North Dakota Geological Survey
24K: Frdv - sg

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Surface Geology
Fordville Quadrangle, North Dakota

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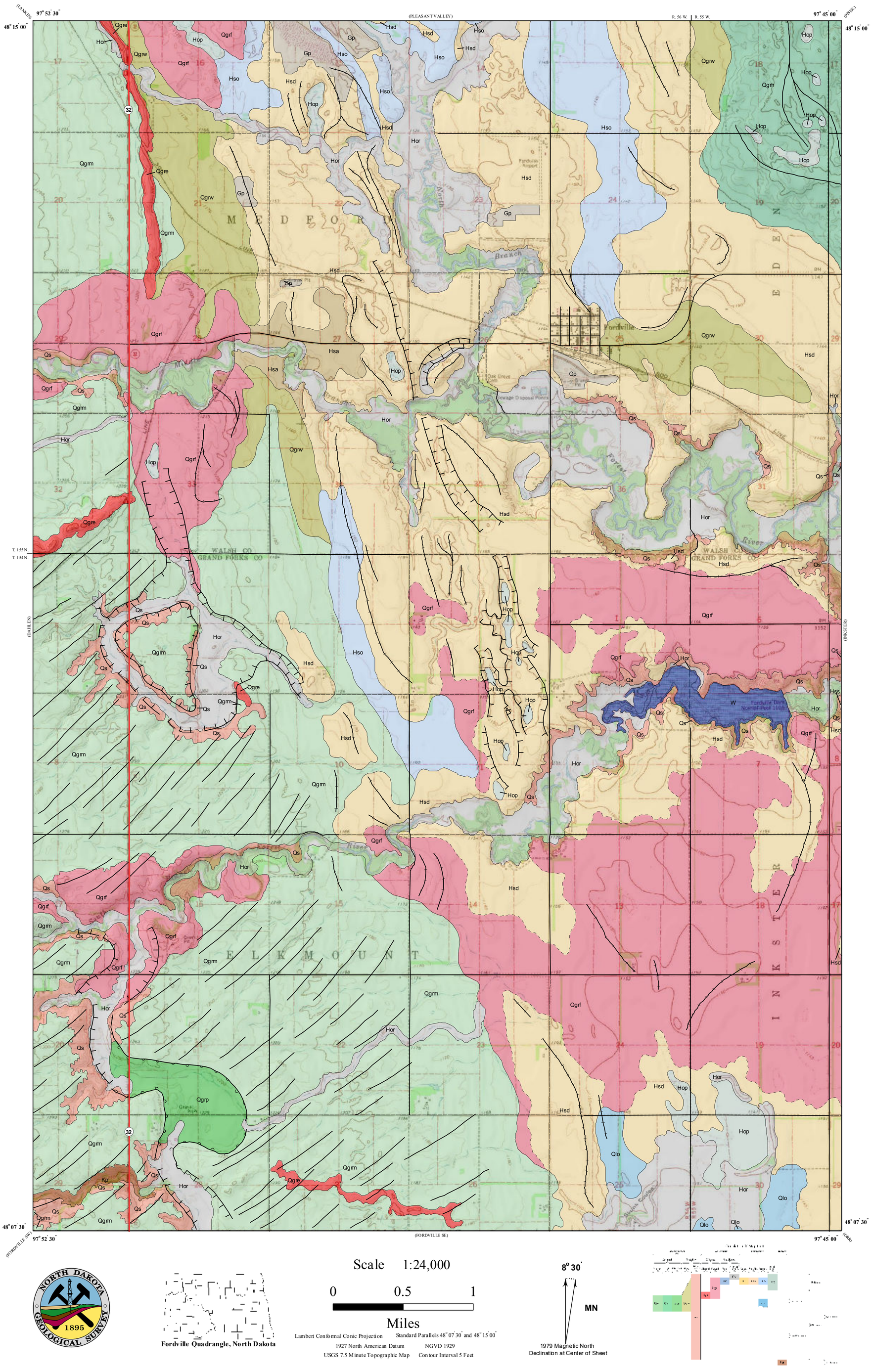
2017



EXPLANATION

Gp — **Gravel Pit (active)**

Gp — **Gravel Pit (Abandoned and/or reclaimed)**

QUATERNARY SYSTEM

HOLOCENE

OAHE FORMATION

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

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.

Hso — **Offshore Lake Sediment**

Laminated clay, clayey silt, silty clay, silt, and sand; clayey in the central part of the Red River Valley and siltier towards the margins; laminations are generally only a few millimeters thick but some of the silty beds are locally several centimeters thick; bedding deformed in places into folds a few feet high and several feet across; light gray when unoxidized and yellowish gray to olive brown when oxidized; wood fragments common in the lower few feet of the formation; as much as 100 feet (33 meters) thick.

Hss — **Shoreline Sediment**

Silt, sand, and gravel; moderately to well-sorted; plane-bedded; to cross-bedded; as much as 18 feet (6 meters) thick; deposited along the shoreline of Lake Agassiz, commonly on eroded till; gravel occurs in beach ridges that are flanked by low-relief, lakeward-sloping areas of silt, sand, and wave-eroded till; beach ridges, spits, and offshore sand bars are shown as line symbols.

Hsd — **Deltaic sediment - sand and gravel**

Moderately well-sorted; low-angle flat-bedded to high-angle cross-bedded grayish brown and yellowish red silt, sand, and gravel deposited in fluvial channels by meltwater streams flowing onto the Elk Valley delta; flat to gently undulating surface commonly with braided channel scars, oxbows, and other relict markings; up to 70 feet (21 meters) thick.

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.

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 northwest (Riding Mountain provenance) of the generally retreating Late Wisconsinan ice sheet into the Red River lowland.

Qgrm — **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-cored glaciated landscape; collapsed glacial sediment with less than 30 feet (10 meters) of relief.

Qgrh — **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-cored glaciated landscape; collapsed glacial sediment with more than 30 feet (10 meters) of relief.

Qgrp — **Clay-loam, pebbly**

Unsorted; unbedded; contains cobbles and boulders; shale pebbles abundant; glacial sediment covering, but not obscuring, pre-existing topography; buried meltwater channels are the most common feature present; may include exposures of sand and gravel; draped (palimpsest) features are visible on aerial photographs "through" the collapsed glacial sediment; deposited on an ice-cored glaciated landscape.

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 releif 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 relict 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.

Qlo — **Offshore lake sediment**

Clay; obscurely laminated to unbedded; dark gray to black.

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.

Palimpsest channel

Established from aerial photographs and LiDAR; lines indicate the crests of the scarps; half-circles indicate the downslope direction; interpreted as a buried meltwater channel; generally apparent on topographic maps, may not be apparent 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.

Sharp scarp

Established from aerial photographs and LiDAR; line indicates the crest of the scarp and the hachures point downslope; easily discernible on topographic maps and on the ground.

Other Features

State Highway (32) — Paved Road — Unpaved Road

Cartographic Compilation: S.S Kranich

NORTH DAKOTA GEOLOGICAL SURVEY 1895

Fordville Quadrangle, North Dakota

Scale 1:24,000

0 0.5 1

Miles

Lambert Conformal Conic Projection — Standard Parallels 48° 07' 30" and 48° 15' 00"
1927 North American Datum — NGVD 1929
USGS 7.5 Minute Topographic Map — Contour Interval 5 Feet

1979 Magnetic North
Declination at Center of Sheet