

Surface Geology

Harmon Quadrangle, North Dakota

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UNIT DESCRIPTION

QUATERNARY SYSTEM

HOLOCENE

OAHE FORMATION

Qa1 Alluvial Stream Sands
Moderately sorted lenses and layers of sand, silt, clay, and occasionally thin layers and lenses of fine gravel; typically grayish brown to dark brown, moderately bedded; thickness is generally a few feet but typically less than 15 feet (5 meters).

Qas Alluvial Stream Gravels
Moderately sorted layers and lenses of sand, gravel, and occasionally thin layers and lenses of sand and clay; typically brown to dark brown, moderately bedded; thickness generally 5-20 feet (1.5-6.5 meters).

Qaf Alluvial Fans
Moderately to moderately-well sorted sand, gravel, and occasionally thin layers and lenses of silts and cobbles; typically light brown to dark brown, moderately to well bedded; thicknesses generally 5-20 feet (1.5-6.5 meters).

Qal Alluvial Flood Plains
Moderately to moderately-well sorted sand, silt, clay and occasionally gravel layers of thin layers and lenses; typically grayish brown to dark brown, moderately to obscurely bedded; thicknesses are up to 50 feet (15 meters) in the Missouri River Valley.

Qp Lacustrine (Pond)
Interbedded layers of silts and clays with occasional very thin layers of fine sand; alternating layers of dark and light grayish to grayish-brown; thicknesses typically less than 6 feet (2 meters).

HOLOCENE/PLEISTOCENE

Qc Colluvium
Loose, incoherent sediment that typically forms on slopes to form aprons around buttes and large hills; as thick as 15 feet (5 meters); formed by creep, flow, and slumping.

PLEISTOCENE

COLEHARBOR GROUP

Qat Terrace Deposits
Gravels and medium to coarse-grained sand with occasional fine sand layers and lenses. The gravels consist primarily of pebble to cobble sized igneous rocks and locally derived rock fragments which are commonly iron stained and occasionally iron cemented. Generally are moderately sorted but contains well-sorted layers and lenses; the thicknesses of these sand and gravel units are typically 10-25 feet (3-8 meters).

Qtc Terrace Deposits/Colluvium
Thinner gravels with medium to coarse-grained sand with occasional fine sand layers and lenses overlying loose, incoherent sediment that has formed colluvium on slopes. Generally is moderately sorted but contains well-sorted layers and lenses; the thicknesses of these sand and gravel units are typically 3-10 feet (1-3 meters).

Qgf Glaciofluvial Sands
Medium to fine-grained sands with occasional layers and lenses of coarse and fine gravels and rarely medium gravels and silts; these glaciofluvial sediments form in large stream channels; the thicknesses are typically less than 15 feet (5 meters).

Qgv Glaciofluvial Gravels
Medium-grained sand to fine-grained gravels with occasional layers and lenses of fine-grained gravels and rarely thin layers and lenses of silts; these glaciofluvial sediments form in large stream channels; the thicknesses are typically less than 25 feet (8 meters).

Qgt Till
Poorly sorted mixture of pebbly, gray to brown sand, silt, and clay. Till once mantled the entire area, but erosion has generally confined it to the uplands in this area. The uplands are generally well vegetated and till exposures are limited; thicknesses are typically less than 15 feet (5 meters).

Qgs Till/Glaciofluvial
Poorly sorted mixture of pebbly, sandy, and silty clay overlying and mixed with moderately to well-sorted sands and gravels; gray to brown sands and gravels at typically less than 10 feet (3 meters) with the tills, which are typically less than 15 feet (5 meters).

TERTIARY SYSTEM

Tb BULLION CREEK FORMATION
Yellow to yellowish-brown silt, sand, clay, carbonaceous shale, sandstone, and lignite; non-marine river, lake, and swamp, floodplain, and lacustrine sediment; as thick as 120 feet (37 meters).

Ts SLOPE FORMATION
Grayish-brown to yellowish-brown sand, silt, clay, sandstone, and lignite; non-marine river, lake, and swamp sediments; as thick as 40 feet (12 meters).

Tc CANNONBALL FORMATION
Interbedded gray, brownish gray, and olive brown claystone, sand, and sandstone; marine shoreline and offshore marine sediments; as thick as 400 feet (122 meters).

