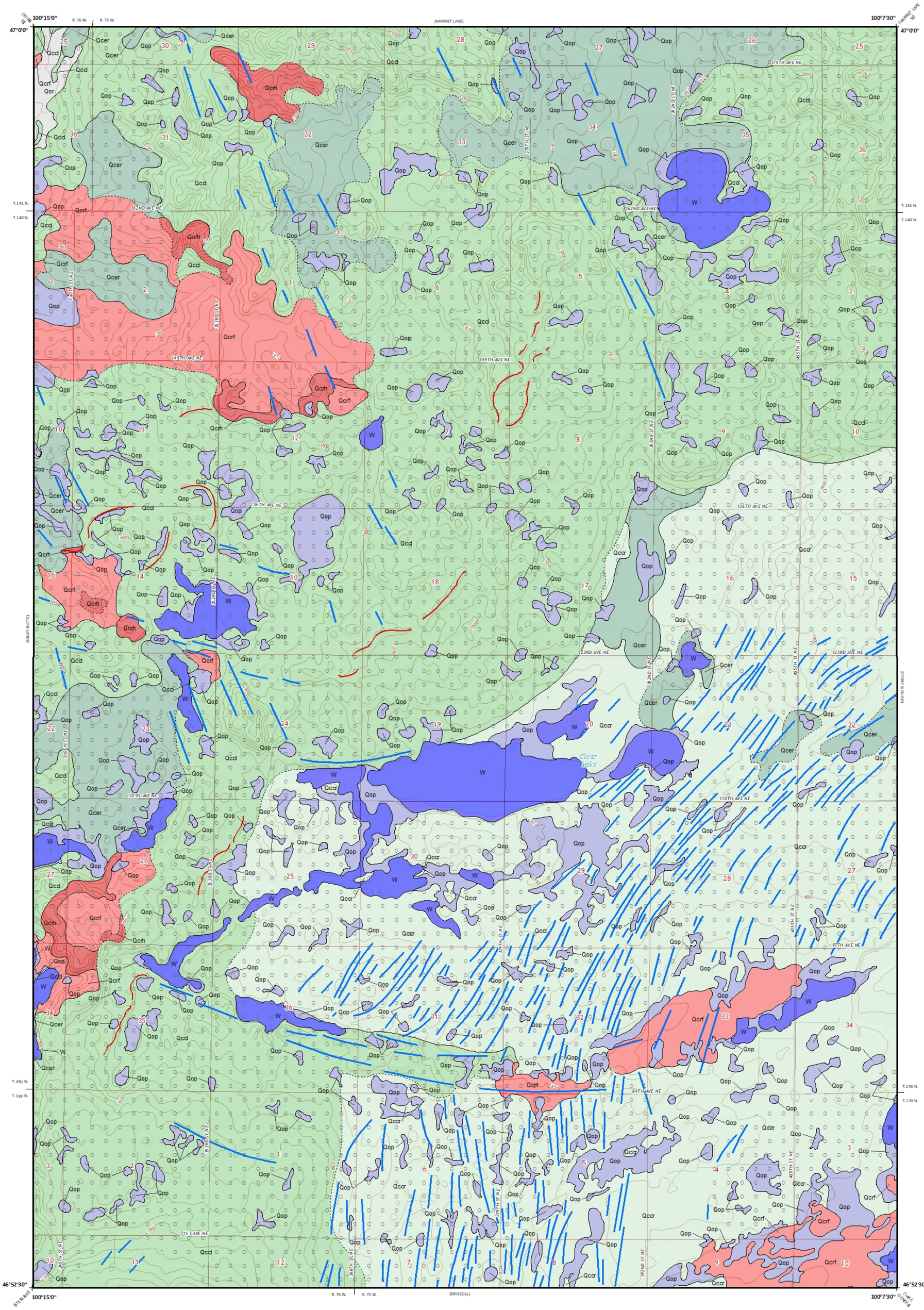
North Dakota Geological Survey
24K: ClrL - sg

Edward C. Murphy, State Geologist
Lynn D. Helms, Director Dept. of Mineral Resources

Surface Geology
Clear Lake Quadrangle, North Dakota

Lorraine A. Manz

2021



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.

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 more than 3 feet (1 meter) thick.

