

GEOLOGIC MAP OF THE OPHEIM 30' x 60' QUADRANGLE
NORTHEAST MONTANA

by

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OPHEIM 30'x 60' QUADRANGLE

Introduction

The distribution of Quaternary sand and gravel deposits (Qsg) on this map was derived principally from interpretation of U.S. Geological Survey 7½' topographic quadrangles. Colton and others (1989) provided most of the information on the late Tertiary-early Quaternary deposits. The map by Colton and others (1989) also was used to derive some of the contacts between pre-Quaternary formations, but most of the latter came from the 1955 state geologic map (Ross and others). The contacts from the 1955 map were adjusted to the topography and extended laterally by use of structure contours derived from petroleum well logs. Supplemental geologic information came from ground-water well logs on file with the Montana Bureau of Mines and Geology's Ground-Water Information Center.

The Claggett Shale is overlain by sandstones of the Judith River Formation. The Bearpaw Shale is overlain by the Fox Hills Sandstone. In places both these Upper Cretaceous shales are overlain by Tertiary/Quaternary cemented gravel deposits. The sandstones and cemented gravels form a cap rock over the more easily eroded shale. Where glacial and postglacial streams have cut through the protective cap rock and incised deep valleys into the underlying shale, landslides and landslide deposits in the Claggett and Bearpaw shales are common. Some of the landslides extend for several miles (three to five kilometers) along the stream and may extend back from the stream more than one-half mile (about a kilometer).

Glacial till masks the bedrock over much of this quadrangle; bedrock, here, includes Tertiary and possible early Pleistocene sand and gravel, locally cemented. Most map unit contacts, even where shown as a solid line, should be considered as concealed or approximate.

