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THE PAPSYS HOPE AUTUNITE PROSPECT
MARYSVALE DISTRICT
PIUTE COUNTY, UTAH

July 1950

Trace Elements Memorandum Report 145

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Sincerely yours,

/s/

H. B. Bannerman
Acting Chief Geologist

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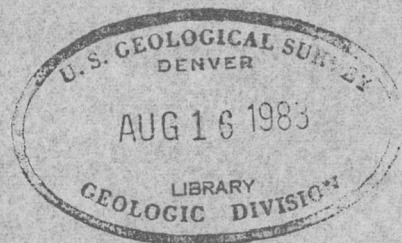
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MARYSVALE DISTRICT,
PIUTE COUNTY, UTAH

By

Edward R. Kaiser

July 1950

Trace Elements Memorandum Report 145



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THE FAPSY'S HOPE AUTUNITE PROSPECT

MARYSVALE DISTRICT,

PIUTE COUNTY, UTAH

By

Edward P. Kaiser

Abstract

The Fapsy's Hope autunite prospect is in the eastern part of the Marysvale district, Piute County, Utah, about 1½ miles northeast of the mines now operating. It is developed by two shallow cuts and a short inclined shaft. One cut exposes a zone of fractures, sparse quartz veins, and scattered autunite. Most of the autunite is exposed within a north-south distance of 17 feet. The trend of the zone is not known. Samples across the autunite-bearing zone average 0.026 percent equivalent uranium.

The deposit is in feldspar porphyry of the older Tertiary (Bullion Canyon) volcanics. The intrusive quartz monzonite that contains the deposits now being mined is in contact with a quartz porphyry similar to the rocks exposed about 1500 feet west of the Fapsy's Hope prospect.

In comparing the Fapsy's Hope prospect with the deposits now being mined, two major correlations have been observed. (1) The deposit at the Fapsy's Hope prospect and those at the Bullion Monarch and Prospector mines are immediately beneath the old erosion surface at the base of the younger Tertiary volcanics. The younger

volcanics are still present a short distance to the north and south of the Papsy's Hope prospect. (2) The deposits at the Papsy's Hope prospect and at the Prospector mine are associated with completely silicified outcrops. These correlations may prove of value for prospecting, and further study of them is in progress.

Further prospecting would be necessary to determine the trend of the autunite-bearing zone and to expose it at greater depth. This could be done by trenching across the probable northeast-southwest trend of the zone, by drilling, and by either extending the present inclined shaft or, preferably, driving a new incline at a lower level.

Introduction

As a part of the Geological Survey's study of the Marysvale district, E. F. Kaiser, H. L. Bauer, and F. L. Klinger, of the Geological Survey, examined and mapped the Papsy's Hope prospect in June 1950. The prospect is on one of a large group of claims owned by J. F. Fullmer of Marysvale and others. Mr. Fullmer submitted samples to the Geological Survey at Marysvale.

The prospect may be reached by passenger car in dry weather. It is at an altitude of about 7200 feet, in the middle of section 25, T. 26 S., R. 4 W., Salt Lake Meridian, Piute County, Utah, about $4\frac{1}{2}$ miles northeast of Marysvale and about $1\frac{1}{2}$ miles northeast of the operating mines of the Marysvale district (fig. 1).

Development work consists of two bulldozer cuts about 6 feet deep and an inclined shaft 41 feet long (figs. 2 and 3). No development work or mining was in progress at the time of this examination.

