 1000 tons of ore from here was processed at the Punkin Center mill during the period 1971-1973.

Occurrence:

The mine is opened by a short cross-cut adit connecting with a 150-foot drift on the N70°W vertical vein. Just above this level (15 feet floor to floor) is a 150-foot drift adit driven westerly from the portal on the cliff face. Chutes indicate that the ore has been stoped above the upper adit and one can only assume that all worthwhile ore was removed. The ore was dropped through draw points to the lower level.

The vein varies from one-foot to five feet in thickness and is on the northside of an E-W trending canyon in a quartzite cliff. The lower cross-cut adit is approximately at creekbed level and seems to slope slightly downward toward the drift; this causes some accumulation of water at the drift-cross-cut junction.

The westend of the vein in the lower level is two feet thick; the eastend (near cliff face) is 3.7 feet thick; a sample from the latter contains 76% CaF_2 and 19% SiO_2 .

Conclusions:

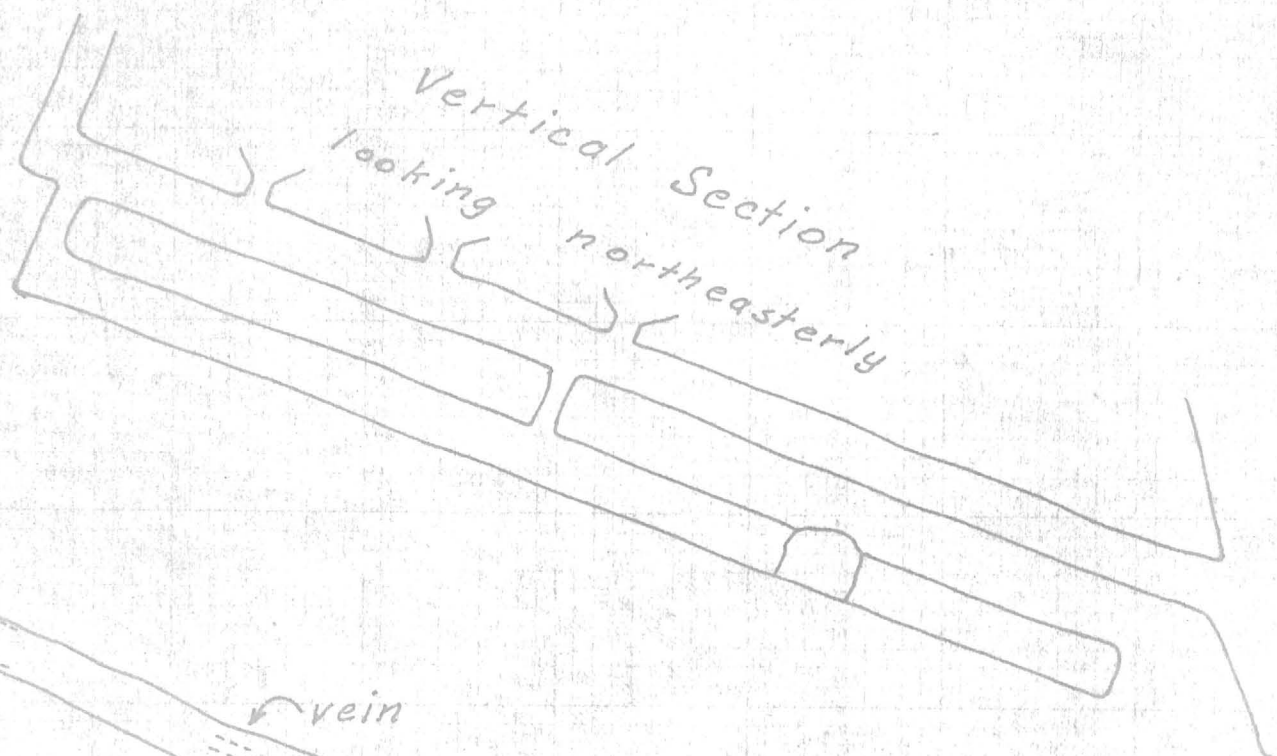
No reserves are available as it is assumed that all ore above the drifts was stoped, however, it appears that drifting should continue westerly to investigate that part of the vein not explored.