PLEISTOCENE

COLEHARBOR GROUP

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

Qcer — **River-eroded glacial sediment**
Light olive-brown to olive-brown; unsorted; unbedded; contains cobbles and boulders; shale pebbles abundant; overlain by a thin, discontinuous layer of fluvial silt and sand or sand and gravel. Flat to gently undulating surfaces with residual ring-shaped hummocks and other collapse features visible in places on aerial photographs and LiDAR. In the bottoms of former till-floored meltwater channels and broad areas of stream-washed till. Glacial sediment eroded by running water.

Qcrf — **Collapsed outwash**
Moderately well-sorted, light to dark olive-brown, low-angle flat-bedded to high-angle cross-bedded silt, sand, and gravel; calcareous; shaly; bouldery in places; deposited as outwash or by meltwater in contact with the ice margin.

Qcrh — **Collapsed outwash**
Moderately well-sorted, light to dark olive-brown, faulted and contorted plane- and cross-bedded, pebbly silt, sand, and gravel; calcareous; shaly; cobbles and boulders common; rolling to hilly surface; collapsed sediment deposited by supraglacial rivers.

Qccl — **Collapsed glacial sediment**
Light olive-brown to olive-brown; unsorted; unbedded; calcareous; very shaly; lignite fragments common; contains abundant cobbles and boulders of mostly crystalline lithologies, with minor amounts of limestone, dolostone, and, more rarely, local bedrock types including silcrete and sandstone; root casts up to 1 inch (2.5 cm) in diameter common locally; undulating to hilly, hummocky surface; deposited as end moraine on a predominantly non-glacial surface by an early Late Wisconsinan glacier (Long Lake Advance).

Qccr — **Collapsed glacial sediment**
Light olive-brown to olive-brown; unsorted; unbedded; calcareous; very shaly; lignite fragments common; contains abundant cobbles and boulders of mostly crystalline lithologies, with minor amounts of limestone, dolostone, and, more rarely, local bedrock types including silcrete and sandstone; gently undulating to rolling, hummocky surface; numerous ephemeral ponds and small lakes; collapsed low-relief glacial sediment deposited as ground moraine by an early Late Wisconsinan glacier.

Geologic Symbols

——— Geologic contact

– – – – Geologic contact (inferred)

○ ○ ○ ○ ○ ○ **Hummocky topography –** Established from aerial photographs and LiDAR; the circular pattern indicates areas of subdued ring-shaped hummocks in collapsed supraglacial sediment; interpreted as circular disintegration ridges formed by the subsidence of supraglacial sediment (commonly till) during wastage of the underlying ice; generally difficult to discern on topographic maps and on the ground.

Elongate hummocks – Established from aerial photographs and LiDAR; line indicates the crest of a conspicuous, sinuous ridge, located in collapsed supraglacial sediment; interpreted as single or coalesced disintegration ridges formed by the subsidence of supraglacial sediment (commonly till) during wastage of the underlying ice; may be apparent on topographic maps and on the ground.

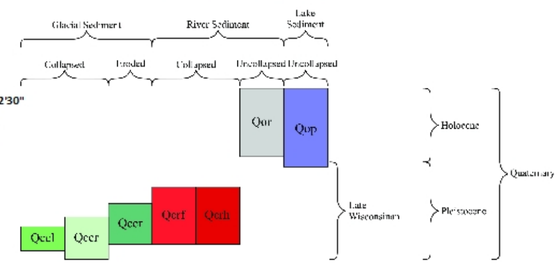
Other lineations – Established from aerial photographs and LiDAR; line marks the long dimension of the feature; located in glacial sediment and thinly veneered glacial sediment; interpreted as streamlined bedforms associated with the movement of glacial ice, or lineations of unknown origin; generally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

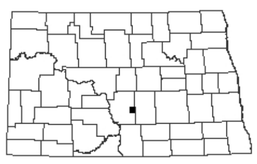
W — **Water**

ROAD CLASSIFICATION

Expressway — Local Connector
Secondary Hwy — Local Road
Ramp — 4WD
Interstate Route — US Route — State Route

Correlation Of Map Units





Clear Lake Quadrangle, North Dakota

Scale 1:24,000

0 0.5 1

Miles

Lambert Conformal Conic Projection
North American 1983 Datum
USGS 7.5 Minute Topo Map

Standard Parallels 46°52'30"N, 47°0'0"N
NGVD 1988

5°25' MN

2019 Magnetic North
Declination at Center of Sheet

Cartographic Compilation: Navin Thapa