

Surface Geology

Lankin Quadrangle, North Dakota

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EXPLANATION

QUATERNARY

HOLOCENE

OAHE FORMATION

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

Hor Alluvium And Overbank Sediment

Sand, silt, clay and disseminated organic debris; obscurely bedded; dark colored; in many places associated with sand and gravel of older river-channel sediment; commonly more than three feet (1 meter) thick.

Hop Pond and slough sediment

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

SHERACK FORMATION

Clay, silty clay, silt, and sand, thinly laminated; clayey in the central part of the lake plain and silty toward the margins; light gray where unoxidized and yellowish gray to olive-brown where oxidized; wood fragments common at the base; offshore, nearshore, shoreline and deltaic sediment deposited south of ice that occupied the Red River lowland during the Emerson Phase of Glacial Lake Agassiz.

Hsa Deltaic sediment - silt and clay

Well-sorted, light to dark grayish brown, flat bedded shaly silt and silty clay derived from tills exposed on the uplands above the Pembina escarpment and deposited on fans proximal to the mouths of rivers flowing onto the Elk River delta; very shaly; flat to gently sloping surface; up to 18 feet (6 meters) thick.

POPLAR RIVER FORMATION

Fluvial, channel and overbank sediment deposited in the Lake Agassiz basin during a desiccation period (the Moorhead phase); the West Fargo Member consists of fluvial channel sediment; the Harwood Member consists of fluvial overbank sediment; only the location of the West Fargo Member is mapped on the surface of the Sherack Formation as compaction ridges.

West Fargo Member

Sand; fine- to coarse-grained; and associated silt and clay; cross-bedded; significant thicknesses of gravel are present in some areas; deposited on early Lake Agassiz offshore sediment during the Moorhead Phase and buried by younger offshore sediment when Lake Agassiz re-flooded during the Emerson Phase; differential compaction between the lake clay and river sediment is expressed at the surface as compaction ridges, depicted on the map by a blue line-symbol.

HOLOCENE AND OLDER

Qs Sediment eroded by slope processes

Sand, silt and clay; unsorted; unbedded; often pebbly; steeply sloping and eroded by mass movement and slope wash; lithology reflects the upslope material; colluvium commonly present at the base of steep slopes.

PLEISTOCENE

COLEHARBOR GROUP

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

GOOSE RIVER FORMATION (UNDIFFERENTIATED)

Sediment deposited by a glacier as a result of a readvance from the north west (Riding Mountain provenance) of the generally retreating Late Wisconsinan ice sheet into the Red River lowland.

Qgm Clay-Loam, pebbly

Unsorted; unbedded; contains cobbles and boulders; shale pebbles abundant; as much as 80 feet (24 meters) thick; deposited by glacial ice on an ice-scored glacial landscape; collapsed glacial sediment with less than 30 feet (10 meters) of relief.

Qgrw Clay-loam, pebbly

Unsorted; unbedded; as much as 80 feet (24 meters) thick; flat to gently undulating surface, very bouldery in places; a thin veneer of shoreline, nearshore, or offshore sediment is commonly present; glacial sediment eroded (washed) by lake waves.

Qgre Sand and gravel

Moderately well-sorted sand and gravel; crossbedded to flatbedded; faults and soft-sediment deformation structures common; contains inclusions of well sorted silt; cobbles, boulders, and inclusions of till common; level to undulating ridges (eskers) and mounds (kames) with local relief up to 80 feet (24 meters); channel sediment deposited by streams flowing on, in, or under glacial ice.

Qgrf Sand and gravel, shaly

Moderately well-sorted, light to dark grayish brown, low-angle flat-bedded to high-angle cross-bedded silt, sand, and gravel deposited as outwash by the ancestral Park River and other meltwater streams flowing off the Pembina Escarpment onto the Elk Valley delta; flat to gently undulating surface commonly with braided channel scars, oxbows, and other relief markings; up to 70 feet (21 meters) thick.

