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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MISSOURI RIVER BASIN
GEOLOGIC MAPPING AND MINERAL RESOURCE INVESTIGATIONS
NASHUA QUADRANGLE, MONTANA

PLATE I

Base taken from the U.S. Geological Survey Topographic Map of the Nashua Quadrangle
Culture revised as of 1949

Geology mapped in 1948 and 1949 by
Fred S. Jensen, assisted by Frederick T. Fischer

TRUE NORTH
MAGNETIC NORTH
19°E

APPROXIMATE MEAN
DECLINATION
1945

PRELIMINARY GEOLOGIC MAP
OF THE
NASHUA QUADRANGLE, MONTANA

SCALE 1:48,000

0 1 2 3 Miles

EXPLANATION

Qp — Intermittent pond deposits

Plastic clay and minor amounts of silt and sand; dark gray near surface, light brown at depth, thickness generally more than 6 feet.

Qac — Alluvial-colluvial deposits

Compact, poorly sorted silty clay, and minor amounts of sand and pebbles that decrease in quantity downslope; dark grayish brown; mapped deposits range in thickness from about 2 to more than 20 feet.

Qal / Qalt — Alluvium and terrace alluvium

Interbedded clay, silt, sand, and sandy gravel; the sandy gravel generally underlies the finer sediments at a depth of 50 feet or more in river valleys, one to 15 feet in tributary valleys; light to dark brown, gray and bluish gray; generally 110 to 140 feet thick in river valleys, 3 to more than 50 feet in tributary valleys. Hachures delimit alluvial fan. Terrace alluvium (Qalt) is similar in composition to other alluvium but surfaces are 5 to 15 feet higher.

Qot — Outwash terrace deposits

Brown sandy gravel enclosing a few cobbles and boulders and, especially near the top, abundant lenses of sand and silt; thickness ranges from 5 to 25 feet. Upper figure of numerical symbol is approximate altitude of terrace surface above sea level; lower figure is height of terrace surface above adjacent valley bottom: 2195' / 125'

Qic — Ice contact meltwater deposits

Brown sandy gravel, sand, and silt; the fine material well sorted and thinly bedded, the coarse material poorly sorted and ranging from non-bedded to well bedded; thickness ranges from a feather edge to about 10 feet.

Qs — Superglacial fluvio-lacustrine deposits

Silt, fine sand, and clay, proportions differing from place to place; beds thin to massive and contorted by periglacial slumping, or non-bedded; light tan to dark brown, thickness ranges from a feather edge to more than 70 feet. Dot pattern in central part of quadrangle indicates superjacent silty and clayey fine sand of unknown origin; dark brown; indistinctly bedded, bedding uncontorted; thickness as much as 12 feet; boundaries very indefinite. Dot pattern in western part of quadrangle indicates dune sand, well sorted, medium grained, dark brown, thickness as much as 8 feet, of Recent origin.

Qgm — Ground moraine

Predominantly till, enclosing thin widely scattered lenses of silt, sand, and gravel. Till is a compact unstratified mixture of clay and lesser amounts of silt, sand, pebbles, cobbles, and boulders; generally light brown. Thickness is generally 7 to 30 feet, in buried valleys as much as 170 feet. Dot pattern indicates superjacent silty and clayey fine sand of unknown origin; dark brown; indistinctly bedded; thickness 4 to 9 feet; boundaries very indefinite.

Qw & Qw$_g$ — Wiota gravels

Reddish brown sandy quartzite gravel enclosing minor sand lenses, in places fine to medium-grained sand forms upper part, and locally all of formation is sand, silt, and clay, glacial erratic stones rare to absent; well sorted to very poorly sorted; thickness generally 6 to 20 feet. The symbol Qw$_g$ designates poorly sorted clay, silt, sand, and fine gravel of southern and southwestern provenance containing only material derived from local Cretaceous (and early Tertiary ?) bedrock.

Khc — Hell Creek formation

Grayish rusty brown medium sand, discontinuously cemented to form ledges and loglike to ovoid concretionary masses of sandstone; commonly cross-bedded, some massive bedding; lenses of conglomerate in lower part contain quartzite pebbles, dinosaur remains and fossil wood fragments common, thickness about 300 feet, of which the lower 50 to 60 feet are preserved within the quadrangle. Lies unconformably on the Fox Hills sandstone.

