Montana Bureau of Mines and Geology
MBMG Open File Report 247

Reconnaissance Maps showing some areas of Chloritic Alteration of Precambrian Metamorphic Rocks, South Flank of the Highland Mountains, Madison and Silver Bow Counties, Montana

plotted on 7.5 minute topographic maps: Wickiup Creek (plate 1)
Table Mtn (plate 2)
Twin Bridges SW (plate 3)
Nez Perce Hollow (plate 4)

by

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RECONNAISSANCE MAP SHOWING SOME AREAS OF CHLORITIC ALTERATION OF PRECAMBRIAN METAMORPHIC ROCKS, SOUTH FLANK OF THE HIGHLAND MOUNTAINS, MADISON AND SILVER BOW COUNTIES, MONTANA

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These maps have been placed on open file to provide information on chlorite occurrences in Archean metamorphic rocks exposed on the south flank of the Highland Mountains. The area of investigation lies within four 7 1/2-minute quadrangles covering the Rochester district and extending northwest to Camp Creek (Figure 1). Detailed information on the field relationships, petrography, and chemistry of this alteration will be published by the Montana Bureau of Mines and Geology when this study is completed. The geology of this area has been described by Duncan (1976), O'Neill, Duncan and Zartman (1988) and mineralization in the Rochester district was described by Sahinen (1939). More recently lithogeochemical data from the Rochester district was provided by McClernan (1982) and controls on gold deposits were discussed by O'Neill and Schmidt (1989). Information on chlorite mined at the Antler mine on the south edge of the Silver Star district northeast of the Rochester district was presented by Berg (1983 and 1986).

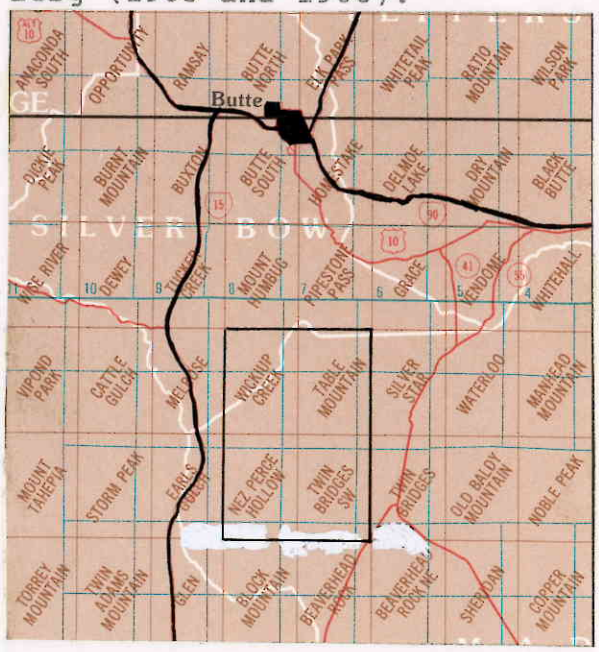

Figure 1. Location of Wickiup Creek, Table Mountain, Nez Perce Hollow and Twin Bridges 7 1/2-minute quadrangles.

Chloritic alteration exposed in outcrop is recognized by the green cast that this alteration imparts to the gneiss. Similarly, concentrations of chloritized gneiss float can be recognized in areas of sparse vegetation by a faint greenish coloration of the soil. The area of greatest concentration of chloritic alteration is associated with the South Rochester fault

in the vicinity of Camp Creek where there are numerous small areas of intense chloritic alteration (Figure 2). Most of the chlorite along Camp Creek is dark green. On the north side of Camp Creek quartz veinlets in quartzofeldspathic gneiss below the unconformity with the overlying Flathead Quartzite are surrounded by envelopes of chloritic alteration a few centimeters thick. Neither quartz veinlets nor chloritic alteration were recognized in the overlying Flathead Quartzite.

Other areas of chloritic alteration are along the Twin Bridges fault in secs. 22, 26, and 27, T. 2 S., R. 7 W. where a chlorite prospect has been trenched. Similar alteration occurs along a splay of the North Rochester fault in sec. 33, T. 2 S., R. 7 W. shown on the Twin Bridges SW 7 1/2-minute quadrangle. Partial chloritic alteration was recognized on several mine dumps along the South Rochester fault in the Rochester district and also is concentrated in the S 1/2 of section 5, T. 3 S. R. 7 W. along this same fault. Generally rock on mine and prospect dumps is veined by quartz with hematite and limonite along fractures. In many instances feldspars are sericitized. Some fragments show evidence of partial chloritic alteration where feldspars and mafic minerals have been largely replaced by chlorite.

