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Marginal Notes

The Far North Act encourages economic development in Northern Ontario and collaboration between Ontario and First Nations on land use planning. The need for primary landscape data was identified early in the planning stages of the Act, and a terrain mapping project to map surficial materials was initiated by the Ontario Geological Survey to address this data gap. The current surficial geology Far North map publications support the Far North Act and associated land use planning initiatives.

The primary data sources for the terrain mapping project are Sentinel-2 satellite imagery, Ontario Radar Digital Surface Model (Ontario Ministry of Natural Resources and Forestry 2015) and its derivatives, the Ontario Hydro Network (Ontario Ministry of Natural Resources and Forestry 2020) and previous field data and maps. An object-based image analysis software is used in the mapping exercise. The software uses the power of data fusion and method integration to extract feature information. Data fusion combines raster and vector data to identify features based on the information in the spatial data. Method integration allows for the combination of various data analyses, e.g., supervised classification, unsupervised classification, and knowledge-based and machine learning, to identify features based on specific rules. For these maps, a multiresolution segmentation algorithm (eCognition algorithm), using different image layer weights, scale parameters and homogeneity criterion within the software, is used to identify meaningful features representing various surficial material types. The features are then classified based on digital signature, internal variability of signature and the relationship to adjacent features.

Limited helicopter-supported field work, in addition to archival information available for this region and the Far North at large, provided the ground control on the classification of objects (Sanford, Norris and Bostock 1968; Skinner 1973; Sanford and Norris 1975; EBA Engineering Consultants Limited 1976, 1977; Harvey 1979; Ontario Ministry of Natural Resources 1983; Thorlerson, Wyatt and Worman 1993 and their unpublished field notes; Gao, Young and Smylyo 2017; Gao et al. 2018; Geological Survey of Canada, Operation Winkus unpublished field notes; and Riley and Boisjourné unpublished field notes and photographs). Information from the various other Far North Information and Knowledge Management Program projects, such as base data and land cover information (Ontario Ministry of Natural Resources and Forestry 2014), has been used in the interpretation and classification of the surficial materials. The maps show only the surface material distribution. For better definition of wetland types, please see Ontario Ministry of Natural Resources and Forestry (2014). Older Quaternary sediments frequently occur beneath the surface material, as revealed on deeply incised river valleys. However, they are only depicted on the map where their scale is suitable for cartographic presentation.

This project is funded by the Ontario Ministry of Mines. Interaction with the First Nation community members greatly enhanced the map products of the Far North Information and Knowledge Management Program Terrain Mapping Project.