Kfh — Fox Hills sandstone

Rusty brown fine sand, discontinuously cemented to form ledges and ovoid concretionary masses of sandstone; bedding thin to massive, some cross-bedding; contains lenses of gray to brown thin-bedded silt and clay; grades into Bearpaw shale through about 35 feet of silt and silty clay that weather light gray; thickness about 120 feet.

Kb — Bearpaw shale

Dark gray clayey shale, containing ovoid concretions of several kinds, many thin beds of bentonite, a few beds of brownish gray sandy shale near top, and marine fossils; thickness about 1,100 feet.

m — Man-made deposits
principally reworked Bearpaw shale and alluvium

Areas affected by present-day landsliding or mantled by slump debris

Fault
perhaps caused by landsliding

Scarp

Segment of meltwater channel

B' Qgm / 12' Qw / Kb — Abbreviated log
Shows stratigraphic sequence and thickness, in feet, of geologic formations. (Symbol ± means approximately, symbol > means greater than.)

M-F(C) — Abbreviated materials description
Sequence of letters denotes order of abundance of constituent materials. Letters in brackets indicate minor quantity, or absence.

F- fine sand, silt, clay (particle diameter less than 0.25 mm.).

M- medium to coarse sand, fine to coarse gravel (particle diameter 0.25 mm. to 3 inches).

C- cobbles, boulders (larger than 3 inches)

▲ Site of abbreviated log or of abbreviated materials description

Contact — *dashed where approximately located*

Contact — *gradational or indefinite*

STEVENS △ Triangulation station

Contact — *covered by slump debris*

X BM 2048.76 — Bench mark

1920 — Approximate altitude

Sand and gravel pit

Artifical excavation

Powerline

Cemetery

Spring

Intermittent swamp

Intermittent stream and pond

Irrigation canal

School

Occupied houses or farmsteads

Other buildings — *single or in small groups*

Church

Unpaved airstrip

Areas having many buildings

Paved highway

Gravelled highway

Graded road

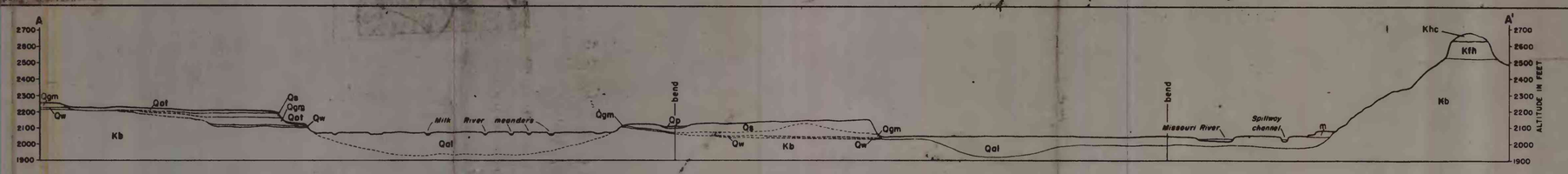
Primitive road

Quaternary
- Recent
- Pleistocene
  - Wisconsin Stage
    - Cary (?) Substage
  - Pleistocene (?)
- Upper Cretaceous
  - Montana group

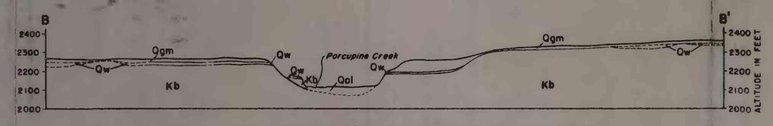
QUATERNARY

QUATERNARY (?)

CRETACEOUS

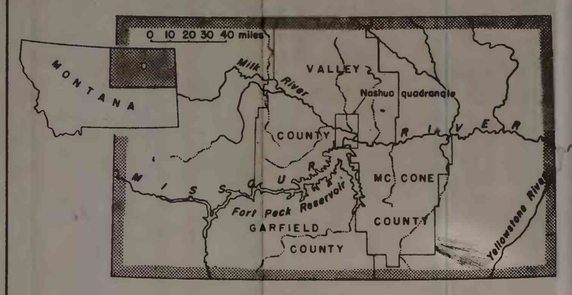


SECTION ALONG LINE A-A'; VERTICAL SCALE EXAGGERATED



SECTION ALONG LINE B-B'; VERTICAL SCALE EXAGGERATED

U. S. Geological Survey
OPEN FILE REPORT
This map is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature.



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