Undoubtedly the floor of the lower drift is in ore; if the water can be handled, reserves could probably be developed below the present workings.

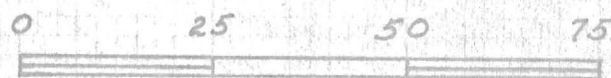
Victor E. Kral

December 20, 1975

This property is approximately in the NW/SE/NW of section 19, T7N, R12E, unsurveyed.



RED ROCK MINE
Gila County, Arizona



Dec. '75

Arizona
Fluorite

RHODES MINE

This property contains 6 unpatented claims recorded in the Grhaam County Records office as the Jackson Mountain #1 through #6 in docket 98, pages 64 & 65, and docket 184 pages 300, 301, 302 & 303, by Charles R. Rhodes, Ft. Thomas, Arizona.

It is located in sections 6, 7 & 8, T6S, R22E. The USGS 15 minute Jackson Mountain quadrangle sheet covers the claims and indicates the mine elevation to be 4150 feet, and the location $110^{\circ}07'30''$ Longitude, $32^{\circ}56'$ Latitude.

The mine can be reached from Ft. Thomas, Arizona by traveling 11-1/2 miles SW up Black Rock Wash to .3 miles west of the YL ranch, turn left up very a /bad trail 2 miles to the lower mine workings.

Mr. Rhodes states that the mine produced approximately 1200 tons that assayed 60-70% CaF_2 and 25-35% SiO_2 . Five surface samples were taken but the underground portion of the mine was not entered as being too dangerous.

Arizona
Fluorite

Rowley

Summary:

This group of six patented claims was not visited as it is described in detail in RI 5651, pp. 41-44. Barite is the chief gangue constituent of the hanging wall portion of a fault zone which has copper, lead, molybdenum, and gold mineralization. The composite of the random samples taken by the Bureau contained 64.0% barite and 3.8% fluorite. The property is not considered to have potential economic fluorite value.

Location:

The Rowley property is on the west flank of the Painted Rock Mountains in the center, S₂, NE₄, sec. 25, T₄S, R₈W, Maricopa Co., with a slight overlap into the SE₄ of sec. 24. The Bureau gives the following road log:

- 0. Gila Bend. Travel west on US 80 from its junction with Arizona Highway 85.
- 14.5 Turn right on the Painted Dam Road.
- 27.1 Turn right (east) onto a desert road.
- 28.0 Arrive at the mine.

The shafts are on the Dendra Valley 15' USGS topographic quadrangle.

Occurrence:

The manner of occurrence of the fluorite is not mentioned in the Bureau's report although it is present in the chemical analysis. The mineralized fault zone has an average strike of N25°W and a dip of 45°E in the underground workings; it is covered by extensive dumps on the surface.

Jan Carol Wilt
July 1975

Arizona
Fluorite

Ruby Patent

Summary:

A small trace of fluorite occurs with minor amounts of U, Pb, Cu, and Zn in rhyolite porphyry. The fluorite is of no economic interest. The property was examined by William Hiest on June 22, 1975.

Location:

The claim is in the S $\frac{1}{2}$, SW $\frac{1}{4}$ of section 8, T23S, R11E, in Santa Cruz County, Arizona. The property is reached by travelling 23.7 miles west on Arizona Highway 289 from its intersection with I-19 to the road leading to the abandoned Ruby mining camp, continuing north 0.7 miles on Highway 289 and then turning left on a dirt road for 1.3 miles southerly to a dam, then walking about 0.7 miles southerly to the claim. The area is on the Ruby 15' USGS topographic quadrangle.

Ownership:

The Ruby patented lode claim is owned by John Godsil, Box 17, Ariwaca, Arizona. The Ruby patent has been erroneously referred to as the Annie Laurie and the error has been carried into the literature.