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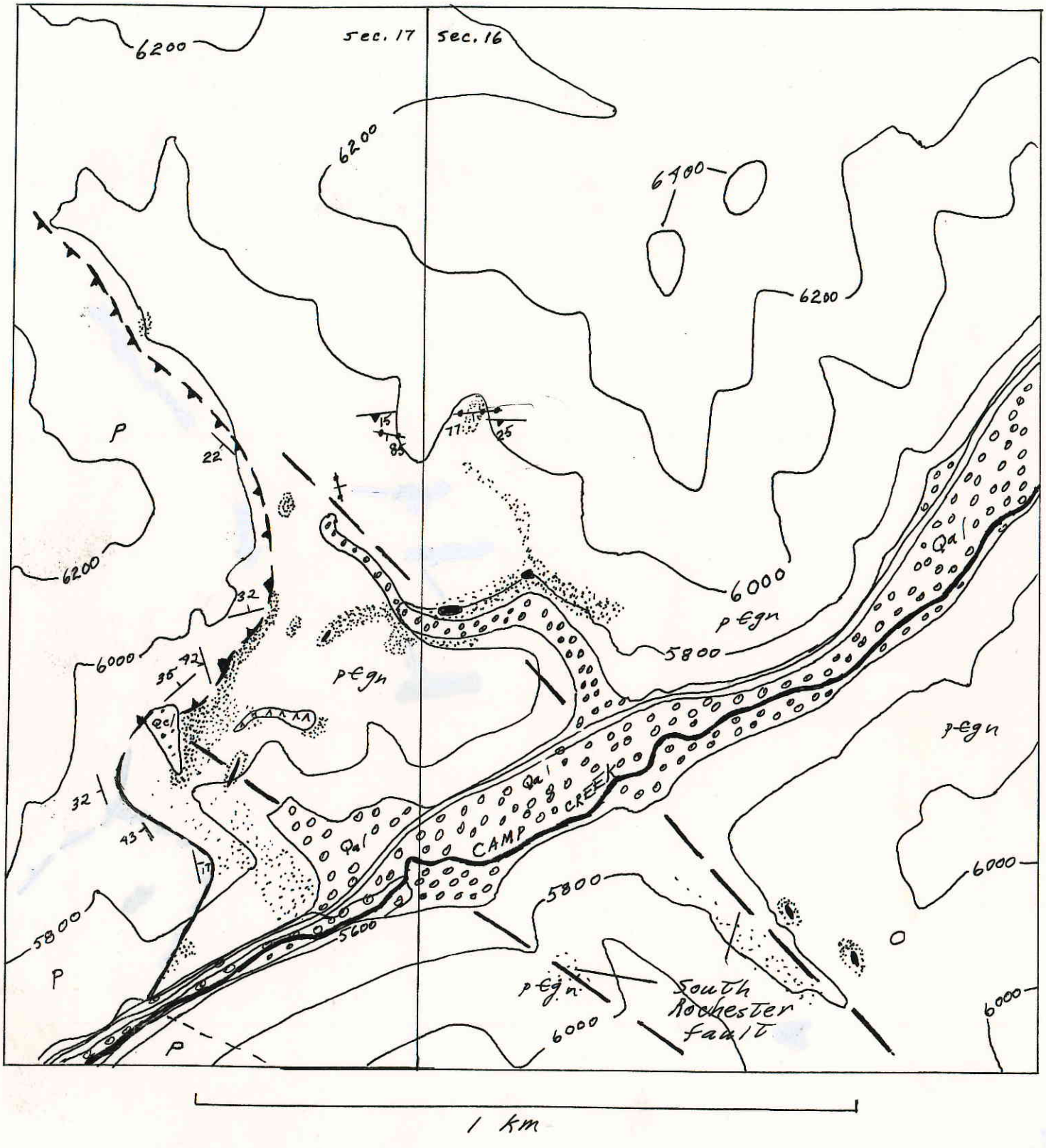
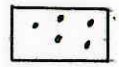
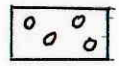
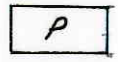


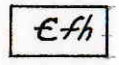
Figure 2. Area of chloritic alteration along Camp Creek in the W 1/2 sec. 16 and E 1/2 sec. 17, T. 2 S., R. 8 W. Base map enlarged from Wickiup Creek 7 1/2-minute quadrangle with contour interval of 200 ft. Location of splays of the South Rochester fault and Camp Creek fault from Duncan, 1976.

Explanation for Figure 2.

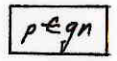

Colluvium (Quaternary)


Alluvium (Quaternary)

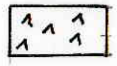

Paleozoic sedimentary rocks



Flathead Quartzite (Cambrian)



Quartzofeldspathic gneiss and hornblende gneiss with minor sillimanite schist (Precambrian)


Quartz pod


Lithologic contact


Low-angle fault - dashed where inferred


Aproximate trace of high-angle fault

Attitude of foliation

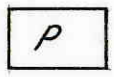
Attitude of bedding

Attitude of chlorite vein

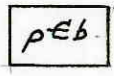

Intense chloritiization


Partial chloritization

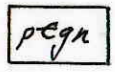
Explanation for Wickiup Creek, Table Mountain, Nez Perce Hollow and Twin Bridges 7 1/2-minute quadrangle maps. Faults from Duncan (1976) except for the Twin Bridges fault in secs. 8, 16, 21, 22 and 27, T. 2 S., R. 7 W. which was plotted from aerial photos. Contacts between rocks of the Belt Supergroup, Paleozoic formations and Precambrian gneiss in Wickiup Creek quadrangle from Duncan (1976).



Paleozoic sedimentary rocks



Belt Supergroup (Proterozoic)



Predominately quartzofeldspathic gneiss (Archean)

High-angle fault, dashed where approximately located and dotted where covered

Low-angle fault

Area of intensely chloritized gneiss. Indicates that in this area at least some completely chloritized gneiss was found, generally in float.

Small area in which some pieces of completely choritized gneiss were found either in float or on a mine or prospect dump.

Area in which partially chloritized gneiss in which mafic minerals and feldspars have been largely replaced by chlorite was found either in float or on a mine or prospect dump.

Altered gneiss found in float or on mine or prospect dump. Gneiss is veined by quartz, has limonite along fractures and in many instances feldspars have been sericitized.

Vein with attitude shown

Vertical vein

Strike of vein inferred from old workings

Note: Distribution of alteration types shown diagrammatically for dumps.