

THE GEOLOGICAL SURVEY OF WYOMING
Gary B. Glass, State Geologist

MINERAL REPORT 87-1

THE BONNEVILLE PEGMATITE CLAIMS,
COPPER MOUNTAIN, FREMONT COUNTY, WYOMING

by

Ray E. Harris

Laramie, Wyoming

1987

This report has not been reviewed for conformity with the editorial standards of the Geological Survey of Wyoming.

**The Bonneville pegmatite claims,
Copper Mountain, Fremont County, Wyoming**

The Bonneville Pegmatite claims are located over a group of northeast-southwest trending pegmatites located in sections 21, 22, 27, and 28, T.40N., R.93W., Fremont County, Wyoming (map attached). These claims are located on the U.S. Geological Survey Birdseye Pass and Guffy Peak 7 $\frac{1}{2}$ -minute topographic Quadrangles. Access to the claims is via a graded dirt road that leaves U.S. Highway 20 3 $\frac{1}{2}$ miles north of its junction with the paved road to Bonneville. Follow the graded dirt road east and northeast from U.S. Highway 20 about 9 $\frac{1}{2}$ miles to the intersection of another graded dirt road that parallels a set of power lines. Follow that road one mile east, then one mile north along an ungraded dirt trail to the spring in the center of section 28, then east $\frac{1}{2}$ mile on an intersecting ungraded road to the base of the Bonneville #1 pegmatite. Direct access to the Bonneville Claims from the south through the Quien Sabe Ranch is prohibited by the ranch owner as of this date. Four-wheel drive is advisable, though two-wheel drive high clearance vehicles can get to the area in dry weather.

The first mining in this area took place in 1906, when some muscovite was removed from several pegmatites. Beginning in 1910, and continuing intermittently to 1940, small amounts of feldspar, beryl, mica, lepidolite, and tantalite have been removed (McLaughlin, 1940). In 1969 and 1970 the Wyospar Division, Northwestern Feldspar Corporation, produced feldspar from the area, and developed the Quien Sabe underground feldspar mine located $\frac{1}{2}$ mile northeast of the Bonneville Claims. In 1972, Modern Mining and Milling began to produce feldspar from the area. Prior to 1980, the claims were known as the Whippet

Prospects. In 1980 and 1981 Concepts West, Incorporated, reported feldspar production from the Bonneville #1 Mine (now the pit on the Bonneville #1 claim). The claim names were changed to the Bonneville claims by the present owner in 1981. Two hundred tons of feldspar were produced in 1980, and ninety tons were produced in 1981 (Wyoming State Inspector of Mines 1969-1982 annual reports). No feldspar has been produced since 1981.

Eight claims (Bonneville 1-8) make up the present claim group. The pegmatites on the Bonneville Claims 1, 2, 7, and 8 were examined for this report in October, 1986. The pegmatites on Bonneville Claims 3, 4, 5, and 6 were not visited, but are reported by the claim owner to be similar to the pegmatites examined. These claims are located on a series of approximately N60° east-trending quartz-microcline-muscovite pegmatites intruded concordantly into regionally metamorphosed schists, phyllite and gneisses of Precambrian age. Precambrian granite occurs in small areas. Some of the pegmatites extend for more than 1,000 feet along strike and may be more than 150 feet wide. They form a group of subparallel bodies extending from the west-center of section 28 to the center of section 22. The pegmatites are well-exposed, as is the country rock in the area of the Bonneville Claims. The pegmatites in this area are also described in McLaughlin (1940) and Hanley and others (1950), but the maps in those publications do not agree, nor do they agree with observations made for this report. Hanley and others (1950), McLaughlin (1940) and Hausel and others (1984) describe the geology of the country rocks in the area.