Geology and Development:

The host rock is rhyolite porphyry which has been brecciated and recemented by calcite veinlets containing minor fluorite, sphalerite, galena, chalcopryrite, and pyrite. Minor uranium mineralization is found in the rhyolite porphyry.

Development consists of about a dozen pits and trenches over an area approximately 600' X 400'. The base map for the examination was from an article in Economic Geology (copy attached) which shows all the pits and trenches of interest.

The only fluorite seen on the property was a trace in pit B. It appears to be a minor accessory mineral and is of no economic interest.

References:

- Anderson, R. Y., and Kurtz, E. B., Jr., 1955, Econ. Geol., vol. 50, no. 2, pp. 227-232.
Wright, R. J., 1951, US Atomic Energy Commission, RMO-677, 7 pp.

Victor E. Kral
November 1975

SILVER KING

Summary:

The Silver King property held by location by the New Jersey Zinc Corporation is situated in the approximate center of Section 1, T4S, R23W (extended), in Yuma County, Arizona. Several minor fluorite occurrences were noted in an andesite host rock near a granite-limestone contact showing no pyrometasomatism. Barite and lead as wulfenite and cerussite is usually associated with the fluorite. The U.S. Bureau of Mines examined this property in 1950 (RI 5651, pp. 88-89) and states that it was then reported that about 200 tons of fluorite had been produced. This is an old silver district reported to have had minor production.

The principal fluorite vein, exposed by small surface cuts, an adit and drift, has been stoped to the surface. A 5.3-foot sample of the face of the drift contains 27.3% CaF_2 , 0.11% Pb, and 0.2 oz. Ag. A bureau sample of this face contained 48.6% CaF_2 .

New Jersey Zinc Corporation has done extensive drilling in the area and apparently intends to retain its claims. The property warrants further exploration as a potential source of reserves to augment others should a mill in the area ever appear feasible.

The property was examined by Victor E. Kral and William C. Hirt on June 13, 1975.

Location:

The Silver King property is in the approximate center of Section 1, T4S, R23W (extended) and is shown as a prospect on a Jeep trail on the Picacho 7½' USGS topographic quadrangle. The property is in Yuma County, Arizona, and is reached from the paved Martinez Lake road by taking the Red Cloud mine road 29.2 miles (0.3 mile past Red Cloud), then take the right fork for 0.95 mile, then take right fork up a canyon (Jeep road) 0.6 mile to the property.

The property is at an elevation of 850 feet in an arid desert climate.

Ownership:

The property is held by mineral location by New Jersey Zinc Corporation who has done considerable drilling in the district and has indicated its intention to retain the claims.

Occurrence:

Although several minor veins of fluorite are noted in the area, the principal vein bears S25°E, dips 45°NE and is exposed by several small surface cuts and a 70-foot cross-cut adit from which drifting is 12 feet northerly and 40 feet southerly. From the area of the cross-cut the vein has been stoped about 50 feet to the surface. The best exposure is in the southern face of the drift; a 5.3 foot sample from here contains 27.3% CaF_2 , 0.11% Pb, and 0.2 oz. Ag. The Bureau's sample from here contained 48.6% CaF_2 . The vein is traced about 400 feet southeast of the workings but has neither the width or grade of that in the drift.

The host rock is andesite although a "cold" granite-limestone contact is noted a few hundred feet south of the principal fluorite and the same contact up a canyon to the northwest has an inclined shaft of about 100-foot depth on a barite-calcite-quartz vein. It is assumed this work was done on silver encouragement.

The general mineralization in the area is fluorite and/or barite with calcite and quartz with which lead, usually as wulfenite and cerrusite, is also found.

The Bureau states that about 200 tons of fluorite production was reported, and E. D. Wilson (Geol. and Mineral Deposit of Yuma County, Az.; Az. Bureau of Mines Bull. 134, 1933 p. 64) states that a few tons of silver ore was produced in 1923.