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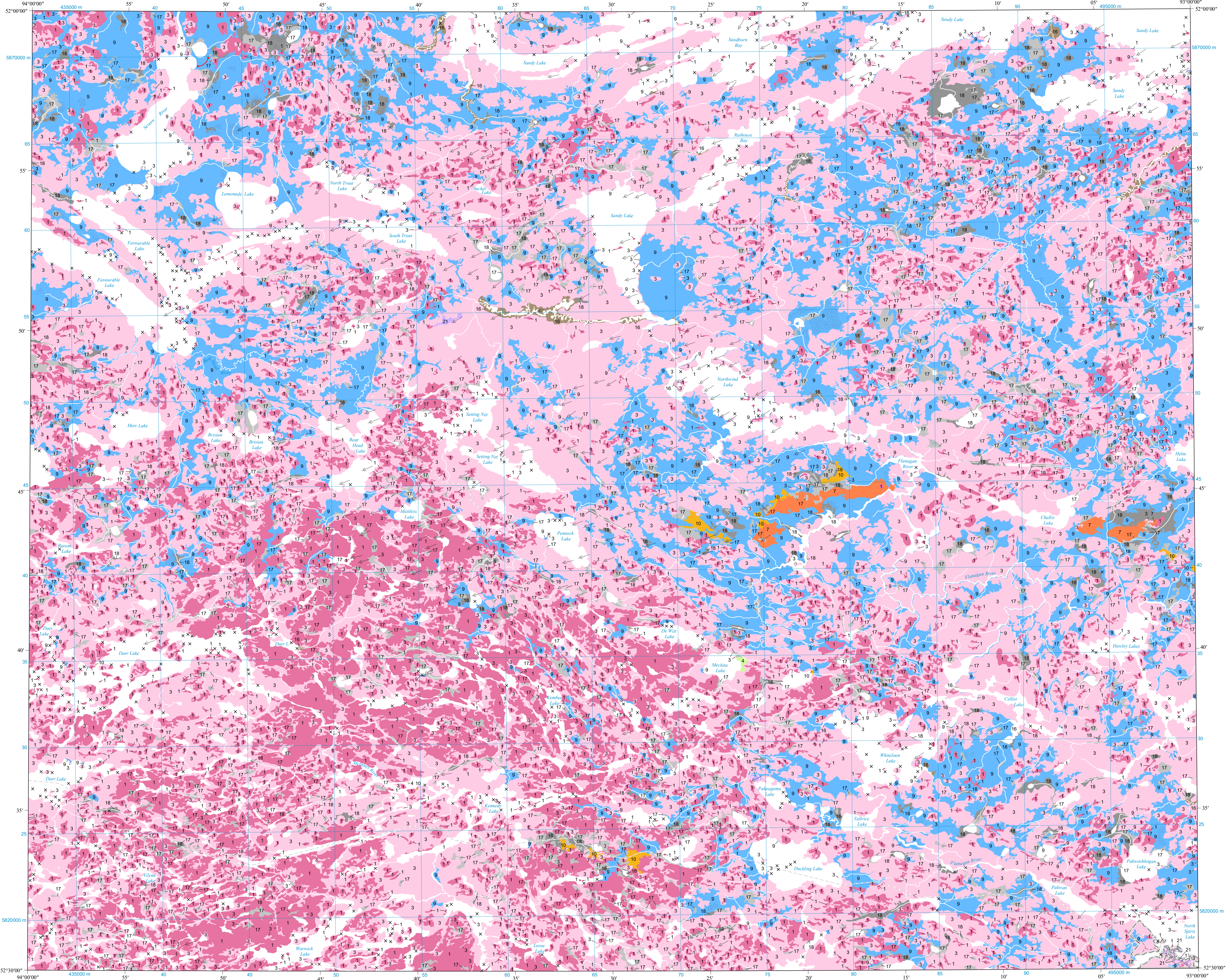
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LEGEND*

PHANEROZOIC

CENOZOIC

QUATERNARY

- 21 Anthropogenic Deposits: Mine tailings, waste rock piles and other man-made features.
- 20 Marine Mud-Flat Deposits: Sand, silt and clay; deposited in mud flats and offshore bars within the tidal zone.
- 19 Marine Salt-Marsh Deposits: Silt and clay with organic matter for minor sand; deposited in salt marshes along present-day coast.
- 18 Organic Deposits: Peat, muck and/or marl; deposited in fen wetlands.^a
- 17 Organic Deposits: Peat, muck and/or marl; deposited in bog wetlands.^a
- 16 Fluvial Deposits (recent): Stratified sand and gravel; may include silt, minor clay. Deposited in bars and channels of present-day rivers and creeks.
- 15 Fluvial Deposits (abandoned): Stratified sand and gravel; may include silt, minor clay. Deposited in bars and channels along abandoned terraces of rivers and creeks.
- 14 Marine Deltic Deposits: Stratified sand and gravel, silt, minor clay. Deposited at the mouths of rivers and creeks entering a postglacial sea.
- 13 Marine Beach and Nearshore Deposits: Stratified sand and gravel; minor silt. Deposited primarily in the shore zone along abandoned terraces of rivers and creeks.
- 12 Marine Basin Deposits: Massive to stratified silt and clay; minor sand. Deposited in basinal areas of a postglacial sea.
- 11 Glaciolacustrine Deltic Deposits: Stratified sand and gravel; may include minor silt and clay. Deposited at the mouths of rivers and creeks entering a proglacial lake.
- 10 Glaciolacustrine Beach and Nearshore Deposits: Stratified sand and gravel; minor silt. Deposited primarily in the shore zone and nearshore zone of a proglacial lake.
- 9 Glaciolacustrine Basin Deposits: Stratified silt and clay; minor sand. Deposited in basinal areas of a proglacial lake.
- 8 Glaciolacustrine Outwash Deposits: Stratified sand and gravel, including minor silt, clay. Deposited in bars and channels in rivers flowing from a glacier.
- 7 Glaciolacustrine Ice-Contact Deposits: Stratified sand and gravel, including minor silt, clay, till and fowlls. Deposited in eskers, kames, deltas and subaqueous fans and in end and recessional moraines along a glacier margin.
- 6 Till: Massive to bedded diamictic; clayey silt to clay matrix. clast content low to moderate, may contain discontinuous layers or lenses of stratified gravel, sand, silt and/or clay; includes fowlls. Deposited at the base or along the margins of a glacier.
- 5 Till: Massive to bedded diamictic; sandy silt to silt matrix (clay bedded in some cases). clast content moderate to high, rare discontinuous layers or lenses of stratified gravel, sand, silt and/or clay, or fowlls. Deposited at the base or along the margins of a glacier.
- 4 Till: Massive to bedded diamictic; silty sand to sand matrix, clast content moderate to high, rare discontinuous layers or lenses of stratified gravel, sand, silt and/or clay, or fowlls. Deposited at the base or along the margins of a glacier.
- 3 Thin Sediment over Bedrock: Thin, near-continuous cover of Quaternary sediments overlying undifferentiated bedrock. Quaternary sediments are commonly less than 1 m thick; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.

