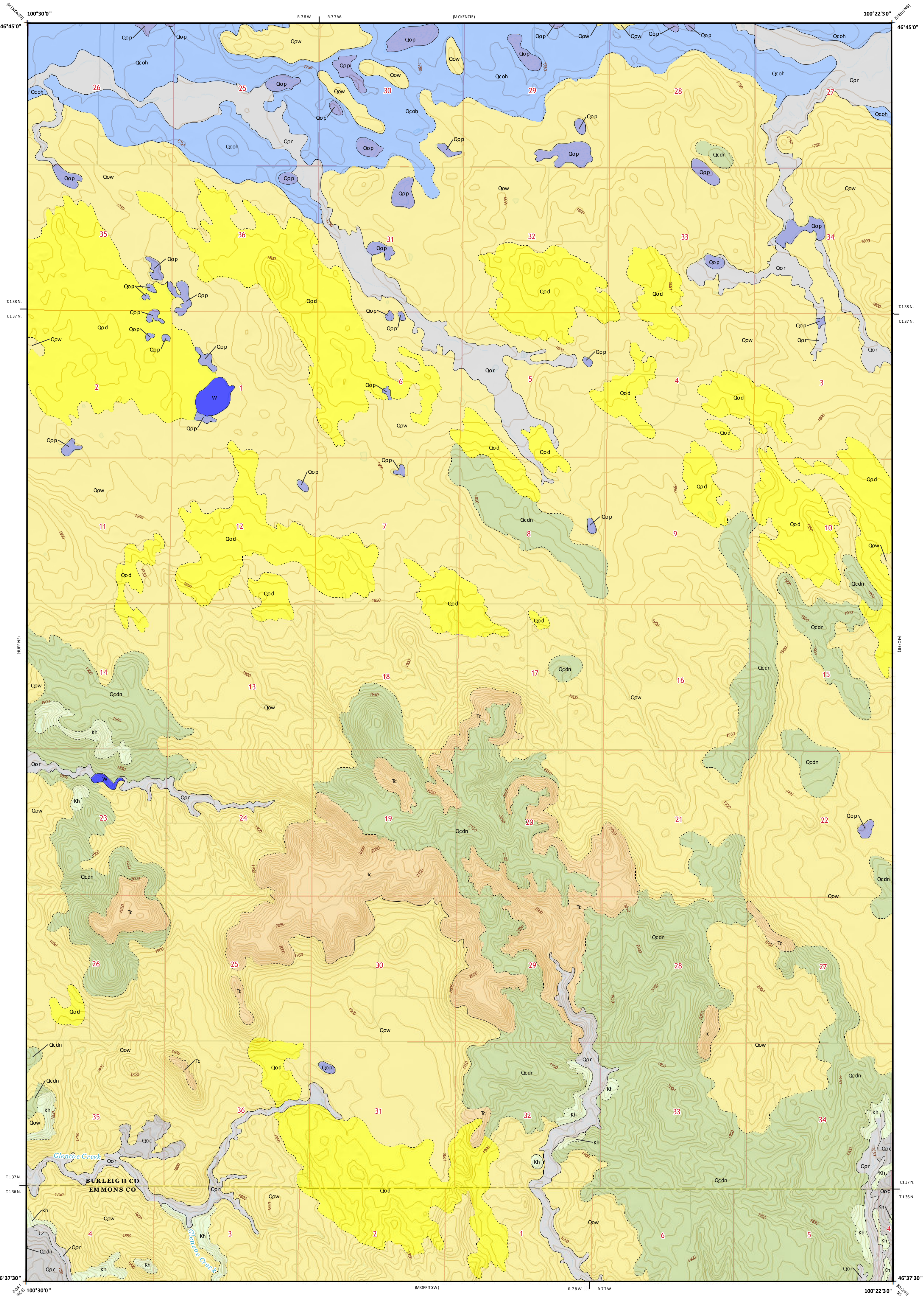


Surface Geology

Moffit NW Quadrangle, North Dakota

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2020



QUATERNARY SYSTEM

HOLOCENE

OAHE FORMATION

Sand, silt, clay, gravel, and organic debris; all postglacial sediment deposited on the landscape; includes river sediment, windblown sediment, and lake sediment.

Qod Windblown sand

Well-sorted, fine to medium sand; obscurely bedded; poorly developed paleosols common; subdued topography, consisting of vague knobs and elongated ridges with long axes aligned parallel to prevailing northwesterly winds; blowouts common; windblown lake and fluvial sand reworked into dunes; currently inactive.

Qow Windblown silt and sand

Moderately to well sorted grayish brown to tan, silt and sand; deposited as a thin mantle draped over, and only slightly modifying, the pre-existing glacial and non-glacial topography; generally less than 10 feet (3 meters) thick.

Qop Pond and slough sediment

Organic debris, clay, and silt; obscurely bedded; dark colored; generally more than 3 feet (1 meter) thick; deposited in poorly drained depressions in the landscape.

Qor Alluvium and overbank sediment

Sand, silt, clay, and disseminated organic debris; obscurely bedded, dark colored; locally abundant gastropod and pelecypod shells including *Valvata tricarinata*, *Sphaerium* sp., and *Pisidium* sp.; commonly up to 50 feet (15 meters) thick in the Missouri River floodplain and up to 15 feet (4.6 meters) thick along creeks in the area.