Conclusion:

Although this is not an important occurrence it may augment other fluorite reserves to aid in justifying a mill at some future date. It does, therefore, warrant further exploration.

Victor E. Kral
October 24, 1975

Snowball Fluorite, Maricopa County, Arizona

Summary:

The Snowball fluorite deposit is situated in the SE $\frac{1}{4}$ Section 29, T5N, R10W, about 20 miles southwest of Aguila, Maricopa County, Arizona. Discovered in 1943, the U. S. Bureau of Mines explored the property in 1949 with 48 trenches and three shallow diamond drill holes. Further exploration from a 100-foot inclined shaft was done later and small shipments of fluorite were made to the cement industry in 1957 and 1958.

The property was examined by Victor E. Kral and William C. Hirt on April 23-25, 1975. Sample results and mapping indicate 6700 tons of 44.6% CaF_2 grade to an assumed depth of 50 feet, and the assumption that one half the projected tonnage will be mineable as fluorite ore. The plan sketch of the workings in five sheets shows the exploration, samples, and general geology. The occurrence is largely in hornfels intruded by diorite wherein diorite is often the principal host rock.

It is anticipated that further exploration will not find appreciable tonnages of additional ore.

Location:

The Snowball fluorite property is situated about 20 miles southwest of Aguila, Maricopa County, Arizona. The mineral is held by a group of unpatented lode claims known as the BHI Spar group. Corners referring to claim numbers 1 through 9 were noted, however, the known fluorite is within the boundaries of BHI Spar Nos. 1 and 2 in the SE $\frac{1}{4}$ Section 29, T5N, R10W. The claims are in the Ellsworth mining district.

Access is from Aguila, on U. S. Highway 60 by travelling on the graded and drained natural gravel Eagle Eye road, then turn westerly 1.5 miles on desert trails and join a road from a windmill and millsite to the south, then travel 0.4 mile northerly, and turn southwesterly 0.3 mile to the workings. The property is shown on the Lone Mountain 15' topographic quadrangle.

The claims are in moderately rolling topography at 2000 feet elevation. Climate is the typical semi-arid of southern Arizona. Vegetation is sparse desert growth. The nearest water is at a well and millsite, also known as the Alaska mine, about 1.3 miles southeast of the fluorite by road; the flow would not be adequate for modern milling.

Ownership:

The claims are owned by the Southern Mines and Milling Co. 5117 N. Scottsdale Rd. Phoenix, Arizona. It appears the claimants are keeping up their assessment work.

History and Production:

U. S. Bureau of Mines Report of Investigation 4540 of September 1949 by T. C. Denton and Chas. A. Kumke reports that the fluorite was discovered in 1943 by D. B. Powell of Aguila. E. A. Elevatorski, in Arizona Fluorspar, published by the Arizona Department of mineral Resources states that small fluorite shipments were made in 1957 and 1958 as a flux in the cement industry. Evidence indicates that some attempt at concentration was made at the millsite previously mentioned.

Ore Occurrence:

The fluorite occurs along a westerly bearing fault zone traceable beyond the mineralization. It is associated with quartz and calcite. As evidenced by the sampling the fluorite mineralization is extremely erratic; it was found to persist at 100 feet below the surface but cut out laterally in the only underground workings on the property.

The principal rock in the area is a limey hornfels associated with some schist to the west and quartzite to the east. The Archean (?) metamorphics have been intruded by a diorite and in some areas the intrusive is the principal host rock. Although the diorite parallels the fault zone in some areas, in others, such as the vicinity of the shaft, it is extremely irregular and seems to have no structural control.

Although the only fluorite having economic potential is found along the main fault zone, some fluorite is found about 450 feet north of the western end of the fault zone mineralization in a fault shear roughly parallel to the main zone. Although much dozing off the fault but within several hundred feet of the fault zone found nothing, it is anticipated that careful prospecting may pick up other parallel fluorite stringers. Such occurrences will probably have little economic significance.