OLDER LAKE SEDIMENT

Lake sediment deposited in the glacial Lake Agassiz basin south of glacial ice that occupied the Red River lowland during a pre-Emerson Phase high-water event.

CRETACEOUS SYSTEM

Kp PIERRE AND NIOBRARA FORMATIONS, UNDIFFERENTIATED (UPPER CRETACEOUS)

Shale; commonly obscured by a thin veneer of till; offshore marine deposits.

Geologic Symbols

- Known contact between two geologic units
- Approximate contact between two geologic units

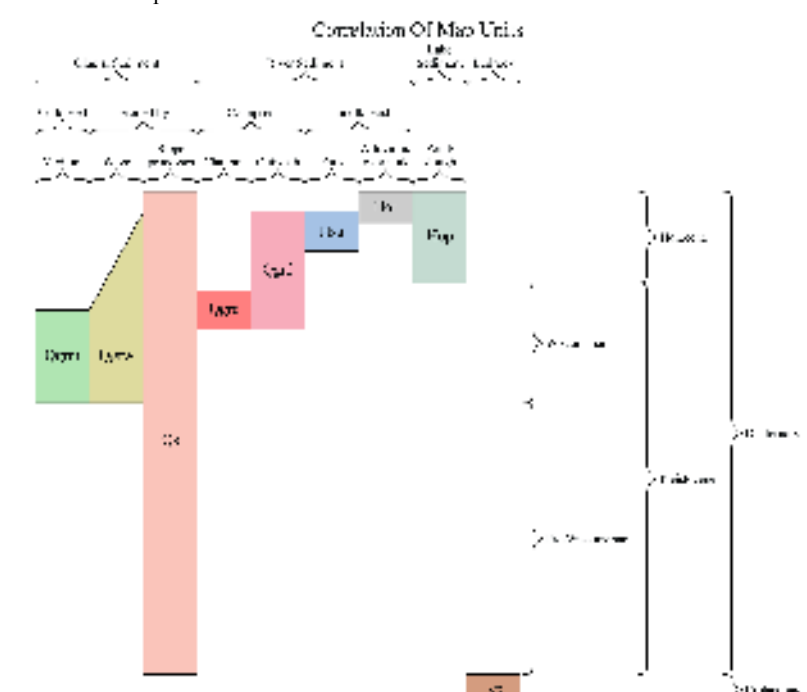
Other Lineations

Established from aerial photographs; line marks the dimension of the feature; located in glacial sediment and thinly veneered glacial sediment; interpreted as disintegration trenches, streamlined bedforms associated with the movement of glacial ice, or lineations of unknown origin; generally difficult to discern on topographic maps and on the ground.

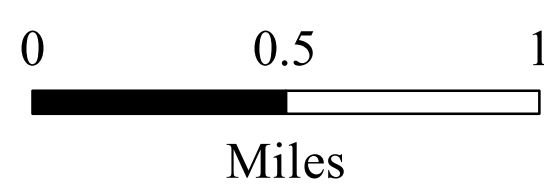
Beach ridges, spits and offshore bars
Established from aerial photographs; line indicates the crest of the ridge; interpreted as beach ridges or offshore bars deposited along the margin of Lake Agassiz; discernible on topographic maps and on the ground.

Other Features

- Paved Road
- Unpaved Road



Scale 1:24,000



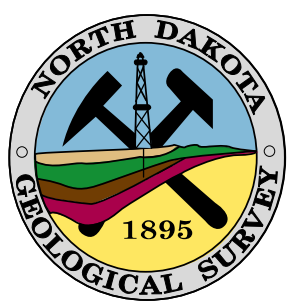
Miles

Lambert Conformal Conic Projection Standard Parallels 48° 15' 00" and 48° 22' 30"
1927 North American Datum NGVD 1929
USGS 7.5 Minute Topographic Map Contour Interval 10 Feet

9° 30'

MN

1972 Magnetic North
Declination at Center of Sheet



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