The Bonneville #1 claim is developed by a bulldozed pit in a large pegmatite (about 50 feet in width) located just north of the center of section 28, at the end of a graded access road. Beryl and tantalum minerals are being hand-cobbed from the rock after blasting and dozing, and small amounts of beryl have been

shipped in the past two or three years to the Brush-Wellman beryllium recovery plant in Delta, Utah. Beryl crystals several feet in diameter and length occur here. These beryls are light green to yellowish green and contain scattered muscovite flakes. With the exception of their size, they are not valuable as specimens since they are opaque and easily fractured, but are valuable as an ore of beryllium. Columbite-tantalite crystals (mineralogy determined by x-ray diffraction, and ARC emission spectrometry - see attached laboratory report 850826) up to four inches by four inches by one inch in size have been found in this pegmatite. Pyrochlore-microlite and tapiolite have also been identified in this pegmatite (see attached laboratory report 861010). The pegmatite in the pit contains an elliptical area of beryl crystals in a quartz-feldspar matrix, surrounded by a tantalum-beryl zone in a feldspar matrix which is in turn surrounded by the quartz-feldspar-muscovite mineralogy of the main body of the pegmatite. The elliptical body that contains the beryl crystals is not in the center of the pegmatite. Tantalum minerals occur in other elliptical and tabular areas in the pegmatite body. Hanley and others (1950) report that columbite (containing 48 percent Ta_2O_5 and 34 percent Nb_2O_5) is also present in a pegmatite at this locality. McLaughlin (1940) reports that columbite, cleavelandite and tourmaline are present in a pegmatite at this locality.

The pegmatite that is found on Bonneville Claims 1 and 2 was examined along strike to the northeast for about 500 feet. Smaller pods containing beryl and tabular tantalum-rich zones are present, and lithium-bearing minerals (lepidolite and possibly petalite) were noted. These occur in irregular pods, three to four inches in which diameter contain $1/4$ inch by $1/4$ inch lepidolite flakes. The dike thins to the northeast, pinching out in one place. This pegmatite continues beyond the pinchout to the top of the ridge in the NE $1/4$ of section 28.

The Bonneville Claim 7 is located in the SW¹/₄NW¹/₄ section 27 on the north-facing slope of a ridge, near the ridge crest and adjacent to a prominent gap. The pegmatite exposed on this claim is a quartz-microcline-muscovite body about 20 feet wide. The length of this pegmatite was not determined, but it is shown by McLaughlin (1940) to extend only 50 feet along strike. No tantalum bearing minerals or beryl were observed; however, clear rose quartz is found in a three by six inch pod in this pegmatite. The extent of the rose quartz at depth is not known.

Bonneville Claim 8 is located in the SW¹/₄SW¹/₄ section 22, and just within the NW¹/₄NW¹/₄ of section 27. The pegmatite on this claim varies in width from a wedge edge to 20 feet. It contains pods and tabular zones parallel to its length that contain abundant petalite, aquamarine beryl, tapiolite, tantalite-columbite, and pyrochlore-microlite (see attached laboratory report 861010). A conspicuous tabular zone three feet in width extending along strike for 50 feet or more consists of 20 percent tapiolite (identified by x-ray diffraction, see attached laboratory report 861010) with pyrochlore-microlite reaction rims. Aquamarine beryl encased in white quartz and feldspar forms a zone measuring about ten feet by ten feet in another part of the pegmatite. The beryl crystals are up to six inches long and 3/4 inch in diameter. They are difficult to remove from the other pegmatite minerals. Currently they are being hand-cobbed for sale as mineral specimens. The tapiolite crystals would also make excellent specimens for collectors due to their size (up to 1/2 inch in length) and well-developed crystal forms, as would the large petalite (four inches by three inches by one inch) and (one inch by 1 inch by 1/2 inch) fan-shaped tantalite-columbite crystals.

The size of the tantalum, columbium, beryl, lithium, and other resources in the pegmatites in this area is not known. The occurrences are irregular

within each pegmatite, although very high grade pockets are present. Any exploration program should encompass all of the related pegmatite bodies in the area. All of the mineral resources present in the pegmatites, including tantalum, columbium, feldspar, beryl, lithium, and quartz, should be considered when evaluating the pegmatites for development. A detailed mapping program is also needed. The use of air photographs on which the pegmatites should stand out since they are white and the country rock is dark colored may expedite mapping.

References

- Hanley, J.B., Heinrich, E.W., and Page, L.R., 1950, Pegmatite investigations in Colorado, Wyoming and Utah: U.S. Geological Survey Professional Paper 227, 125 p.
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- Hausel, W.D., Graff, P.J., and Albert, K.G., 1984, Economic geology of the Copper Mountain supracrustal belt, Owl Creek Mountains, Fremont County, Wyoming: Geological Survey of Wyoming Report of Investigations 28, 33 p.
- Wyoming State Inspector of Mines, 1964-1982, Annual reports: Office of the State Inspector of Mines, Rock Springs, Wyoming.

