

WYOMING STATE GEOLOGICAL SURVEY

**FIELD RECONNAISSANCE OF THE PALMER
CANYON CORUNDUM-KYANITE-CORDIERITE
DEPOSIT, LARAMIE MOUNTAINS, WYOMING**

by

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MINERAL REPORT MR98-1

1998

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

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INTRODUCTION

The Palmer Canyon cordierite-corundum-kyanite occurrence was investigated by the author in 1996, as part of an on-going investigation of potential gemstone deposits in the State. Prior to this investigation, the deposit apparently had never been evaluated for gemstones.

The Palmer Canyon occurrence had originally been prospected for vermiculite. According to Osterwald and others (1966), vermiculite was found in biotite schist at what was known as the Roff vermiculite deposit. The schist trends N80°E and dips 65°SW, and was described as a large xenolith surrounded by gneissic granite. Vermiculite was accompanied by chlorite, kyanite, and corundum (Osterwald and others, 1966).

According to Hagner (1944) the Palmer Canyon schist was originally hornblende schist assimilated by granite and altered to biotite schist. Hagner further suggested that the kyanite and corundum resulted from the intrusion of pegmatite into the schist. However, due to the presence of a distinct metamorphic mineral assemblage, the author interprets the source of the porphyroblasts to be due to prograde metamorphism of pelitic sediments, which resulted in biotite-kyanite-corundum schist, biotite-sillimanite schist, and biotite-cordierite schist.

Location & Accessibility

The Palmer Canyon deposit is located about 18 miles west of Wheatland in the Laramie Mountains (Figure 1). Palmer Canyon is accessible by driving west from Wheatland along Platte County Road 204. Within one mile of the deposit, the improved

road turns into graded road (Albany County Road 721) at the Albany County line. The property is located within the national forest boundary in Albany County in the NW section 18, T24N, R70W (Figure 2), and is part of the True Ranch (Earle Stewart, personal communication, 1997) (*Maps showing the area include Reese Mountain 1:24,000, and Laramie Peak 1:100,000 quadrangles*).

MINERALOGY

Near the western edge of the Palmer Canyon property, a small prospect pit was dug in the vermiculite schist (Hagner, 1944). Immediately east of the pit, the biotite schist contains large 2.5 inch (6 cm) long, light-blue kyanite porphyroblasts. The kyanite blades are cloudy, opaque, and range from a very light-blue to dark-blue. Minor amounts of fibrous white sillimanite, and uncommon brown grains of staurolite(?) were also identified in some samples.

Locally, the schist contains corundum (2 to 8 mm in size). The corundum forms trace amounts, to as much as 5 to 10% of the rock volume. The corundum is white, pink, and reddish pink, and for the most part appears to be industrial quality. On weathered surfaces, the corundum appears to contain abundant mineral inclusions and appears as cloudy, translucent to opaque, hexagonal prismatic mineral grains. However, when some grains are separated from the schist and broken, the fresh mineral surfaces appear to be surprisingly free of mineral inclusions, and are translucent to transparent with well-developed cleavage. Thus some of the corundum may potentially produce low-quality, pink and white sapphires. However, further research is needed to determine the gem potential (if any) of the corundum.

In addition to corundum, a gneiss was found about 100 yards east of the prospect pit which contained purplish-blue, transparent porphyroblasts up to 1.25 inches (3 cm) across. An XRD analysis of the porphyroblasts yielded a match for cordierite (see attachment). Locally, the cordierite forms 10% of the rock volume. These mineral grains are surprisingly clear and transparent, and are commonly fractured. Thus the size of cuttable material is somewhat reduced due to fracturing.

SAMPLE DESCRIPTIONS

Four sample groups were collected on the property. These include:

PC1-96. Collected from an outcrop under a pine tree immediately north of a jeep trail. The rock is a porphyroblastic mica schist with prismatic kyanite (1 to 2 inches long) with square cross sections. Samples contain some translucent to opaque, pink to pinkish-red corundum. Microscopically, the kyanite is heavily included. A few samples contain uncommon fibrous sillimanite.

PC2-96. Quartzofeldspathic gneiss collected adjacent to jeep trail about 100 yards east of PC1-96, contains a transparent purplish-blue mineral with conchoidal fracture. XRD analysis identified grains as cordierite.

PC3-96. Corundum schist with pink and white corundum collected about 25 yards west of PC1-96.

PC4-96. Small outcrop, 15 to 20 yards west of prospect pit. Samples contain 0.25 to 0.5 inch pink to pinkish-red corundum. Samples contain as much as 10 to 20% corundum.

RECOMMENDATIONS

This prospect is poorly explored and large portions are hidden under a thin layer of soil. Exploration for gemstones should include trenching as well as mapping the extent of mineralization. Trenching would probably reveal pockets of corundum schist and cordierite gneiss.