Exploration: (See plan sketch in 5 sheets)

The principal exploration was done by the U. S. Bureau of Mines in 1949 and reported in RI4540 as previously mentioned. The Bureau made 48 trenches, largely by dozer, in addition to several hand dug pits in the trenches. They also drilled three diamond drill holes of 130 to 150-foot depth in what appeared to be the best area of mineralization.

Sometime later a 43° inclined shaft was sunk in the general area of the Bureau's better trenches. The shaft is 100 feet in depth and has 110 feet of drifting off the 53-foot level of the shaft. Stoping, almost to the surface, was done off the drift.

Since the Bureau's work considerable dozer trenching has been done off the vein as well as some on the principal fault zone. Oddly, the later trenching found essentially no additional mineralization. Much of the work off the vein was probably for location work.

Ore Reserves:

The occurrence of fluorite mineralization is erratic laterally along the vein as evidenced by the trenches and the underground workings. It is felt that at best the ore zones outlined by the trench results can be projected to about 50-foot depth and may be expected to contain half the ore calculated from these demensions. It is assumed that some areas will not have a 50% ore recovery, such as shown in the shaft workings, this shortage will be compensated by ore found below the 50-foot depth.

Average grade is obtained by weighting present sampling only. Bureau sample results are used to indicate continuity of mineralization only.

Four ore blocks are postulated, from east to west; in all calculations the 50% ore factor and 50-foot depth, mentioned above, and a density of 12.3 cu. ft./ton are used.

Trenches	No.	Samples %CaF ₂ width		Dimensions in feet depth length width		
<u>Block No. 1</u>						
6	1	53.3	4.0 ft.	50	70	4.1
6-7	2	34.6	4.0 ft.			
7	3	50.2	4.3 ft.			
				570 tons	46.1%	CaF ₂
<u>Block No. 2</u>						
15	4	50.2	5.5	50	320	3.4
16-17	17	47.7	2.6			
shaft	5	27.5	4.3			
"	6	52.7	3.0			
"	7	36.5	2.0			
"	13	50.6	4.2			
19-20	12	61.7	2.0	2210 tons	46.0%	CaF ₂
<u>Block No. 3</u>						
24	16	32.7	5.1	50	310	4.4
25	8	51.2	2.5			
27	15	45.9	5.5			
30	9	51.2	4.3			
				2770 tons	44.1%	CaF ₂
<u>Block No. 4</u>						
37	10	39.4	6.6	50	110	5.3
near 38	11	48.8	5.6			
39	14	39.2	3.7			
				1180 tons	42.7%	CaF ₂

Total estimated reserves are 6700 tons of 44.6% CaF₂ grade.

Conclusions:

The 6700 tons of 44.6% CaF_2 grade delineated in the Snowball fluorite property is only enough to help operate a centralized concentrator. Little additional tonnage may be added by further exploration. Minor additional occurrences, such as already found, may be added by careful prospecting; they are not expected to add appreciably to the reserves.

Victor E. Kral
September, 1975

Arizona
Fluorite

Sure Fire

Summary:

A trace of fluorite is found as joint and fracture fillings in schist. The fluorite seams are less than 1/8" thick and are rare. The property is of no interest for fluorite, but is reported to be a uranium prospect. The property was examined on June 19, 1975 by William Hirt.

Location:

This claim is located in the N $\frac{1}{2}$, SW $\frac{1}{4}$ of Sec. 15, T13S, R18E about 30 miles northeast of Tucson, Pima County, Arizona. It can be reached by taking Tanque Verde road east from Tucson, continuing on it as it turns into Redington Road. Continue 4.4 miles past the Bellota Ranch Road, then turn right and follow a dirt road about 3 miles to the claim. The area is on the Reddington 15' USGS topographic quadrangle.

Ownership:

No evidence of ownership was found.

Mineralization and Development:

Granite and schist are the host rocks for mineralization of calcite, fluorite, and quartz. There is only a trace of fluorite at this property - it consists of knife-edge seams along joints and/or schistosity planes in the schist, and is of no economic interest.