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LABORATORY TECHNICIAN
JAY T. ROBERTS

LABORATORY REPORT

Client Sample No.:

WGS Sample No.: 850826

Client: Ray Harris

Sample Description:

dense, tabular habit, dull grey-black to
brown-black, non-magnetic
with some muscovite (?)

Analyses Requested:

id mineral

Methods & Results:

XRD: Columbite-Tantalite (position in series indeterminate by XRD)
+minor muscovite
+minor quartz

ARC EMISSION SPEC: qualitative

<u>element</u>	<u>intensity</u>	
Nb	VS	
Ta	S	VS = very strong
Fe	S	S = strong
Al	S	M = moderate
Mn	S	W = weak
Mg	M	
Si	S	
Cu ?	M	

EDXRF, qualitative:

<u>element</u>	<u>intensity</u>
Ta	VS
Nb	S
Fe	VS
Mn	S
Si	W
Ca	W
Ti	W

SPECIFIC GRAVITY = 6.24

Analyst: *Jay Roberts*

Date February 4, 1987

small sample retained in permanent lab reference, remainder to REH

WGS Sample No.: 850826

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- PETROLEUM

LABORATORY TECHNICIAN
JAY T. ROBERTS

LABORATORY REPORT

Client Sample No.: Bonneville

WGS Sample No.: 861010

Client: Ray Harris

Sample Description:

- A: Bonneville 8C, chalky, white, tabular
- B: Bonneville 8B, split wedge xl, dull brown-black
- C1: Bonneville 8A, Black, orthorhombic(?) xl
- C2: Bonneville 8A, dull brown to black where fresh
- C3: Bonneville 8A, v. soft, friable brown weathered residue scraped from cavity
- C4: Bonneville 8A, dull black, red-brn streak
- D1: Bonneville #1, tabular black grain
- D2: Bonneville #1, shallow sample of brown coating on dull brown grain (sample locations noted on rocks)

Analyses Requested:

mineral id

Methods & Results:

X-ray diffraction:

A = Petalite, $LiAlSi_4O_{10}$ + trace quartz

B-D2, Relative Diffraction Intensity:

Sample #	Pyrochlore/ Microlite	Tapiolite	Columbite/ Tantalite	Unknown*
B	11	0	100	7
C1	25	100	0	33
C2	45	100	0(?)	3
C4	7	100	0	6
D1	16	100	0	trace
D2	100	69	0	trace

C3 = plagioclase + quartz + trace pyrochlore (?)