REFERENCES

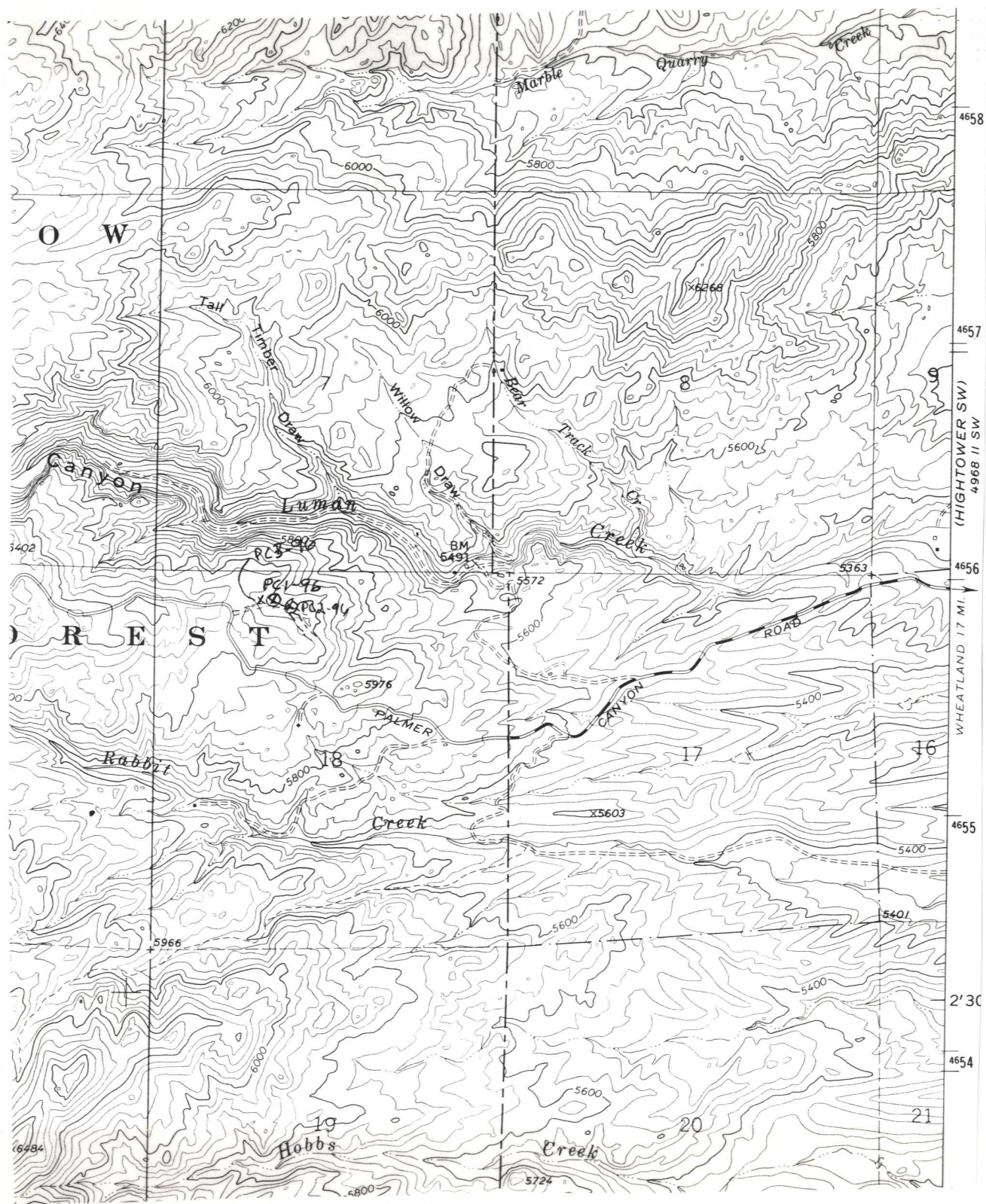
Hagner, A.F., 1944, Wyoming vermiculite deposits: Geological Survey of Wyoming Bulletin 34, 47 p.







Osterwald, F.W., Osterwald, D.B., Long, J.S., Jr., and Wilson, W.H., 1966, Mineral resources of Wyoming: Wyoming State Geological Survey Bulletin 50, 287 p.

Figure 1. Location map of the Palmer Canyon prospect (Base map - U.S. Geological Survey Laramie Peak 1:100,000 quadrangle).