Exploration consists of one 50-foot shaft, 4 adits (short), and several pits.

Swansea Area

Summary:

Shear zones in basalt and limestone contain minor copper oxides and silicates and purple fluorite of no commercial interest. The area was examined by Victor Kral and William Hirt on May 8, 1975. No fluorite mineralization of commercial potential was found.

Location:

These claims are located in SE/NW section 31, T10N, R15W in the Buckskin Mountains near the ghost town of Swansea. They can be reached by taking the Swansea road northeast from Bouse, Arizona for 25.7 miles (about one mile before the ruins of Swansea). Then turn left (north) for about half a mile to the workings. This area is on the Swansea 15' USGS topographic quadrangle.

Ownership:

No indication of ownership was found and those persons knowledgeable of the occurrence know nothing about the ownership, if any.

Mineralization and Development:

Country rocks are basalt and limestone intruded locally by granite and a very fine grained basic rock. Shear zones 5-8 feet wide are weakly mineralized with copper oxides and silicates and purple fluorite, which commonly is brecciated. The fluorite mineralization is low-grade and irregular. One sample 3.9 feet long was taken in a small incline sunk on a shear zone on the highest grade fluorite exposure found. This sample ran 22.6% CaF_2 .

Some knife-edge fractures filled with purple fluorite and copper stains were also found.

The mineralized zones are exposed in several shafts, small inclines, pits, trenches, and an adit.

The irregular and low-grade nature of the fluorite mineralization would preclude any mining.

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West End - Good Luck

Summary:

The principal workings of this mine are in the NE/NE/NE of section 12, T6N, R5W. They are about 6 airline miles south of Wickenburg, Maricopa County, Arizona. To reach the property from Morristown on U.S. 60 travel northwesterly 6.9 miles, then turn left up a wash 0.9 mile to the workings shown on the Wickenburg 7½' USGS topographic quadrangle.

Production dates from 1927 and about 20,000 to 25,000 tons of fluorite is reported to have been shipped from here.

Workings are all relatively shallow, production being largely from less than 75-foot depth. The principal host rock is an amphibolite sericite schist intruded by diorite.

The vein, traceable for 1500 feet, has been explored by trenching and much of it has been stoped in both directions from the principal shaft. Characteristic of such fluorite workings, no attempt has been made to explore by shallow drilling. This property and the area in general warrants further exploration. No known ore reserves appear to be left in the workings.

Introduction:

The West End - Good Luck is combined herein as it is on the same vein, with the same ownership, and referred to as the same property by the owner. A U.S. Bureau of Mines road access application report map of 1943 shows the properties separately probably because about 500 feet of unexplored area separates them. The property was examined by William C. Hirt and Victor E. Kral on May 2, 1975.

The principal shaft is situated in the NE/NE/NE of section 12, T6N, R5W and is shown on the Wickenburg 7½' USGS topographic quadrangle. The property is 6 airline miles south of Wickenburg and is reached from Morristown, Maricopa County, Arizona, on U.S. 60, by driving 6.9 miles northwesterly, then turning left up a wash 0.9 mile to the workings. This road goes past the old Garcia gold property on the right, mislabeled on the quadrangle as the Mammoth Spar Mine.

Early production from here was made by L. Foster, who shipped fluorspar from here as well as the nearby Jumbo mine in 1929. The owner, J. D. Campbell of Wickenburg, reports that 20,000 to 25,000 tons of ore has been shipped from this property; most of this was shipped by Campbell.

Occurrence:

The vein which strikes about N55°W and dips 60° southwest is in an amphibolite sericite schist intruded by diorite. At the extreme west end of the deposit the schist grades into hornfels. Although the main shaft is reported to be 100 feet deep the fluorite is said to have been largely above

Arizona
Fluorite

West End - Good Luck cont.