HOLOCENE/PLEISTOCENE

Qoc Colluvium

Unconsolidated sediment, mostly fine sand, silt and clay; obscurely bedded, dark colored; deposited primarily by slope wash and mass movement as an apron at the base of bedrock uplands. Commonly up to 15 feet (4.6 meters) thick.

PLEISTOCENE

COLEHARBOR GROUP

The Coleharbor Group includes all sediments in North Dakota associated with deposition by Pleistocene glaciers.

Qcdn Draped glacial sediment

Light olive-brown to olive-brown; unsorted; unbedded; calcareous; shaly; lignite fragments common; contains abundant cobbles and surface boulders of mostly crystalline lithologies, with minor amounts of limestone, dolostone, and, more rarely, local bedrock types; undulating to hilly surface; discontinuous; thin; lacks hummocky topography owing to postglacial erosion; deposited on a non-glacial surface as a thin mantle draped over, and only slightly modifying, the pre-existing topography by a pre-Late Wisconsinan glacier (Napoleon Advance). May be covered by a patchy, thin (< 5 feet [1.5 meters]) veneer of windblown sediment.

Qcoh Collapsed lake sediment

Flat-bedded to gently folded, light olive-brown to olive-brown laminated clay, clayey silt, silty clay, silt and sand; non to moderately calcareous; iron-stained in places; small (generally less than pebble-sized) carbonate nodules and masses of gypsum, and sand-sized organic fragments common; subtle, flat to gently undulating hummocky surface, pitted by steep-sided, bowl-shaped depressions (kettle holes) formed by the melting of detached blocks of buried ice; sediment deposited in a proglacial lake floored by stagnant ice from an earlier glacial advance. May be covered by a patchy, thin (< 5 feet [1.5 meters]) veneer of windblown sediment.

PALEOGENE SYSTEM

PALEOCENE

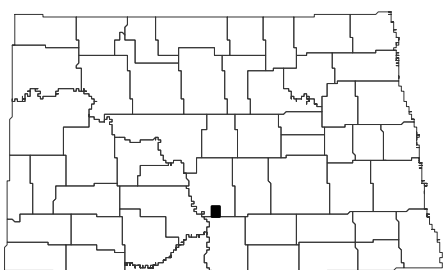
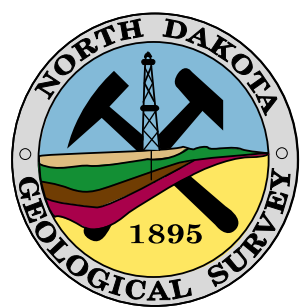
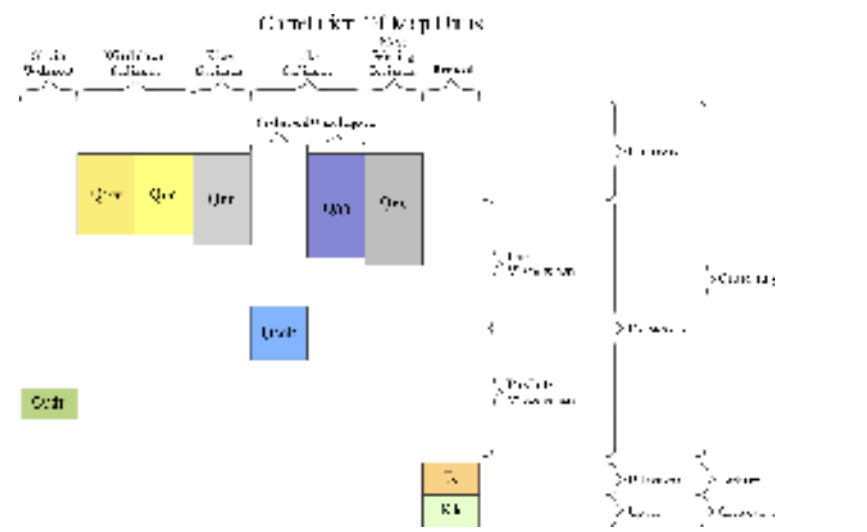
Tc CANNONBALL FORMATION

Marine sandstone and mudstone. Grayish green to yellowish brown, medium to fine grained, generally poorly cemented sandstone; contains scattered ironstone concretions and dark mineral grains that impart a "salt and pepper" appearance; commonly capped by a two- to three-foot-thick, well-cemented, lenticular sandstone. Light to dark gray to black mudstone; fissile; commonly banded with lenses of white to yellowish brown silt and very fine sand; forms smooth, rounded slopes. Marine fossils, ophiomorpha, and petrified wood fragments common locally. The maximum thickness of the Cannonball Formation is about 150 feet (46 meters) in this map area. May be covered by a thin (< 5 feet [1.5 meters]) veneer of windblown or glacial sediment.

CRETACEOUS SYSTEM

Kh HELL CREEK FORMATION

Nonmarine, drab colored, gray to grayish brown interbedded sandstone, siltstone, mudstone, and swelling claystone; poorly to moderately well-cemented crossbedded sandstone; bentonitic claystone; abundant limestone, manganese oxide and iron oxide nodules and concretions; forms sparsely vegetated, rilled slopes that are highly prone to failure. Maximum thickness in the map area is about 250 feet (76 meters).



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