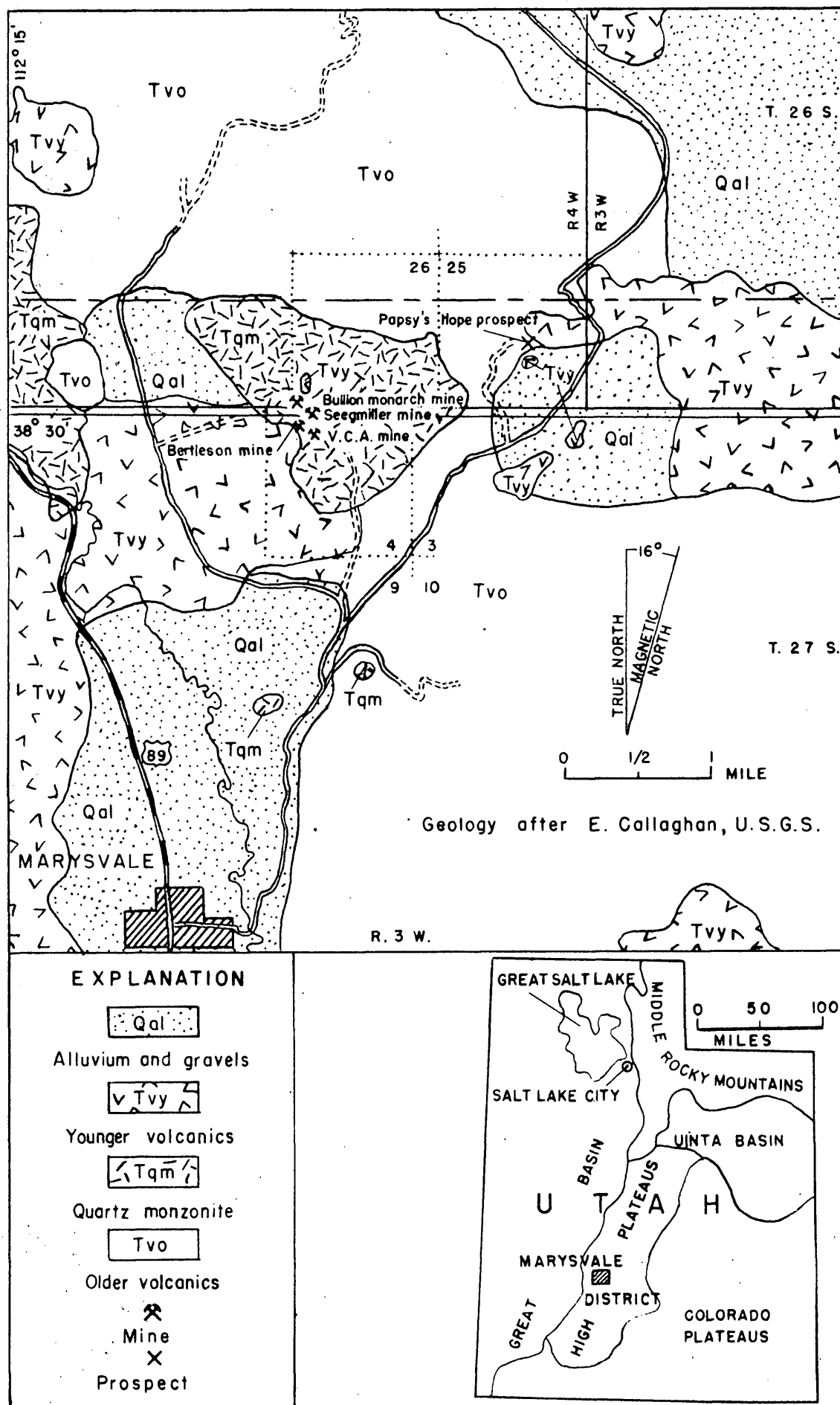


FIGURE 1.—INDEX MAP, MARYSVALE DISTRICT, UTAH.



Geology

General geology.—The mineral deposit is in a feldspar porphyry that underlies several square miles around the Papsy's Hope prospect. The feldspar porphyry is part of the Tertiary Bullion Canyon volcanic series, which underlies the major part of the Marysvale district //.

// Callaghan, L., Volcanic sequence in the Marysvale region in southwest-central Utah: Am. Geophys. Union Trans. 20th Ann. Mtg., Pt. 3, pp. 438-452, 1939.

The Bullion Canyon volcanics are intruded by quartz monzonite and related igneous rocks, which are exposed in two large areas and several small areas in the Marysvale district (fig. 1). The monzonite body exposed in one of the large areas contains the mines now producing uranium ore. The contact of this monzonite body with the Bullion Canyon volcanics is exposed about 1500 feet west of the Papsy's Hope prospect, and the monzonite has probably metamorphosed the volcanics near the contact of the two rocks to form the feldspar porphyry exposed in this area.

Younger Tertiary volcanic rocks occur in the Marysvale district. They lie on an old erosion surface cut into the monzonite and the Bullion Canyon volcanics. As no definite age within Tertiary time has been determined for any of these rocks, the post-monzonite rocks are called the "younger Tertiary volcanics", and the pre-monzonite rocks are called the "older Tertiary volcanics" (fig. 1).

Old erosion surface.—The distribution and attitude of the younger Tertiary volcanics indicate that they were deposited on a hilly erosion surface and that the position of the major ridges and valleys was, at least in part, essentially the same as that of today. This is especially well shown near the Papsy's Hope prospect, and also in the area about half a mile to the northeast, in sec. 30, T. 26 S., R. 3 W., where a trough-shaped remnant of well-layered younger volcanics lies within the present valley. In the latter area, dips locally as steep as 70 degrees indicate that folding or faulting has tilted the rocks, but no definite evidence of faulting has been observed in this area.

Mount Belknap quartz porphyry of the younger Tertiary volcanics crops out about 300 feet north of the Papsy's Hope prospect and also at the base of the steep slope south of the prospect (fig. 2). The distribution and attitude of the younger volcanics suggest that the old erosion surface was only a short distance above the present surface at the Papsy's Hope prospect and on the slope to the south (Section A-A', fig. 2).

The deposits at the Bullion Monarch and Prospector (V.C.A.) mines in the central part of the Marysvale district also lie immediately beneath the old erosion surface and beneath the younger volcanics. As no detailed geologic mapping has been done at these mines, no definite correlations can be made between the autunite deposits and the old erosion surface.

