U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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MONTANA BUREAU OF MINES AND GEOLOGY

OPEN-FILE REPORT 93-529

CORRELATION OF MAP UNITS

Qal	Qac	Qbf	Qe	Holocene / Pleistocene	QUATERNARY
		?	?		
Tpg				Pliocene	TERTIARY
Tmg				Miocene	
Trg					
Unconformity					
Tfu				Paleocene	

DESCRIPTION OF MAP UNITS

Qal **Alluvium (Holocene)**--Light-brown and gray, well-stratified and well-sorted clay, silt, sand, and gravel. As much as 4 m (13 ft) thick under the flood plain of Cedar Creek to less than 3 m (10 ft) under flood plains of other streams. Unit limited to areas characterized by meander or braided patterns on aerial photographs. Surface of unit may be subject to occasional flooding

Qac **Alluvium and colluvium (Holocene)**--Light-brown and gray, poorly sorted and well-stratified clay, silt, sand, and gravel deposited by slope wash and gravity processes. As much as 10 m (33 ft) thick, but generally less than 5 m (16 ft). The color and texture of the colluvium reflect the parent material upslope. May interfinger with alluvium; includes alluvial fans and much windblown clay, silt, and sand. Soil profiles range from well-developed to poorly developed

Qe **Eolium (Holocene and Pleistocene)**--Light- to moderate-brown windblown sand and silt deposits. As much as 5 m (16 ft) thick, but generally less than 2 m (6 ft). A thin mantle of eolium is present on most flat areas but has not been mapped

Qbf **Baked and fused bedrock (clinker) (Holocene and Pleistocene)**--Red to orange baked shale, sandstone, and siltstone of the Fort Union Formation that was heat-metamorphosed by combustion of lignite. Hard, dense, metamorphosed sediments are known as porcellanite; locally, sediments fused and melted to form black, vesicular, glassy, scoriaceous rock called buchite, which forms linings of chimneys and veins in porcellanite. Present in secs. 30 and 31, T. 15 N., R. 48 E. As much as 6 m (20 ft) thick, but generally less than 3 m (10 ft)

Tpg **Sand and gravel, undivided (Pliocene)**--Light-brown to light-gray, well-stratified and well-sorted sand and gravel. Thickness is as much as 10 m (33 ft), but generally less than 3 m (10 ft). Unit generally limited to altitudes less than 962 m (3,160 ft). May contain some Pleistocene sand and gravel

Tmg **Sand and gravel, undivided (Miocene)**--Light-brown to light-gray, well-stratified to poorly stratified and well-sorted to poorly sorted sand and gravel. Thickness is as much as 10 m (33 ft), but generally less than 4 m (13.1 ft). Unit is generally limited to altitudes above 962 m (3,160 ft) but below 1,024 m (3,360 ft). May include some Pliocene and Pleistocene sand and gravel

Trg **Rimroad Formation of Howard (1960) (Miocene)**--Light-brown to gray, well-sorted to poorly sorted, and well-stratified to poorly stratified sand, gravel, and volcanic ash 4 m (13 ft) thick. The Rimroad Gravel of Howard (1960) contains volcanic ash 7.1±1.4 million years old and much sand, silt, and clay in addition to gravel. Therefore, the name is revised to Rimroad Formation and the age is limited to Miocene. The age of the volcanic ash was determined by counting fission tracks in zircons from the ash by Nancy B. Naeser (Colton, Naeser, and Wilcox, 1983). Total thickness is 22 m (40 ft); average thickness is 6 m (20 ft). Base of the formation is at an altitude of approximately 1,024 m (3,360 ft) in the eastern part of the quadrangle but rises to 1,085 m (3,560 ft) in the western part

Tfu **Tongue River Member (Collier and Knechtel, 1939) of Fort Union Formation (Paleocene)**--Yellowish- and light-brown shale and sandstone containing numerous lignite beds. Estimated thickness of remaining strata is more than 215 m (700 ft)

w **Water**

Contact--Dashed where approximately located

Lineament--Mapped from aerial photographs

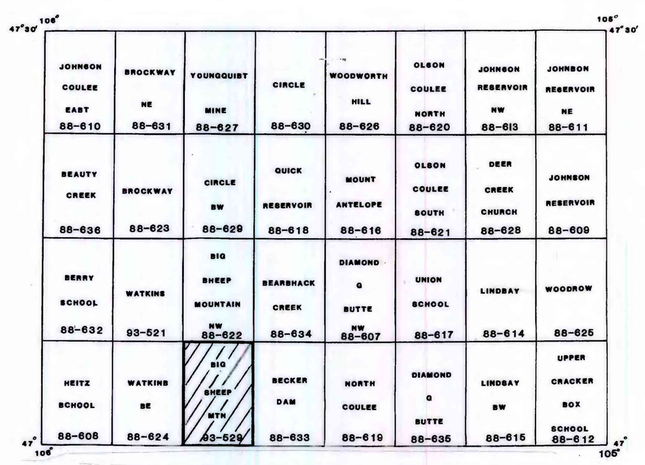
Gravel pit

REFERENCES

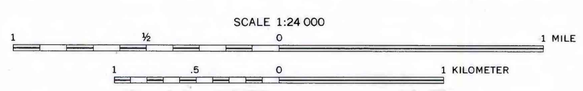
Collier, A.J., and Knechtel, M.N., 1939, The coal resources of McCone County, Montana: U.S. Geological Survey Bulletin 905, 80 p.

Colton, R.B., Naeser, N.D., and Wilcox, R.E., 1983, Seven million-year-old volcanic ash on Missouri-Yellowstone River drainage divide near Circle, Montana: Geological Society of America, Rocky Mountain and Cordilleran Sections, Abstracts, v. 15, no. 5, p. 419.

Howard, A.D., 1960, Cenozoic history of northeastern Montana and northwestern North Dakota with emphasis on the Pleistocene: U.S. Geological Survey Professional Paper 326, 107 p.



INDEX TO QUADRANGLES IN THE CIRCLE 30' x 60' QUADRANGLE. MAPPED QUADRANGLE SHOWN BY STRIPES; NUMBERS ARE OPEN-FILE NUMBERS



GEOLOGIC MAP OF THE BIG SHEEP MOUNTAIN QUADRANGLE, PRAIRIE COUNTY, MONTANA

By

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