PALEOZOIC, MESOZOIC AND CENOZOIC (TERTIARY)

- 2 Bedrock: Undifferentiated bedrock with a thin, discontinuous cover of Quaternary sediments. Quaternary sediments rarely exceed 0.5 m in thickness; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.
- 1 Bedrock: Undifferentiated bedrock with a thin, discontinuous cover of Quaternary sediments. Quaternary sediments rarely exceed 0.5 m in thickness; however, areas of outcrop indicated on the map may contain small areas where the cover exceeds 1 m in thickness, but are too small to delineate at this map scale.

^a The map legend applies to Preliminary Maps P-3625 to P-3758, and P-3767. Deposits on this sheet are mapped primarily where they reach 1 m or more in thickness. Thinner deposits are not generally shown. All legend units or deposit types may not be present on this map.

^b Refer to Ontario Ministry of Natural Resources and Forestry (2014) for better definition of wetland types and distribution.

^c As presented on published and unpublished maps.

^d Numbers, where present, indicate relative ages; 1 = oldest.

Ontario Geological Survey

MAP P.3690

SURFICIAL GEOLOGY

NORTH SPIRIT LAKE AREA

NORTHWEST

NORTHERN ONTARIO

Scale 1:100 000

2000 m 0 2 4 km

NTS References: S3 CH11, 12, 13, 14

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Location Map

1 cm equals 50 km

SYMBOLS*

X Bedrock outcrop (Precambrian) ^a	Trend of esker or esker crest
Extent of mapping	Glacial erosion features carved into the bedrock (includes stratifications, grooves, etc.); direction of ice movement known, unknown ^{b,c}
Lineament observed on remotely sensed images	Crag and tail
Brow of large landslide or failure scar	Streamline form with positive relief; includes drumlins and drummed edges
Base of terraced escarpment (abandoned glaciolacustrine or marine shorewash)	Streamline form with negative relief; includes flutes
Base of terraced escarpment (margin of abandoned or modern, fluvial or glaciolacustrine terrace)	Kettle hole
Trend or crest of abandoned or modern beach bar or spit	Large iceberg load mark
Base of large ice-contact scarp	Large sand dune (aeolian)
Trend of large moraine or moraine crest	Fluvial channel (direction of flow assumed)
Trend of minor moraine or moraine crest; includes De Geer (or washboard) moraines	Forest ring structure (actual size)
Area of hummocky moraine	Area of extensive peatlands
Area of palimpsest moraine	Area of suspected karst features
Area of ribbed landforms; includes Rogen (or ribbed) moraine, scabland, type erosional features and/or megapiles	Province, Indian Reserve, township, part boundary
	Utility
	Road, local road, winter road, trail
	Railroad

^a The symbols list applies to Preliminary Maps P-3625 to P-3758, and P-3767. All symbols may not be present on this map.

^b As presented on published and unpublished maps.

^c Numbers, where present, indicate relative ages; 1 = oldest.

CREDITS

Geology by C. Gao, K.H. Yeung, and field assistants, 2017 and 2018.

Additional symbols digitized by J. Bonin.

Preparation of GIS product by K.H. Yeung.

Cartographic production by D. Štepanović and J. Rickards.

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