North Dakota Geological Survey
24K: Artr SE - sg

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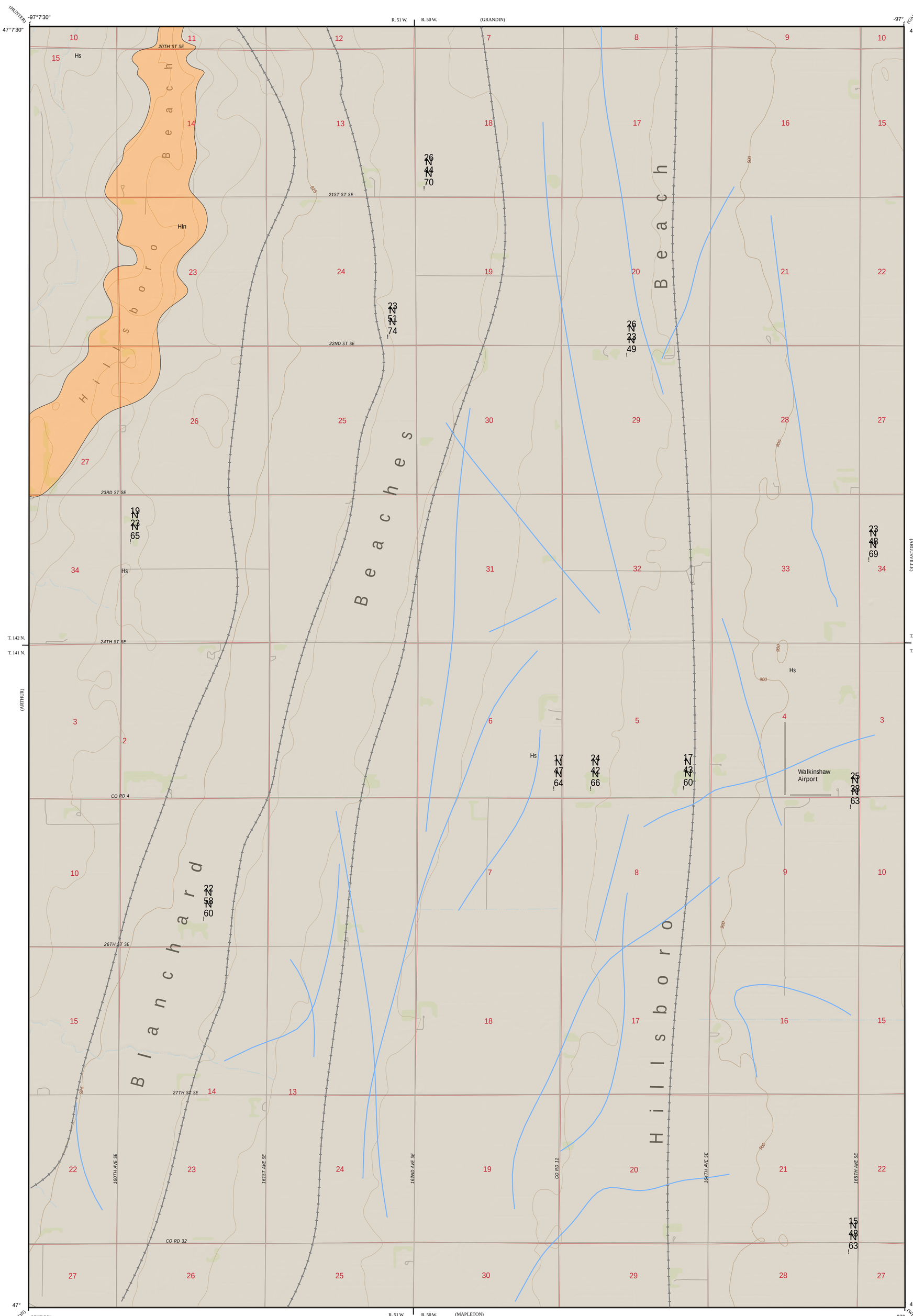
Lynn D. Helms, Director Dept. of Mineral Resources

Surface Geology
Arthur SE Quadrangle, North Dakota



Fred J. Anderson

2024

EXPLANATION

QUATERNARY PERIOD

HOLOCENE EPOCH

Hln GLACIOLACUSTRINE NEARSHORE SEDIMENT
Sand, silt, and clay moderately to well sorted. Flat bedded to cross-bedded. Shallow water beach deposits of the Hillsboro beach.

SHERACK FORMATION

Hs GLACIOLACUSTRINE OFFSHORE SEDIMENT
Yellow-gray, laminated to obscurely bedded, silt, clay, and silty-clay, cohesive. Ranges in thickness between 15 and 26-f within the quadrangle. Glaciolacustrine sediments deposited in offshore environments of glacial Lake Agassiz.

PLEISTOCENE EPOCH

COLEHARBOR GROUP

BRENNA FORMATION

Qb GLACIOLACUSTRINE OFFSHORE SEDIMENT
Not Exposed in Map Area, Shallow Subsurface Unit
Brown to very dark-gray, slightly laminated to unbedded, soft, slickensides. Directly underlies the Sherack Formaton throughout the quadrangle. Depth and thickness values shown at available test hole/well locatons.

BEACH RIDGES
Established from LiDAR maps; line indicates the crest of the ridge or high-water line; interpreted to be a beach ridge along the margin of a lake or high-water level; discernable on LiDAR maps and aerial imagery.

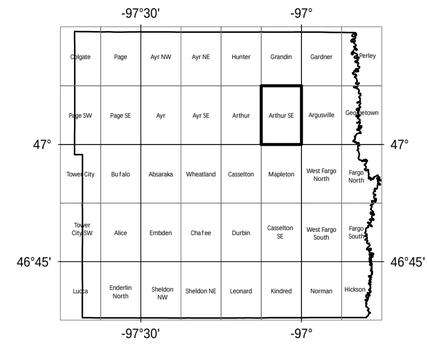
Ice-drag marks
Established from aerial photographs and LiDAR. Low linear ridges and shallow grooves made by glacial icebergs or foatng lake ice in contact with the lake bottom.

Geologic Symbols

Geologic contact (Known)

ECOLOGIC UNIT DEPTHS

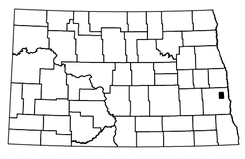
BRENNA FORMATION
Test hole/Well Locaton ● 23' / 48' / 69'
Depth (ft)
Thickness (ft)
First Till Depth (ft)



Index to 1:24,000 Quadrangles, Cass County

CORRELATION OF MAP UNITS

Glaciolacustrine	Glaciolacustrine	Geochronology	
Offshore	*Nearshore*	Epoch	Period
Hs	Hln	Holocene	Quaternary
Qb		Pleistocene	



Arthur SE Quadrangle, North Dakota

Scale 1:24,000

0 0.3 0.5 0.8 1 Miles
0 1,000 2,000 3,000 4,000 Feet
0 0.3 0.5 0.8 1 Kilometers

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

Standard Parallels 47°0'0"N, 47°7'30"N

LiDAR Data Originator:
Internatonal Water Institute, 2010.
Red River Basin Mapping Initatve 2008-2010.
NRCS-Bismarck and ND State Water Commission, 2020,
James River Basin LiDAR Qc2.

3°0' MN

2019 Magnetc North
Declinaton at Center of Sheet

Cartographic Compilaton: Navin Thapa