Geologic Symbols

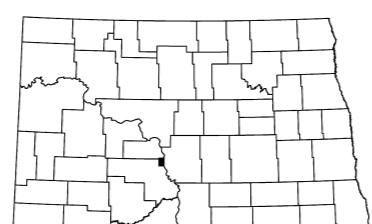
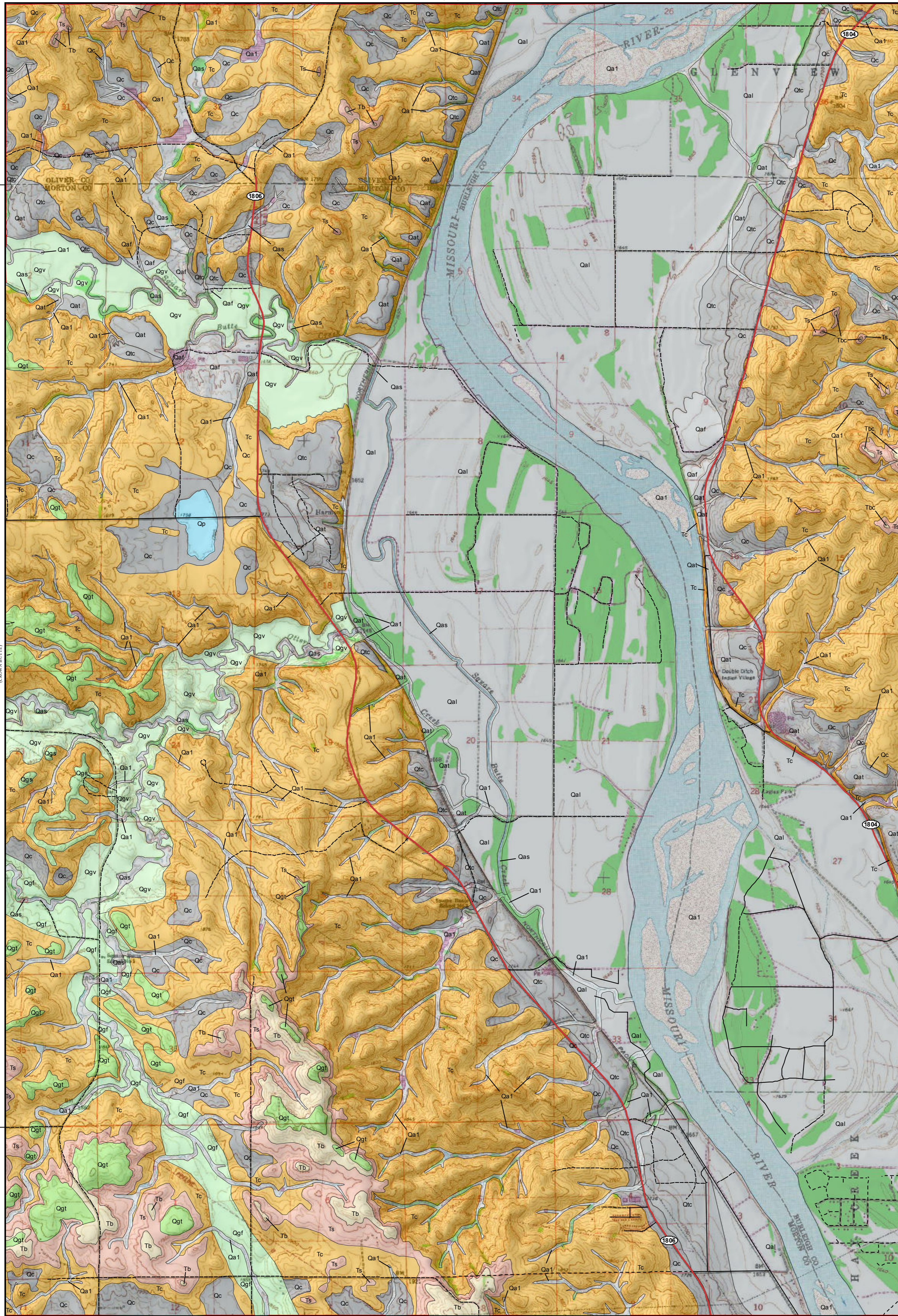
— Known contact between two geologic units

Other Features

— State Highway

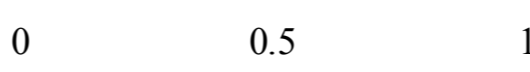
— Paved Road

--- Unpaved Road



Harmon Quadrangle, North Dakota

Scale 1:24,000



Miles

Lambert Conformal Conic Projection Standard Parallels 46° 52' 30" and 47° 00' 00"
1927 North American Datum NGVD 1929
USGS 7.5 Minute Topographic Map Contour Interval 10 Feet
Road Layer Rectified to 2003 NAIP Digital Orthophoto

11° MN

1976 Magnetic North
Declination at Center of Sheet

Note: Harmon 24k quadrangle was not edgematched to adjacent mapped 24k quadrangles: Mandan and Burnt Butte.

This geologic map was funded in part by the EDMAP component of the USGS National Cooperative Geologic Mapping Program.