75-foot depth. The mined vein appears to have been up to 5 feet thick. The vein is traced by extensive test pitting and trenching for about 1500 feet and it appears that several hundred feet has been stoped. All but surface workings are now inaccessible. Only narrow segments of the vein are left and it appears that no known ore reserves remain.

Conclusions:

As exploration was only by surface work it appears that shallow drilling to explore the vein at about 50 to 60 feet would be warranted. The general area has other unexplored fluorite occurrences that warrant attention.

Victor E. Kral
December 10, 1975

White Christmas

Summary:

A minor occurrence of fluorite associated with barite as is common in the area; no potential commercial fluorite value. Examined by William C. Hirt and Victor E. Kral on May 8, 1975, (see RI 5651, pp. 65-66).

Location:

In the SW/SE Sec. 12, T7N, R17W, in Yuma County, Arizona; about 3½ miles NE of Bouse at end of road marked as Jeep trail on Utting 15' topographic quadrangle. Can also be reached by traveling 2.5 miles NE out of Bouse on the Swansea road, then 0.9 miles easterly on a good bladed road and walking 0.75 miles S-SE to a few small trenches.

Ownership:

No evidence of ownership found.

Occurrence:

A shear zone containing several veins of barite up to 1.5 feet wide with a few minor fluorite seams less than ½" thick in and near the barite, all striking N45°W. In basalt overlying limestone at an estimated depth of 50 feet or less. No samples were taken.

Arizona
Fluorite

White Prince

Summary:

The White Prince claim was not visited as it is described in RI 5651 (Barite). A character sample taken by the Bureau assayed 60.6% barite and 2.6% fluorite, although more fluorite is present in the west part of the outcrop. The property is not considered to have potential economic fluorite value.

Location:

According to the Bureau, the claim is on the west flank of the Quijotoa Mountains in approximate sec. 17, T15S, R2E, unsurveyed, of the Papago Indian Reservation, Pima Co., Arizona. The Bureau gives the following road log:

- 0 South Tucson. Drive west on Arizona Highway 85 from its junction with US 89.
- 77.8 Turn west on a semigraded dirt road.
- 81.3 End of road at a windmill and tank.
Walk south on a foot trail for 2 miles, cross over the saddle at elevation 3600 feet and go down the south-west side of the mountain to the deposit at the approximate elevation of 3300 feet.

The claim area is on the Quijotoa Mountain 15' USGS topographic quadrangle.

Occurrence:

A wedge of limestone, which is in fault contact with andesitic rock, has been metamorphosed to coarsely crystalline calcite and has been mineralized with barite and minor amounts of fluorite. The limestone is exposed over an area approximately 100 feet by 70 feet, with patches of barite-bearing limestone visible for more than 100 feet beyond it. A nearby deposit of barite in a vertical fracture zone in andesite assayed 69% barite and 0.2% fluorite.

Van Carol Wilt
July 1975

White Rock

Summary:

This is a barite occurrence with only minor fluorite situated about 18 miles southwest of Aguila about one half mile east of the Eagle Eye road. It is of no interest for fluorite but may be a potential barite deposit. It is fully described in RI 5651, pp. 39-40. The property was examined by Victor E. Kral and William C. Hirt on April 30, 1975.

Location:

The occurrence is reached from Aguila by traveling southwest 17.3 miles on the Eagle Eye road then turn east on a short trail and walk up a canyon on an old Jeep trail about 0.6 to 0.8 miles. Barite float will be noted and outcrops up to about a foot in thickness may be found about a quarter mile above the road on both sides of the canyon. The barite veins occur in swarms in the SW/NW and NW/SW of Sec. 35 T5N, R10W, Maricopa County, Arizona, and one on the Lone Mountain 15' USGS topographic quadrangle.

Ownership:

No evidence found, probably open ground.

Occurrence:

The barite, with only traces of fluorite, occurs in a basaltic volcanic flow.

Conclusions:

It is doubtful that this has potential as barite and definitely has no fluorite potential.

Victor E. Kral
July 1975