Alteration

The feldspar porphyry at the Papsy's Hope prospect is partly altered to clay minerals, but the relative importance of hypogene and supergene alteration is not known. Study of the alteration pattern at the operating mines is expected to throw some light on the relation of alteration to mineralization.

Silicification.—Completely silicified and commonly iron-stained rock crops out at several places in the Marysvale district, and several knobs and ridges near the Papsy's Hope prospect are capped by outcrops of this rock. The primary textures of the rock are commonly destroyed, but locally the completely silicified rock has a texture similar to that of the feldspar porphyry.

The Papsy's Hope prospect cuts are on the west and south sides of a knob of completely silicified rock about 40 feet in diameter. The distribution of similar rock in the surrounding area suggests that it is associated with the old erosion surface and that it was produced in the zone of weathering of the old erosion surface. Accordingly the silicified rock is tentatively considered to form a cap rather than a cross-cutting body (see Section A-A', fig. 2). The rock exposed in the shaft is locally slightly silicified but contains no completely silicified material.

It is possible that the silicified rock was produced by weathering of a vein or zone previously enriched in silica by hydrothermal action. If this relation is confirmed by further study, the siliceous caps may prove to be of value as guides to prospecting.

On the other hand, the zones of silicification may be connected with supergene phenomena related to the younger volcanics and the surface of their contact with the older volcanics.

Completely silicified rock occurs on the surface over the Prospector (V.C.A.) mine, but the lack of detailed geologic mapping in that area precludes a definite conclusion from these possibly significant relations.

Mineral deposits

The cut on the western side of the knob at the Papsy's Hope prospect exposes altered feldspar porphyry cut by minor fractures and mineralized with clearly visible autunite over a horizontal distance of about 17 feet (fig. 3). Fractures trending N. 55° - 70° W. and N. 50° - 65° E are common, and some of the fractures contain dark gray dense quartz veins about one-half inch thick. Autunite is irregularly distributed on fracture surfaces. Samples were taken across the zone.

The trend of the mineralized zone is not known because of insufficient exposure. The rock in the inclined shaft (fig. 3) is not abnormally radioactive and does not contain any autunite. By analogy with the Prospector mine, the mineralized zone at the Papsy's Hope prospect may trend about N. 65° E. If this is true, the inclined shaft does not extend far enough north to reach the position of the mineralized zone projected in that direction.

The aerial photographs of this area show a series of colored bands dipping steeply south and striking N. 60° - 70° E. These

may reflect structures related to the mineralization.

Autunite occurs in an area about 15 inches in diameter on the north wall of the cut on the south side of the knob (fig. 3). No samples were taken at this place.

Sampling and grade

Four samples were taken on a line waist-high along the eastern face of the cut on the western side of the knob. The distribution of the samples is shown in figure 3. Each sample consists of a number of small grab samples taken at 6-inch intervals along the line. Samples EHK 1-2 and EHK 1-3 represent the main autunite-bearing zone. Sample EHK 1-1 is south of the zone, and sample EHK 1-4 is north of the zone. Results of analysis of the samples are given below.

Equivalent uranium content of samples from Papsy's Hope prospect

<u>Sample number</u>	<u>Sample length</u>	<u>Equivalent uranium</u>
EHK 1-1	10 feet	0.024
1-2	10 feet	0.024
1-3	7.5 feet	0.030
1-4	38.5 feet	0.013

The grade of the main mineralized zone, as shown by samples 1-2 and 1-3, is 0.026 percent equivalent uranium.

Suggestions for prospecting

The Papsy's Hope prospect contains a shallow exposure of a low-grade autunite-bearing zone whose trend is not known. More exposure along the northeast-southwest trend of the zone and at greater depth is obviously required to determine its vertical and horizontal extent.

By analogy with the Prospector mine, the trend may be about N. 65° E.

Should further prospecting be contemplated, trenches should be dug across the possible extension of the zone to the northeast and southwest of the present exposure to determine the trend of the zone on the surface.

Possible underground extensions of the zone could be exposed either by extending the present incline, sinking a vertical shaft, or driving a new incline from south or west of the exposure. Extension of the present incline shaft for about 50 feet would intersect the projected position of the autunite-bearing zone on a level about 60 feet vertically lower than the cut. An inclined shaft trending northward and, therefore, probably cross-cutting the zone would, however, give the most information.

The value of drilling is doubtful because core recovery would probably be poor, but good drill stations are available on the slope south of the cuts.

Conclusions

Geologic study of the Lacey's Hope prospect indicates that the zone of visible autunite and the completely silicified rock may be related to the old erosion surface. The silicification may in turn be related to hydrothermal action and to ore-forming processes and may be of some value as a guide for prospecting. The lack of detailed geologic mapping in and near the producing mines of the district makes these correlations uncertain, but study of them is continuing.

The autunite-bearing zone of the Lapsy's Hope prospect is low-grade, but further development may, as in the Bullion Monarch mine, expose material of higher grade.