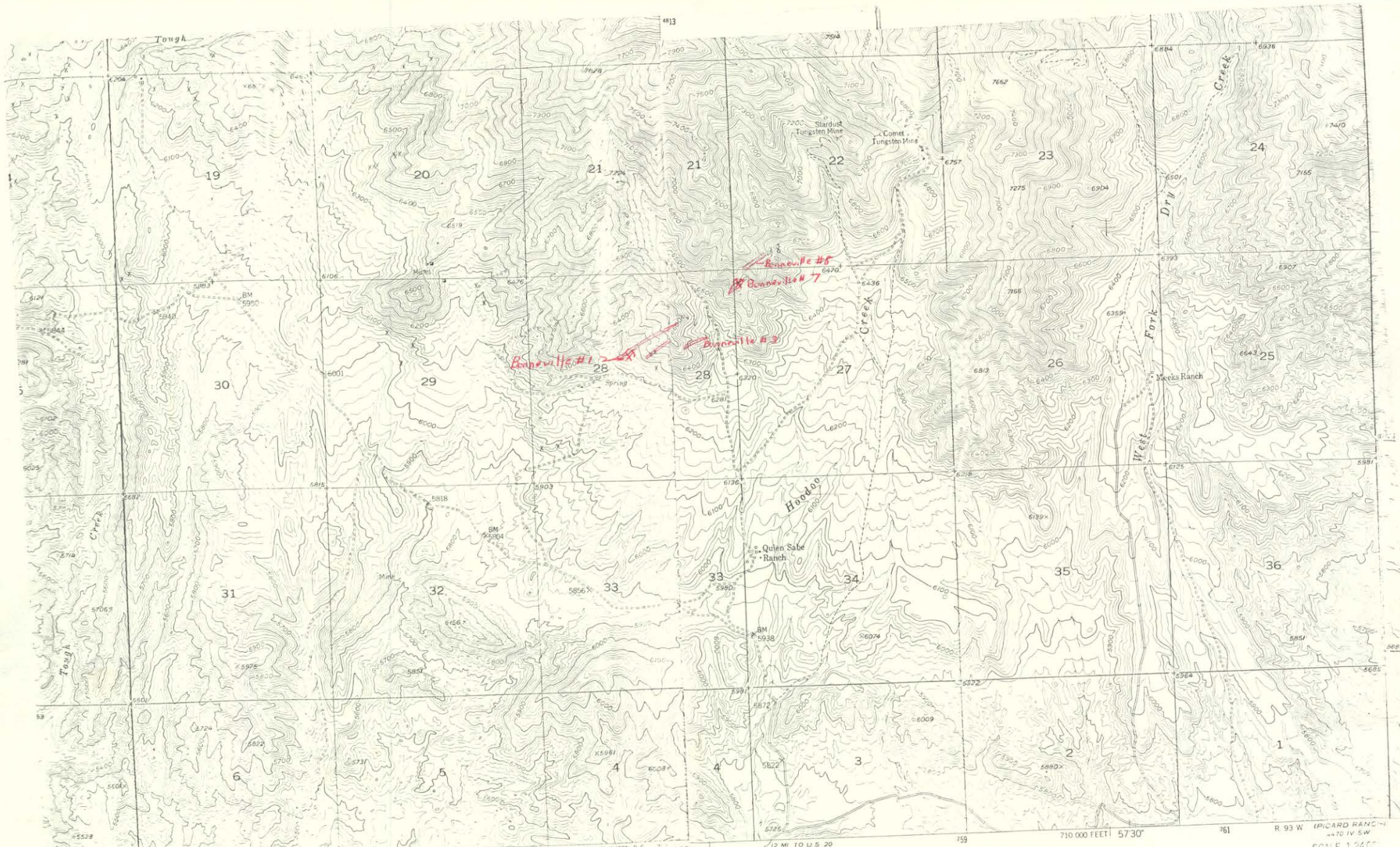
* Unknown = possible plagioclase, lepidolite and/or muscovite contamination of sample from host rock. Possible Betafite.

Analyst: Jay Roberts

Date: October 21, 1986

Excess Sample: returned discarded store 90 days, discard store permanent

WGS Sample No.: 861010 Bonneville

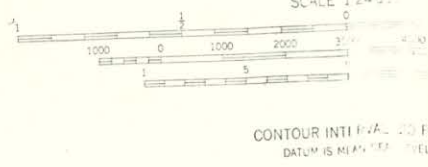
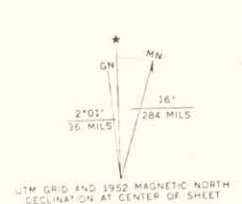


MAP ACCURACY STANDARDS
 COLORADO 80225, OR WASHINGTON, D. C. 20242
 AND SYMBOLS IS AVAILABLE ON REQUEST

BIRDSEYE PASS, WYO.
 N4322 5-W10850/7.5
 1951
 AMS 4370 1 NI SERIES V874

ROAD CLASSIFICATION
 Heavy-duty 4 LANE 6 LANE Light-duty
 Medium-duty 4 LANE 6 LANE Unimproved dirt
 U. S. Route State Route

Map, edited, and published by the Geological Survey
 is part of the Department of the Interior program
 or the development of the Missouri River Basin
 Control by USGS and USC&GS
 Topography from aerial photographs by multiplex methods
 Aerial photographs taken 1949. Field check 1952
 Polyconic projection. 1927 North American datum
 10,000-foot grid based on Wyoming coordinate system,
 west central zone
 All mines on this map are inactive
 1000 meter Universal Transverse Mercator grid ticks,
 one 13, shown in blue



THIS MAP COMPLIES WITH NATIONAL MAP ACT
 FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER
 A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND

*Location Map
 Bonneville Claims MR-87-1*