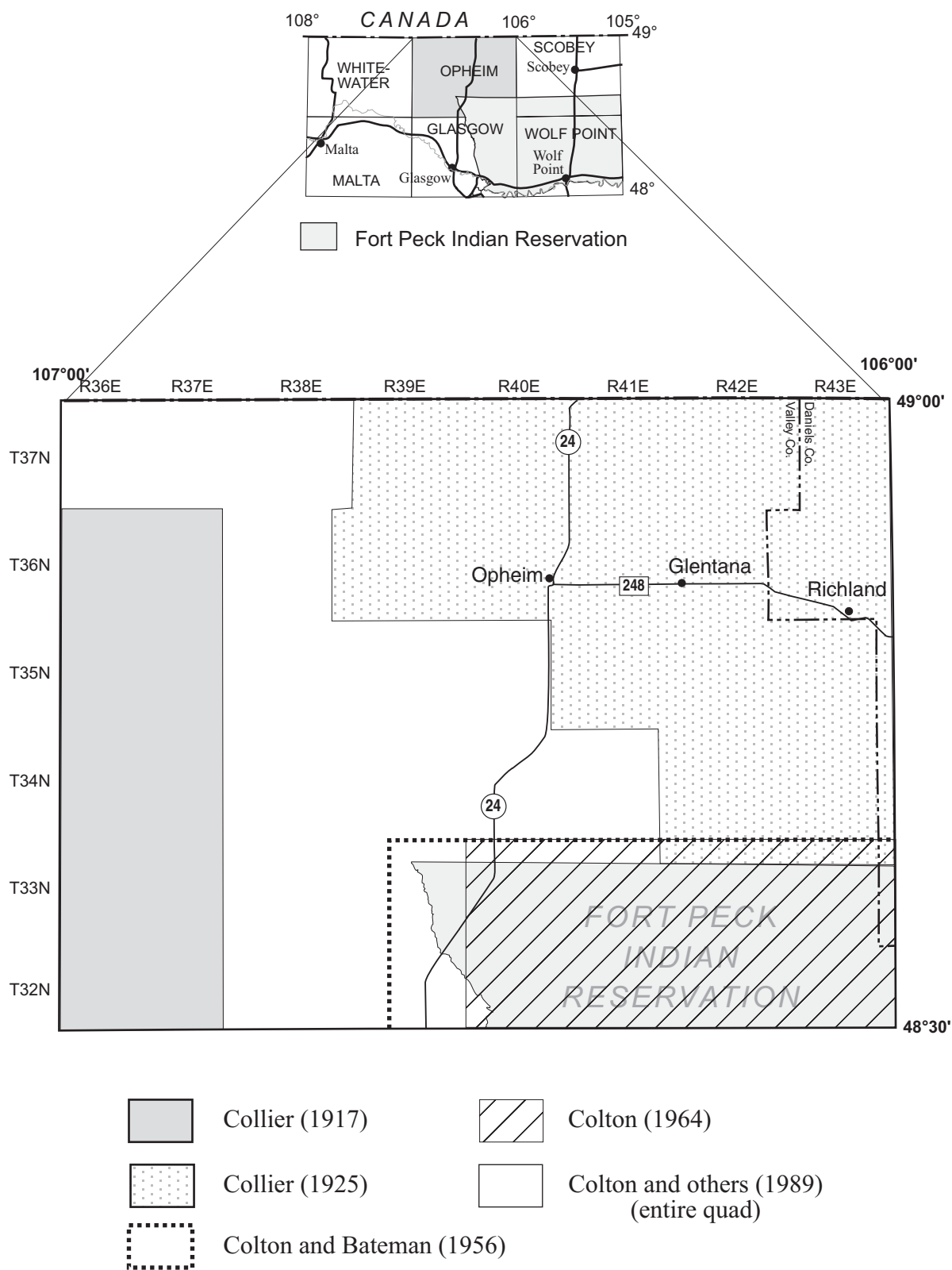


Figure 1. Location map for Opheim 30' x 60' quadrangle showing areas covered by older geologic maps within the quadrangle (see Sources of Previous Geologic Mapping), and location of adjacent geologic maps recently published by MBMG.

Correlation Chart of Map Units Opheim 30' x 60' Quadrangle

Quaternary

Qsg	Qls
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Tertiary

Unconformity

Tsg

Unconformity

Tfu

Upper Cretaceous

Khc
Kfh
Kb
Kjr
Kcl

Figure 2. Correlation chart of map units

Map Units

QUATERNARY

- Qsg Sand, gravel, silt or clay (Holocene and Pleistocene). On floodplains of modern channels and in or adjacent to former channels. This unit includes terrace deposits, glacial outwash, and colluvium.
- Qls Landslide deposits (Quaternary). Predominantly of Claggett Shale and Bearpaw Shale.

TERTIARY

- Tsg Sand and gravel (Miocene-Pliocene). This unit, predominantly sand and gravel, locally cemented with calcium carbonate, possibly is equivalent in part to the Flaxville Formation, but may include high-level sand and gravel deposits of possible early Pleistocene age that, owing to lack of fossil evidence, have not been dated. The unit is up to 30 meters (100 feet) thick.
- Tfu Fort Union Formation undifferentiated (Paleocene). This formation includes, from base to top, the Tullock, Lebo, and Tongue River Members. The maximum thickness of the Fort Union Formation is in the northeastern corner of the map (about 150 meters or 500 feet). The Tullock and Tongue River Members contain beds of coal which, in places, have been mined; much of the remainder of the formation is unconsolidated to semi-consolidated sand and shale.

UPPER CRETACEOUS

- Khc Hell Creek Formation. Principally composed of siltstone in its upper portion; sandstone content increases toward the base and, where adequately recharged, is a productive aquifer. Wells, however, should be continued into the underlying Fox Hills Sandstone to maximize yields. The Hell Creek Formation averages about 80 meters (250 feet) thick.
- Kfh Fox Hills Sandstone; maximum thickness 45 meters (150 feet).
- Kb Bearpaw Shale; 330 meters (1100 feet) thick.
- Kjr Judith River Formation. This formation ranges from 80 to 140 meters (250 to 450 feet) thick, the thinner section being near the east edge of the quadrangle. Sandstone dominates near the base of the formation, and well yields and water quality typically are better from it than the upper part which, typically, contains interbeds of shale and siltstone.
- Kcl Claggett Shale; 120 meters (400 feet) thick.

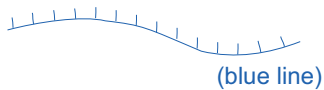
GEOLOGIC MAP SYMBOLS



Contact: dashed where approximate,
dotted where concealed



Significant break in slope
between two levels of Qsg



Limit of continental glaciation; hachures
on ice side.

References

Sources of Previous Geologic Maps within Quadrangle

- Collier, A.J., 1917, The Bowdoin dome: U.S. Geological Survey Bulletin 661, p. 193-209, plate 16, scale 1:375,000.
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- Colton, R.B., and Bateman, F.A., Jr., 1956, Geologic and structure contour map of the Fort Peck Indian Reservation and vicinity, Montana: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-225, scale 1:125,000..
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