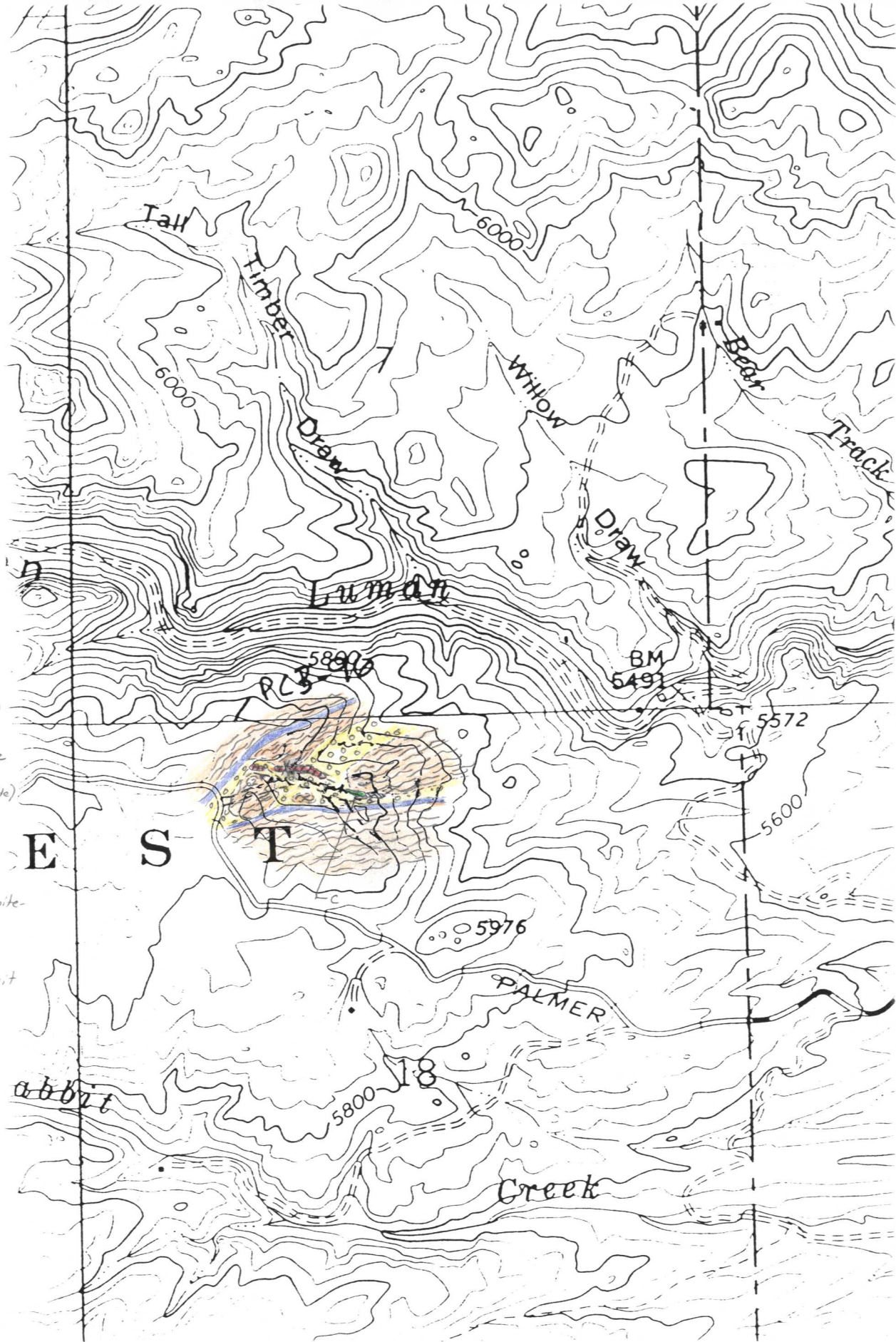
Figure 2. Sample location map of the Palmer Canyon prospect (Base map - U.S. Geological Survey Reese Mountain 1:24,000 quadrangle).



-  Alluvium
-  Mafic dikes (Proterozoic)
-  Corundum-mica-kyanite schist
-  Cordierite (iolite) kyanite-mica gneiss
-  Sillimanite gneiss
-  Archean granite-gneiss
- X Vermiculite prospect pit

PROSPECT MAP -
PALMER CANYON
METAPELITE

geology by
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2000





WYOMING STATE GEOLOGICAL SURVEY

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WSGS Lab. #: 960705

Client: Dan Hausel

Client Sample #: PC2-96, PC4-96, BMP4-96

Sample Description: PC2-96: gray-purple silicate
PC4-96: brown fractured silicate
BMP4-96: small light green crystals on pegmatite

Analysis Requested: XRD for identification

Method and Results: separate mineral of interest, crush with m/p, slurry mount, scan 5-70
degrees 2-theta:

PC2-96: very good match for cordierite
PC4-96: good match for staurolite
BMP4-96: good match for fluorapatite

Analyst: Robert W. Gregory Date: August 5, 1996
excess sample: returned