Additional field ice flow measurements and station/sample data available from:

McMartin, I., Berman, R.G., Normandeau, P.X., and Percival, J.A., 2013. Till composition of a transect across the Thelon tectonic zone, Queen Maud block, and adjacent Rae craton: results from the Geo-Mapping Frontiers' Chantrey project; Geological Survey of Canada, Open File 7418. doi:10.4095/292801

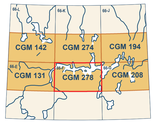
Wright, G.M., 1967. Surficial Geology, Southeastern Barren Grounds, District of Keewatin and District of Mackenzie; Geological Survey of Canada, Map 1217A, scale 1:1 000 000. doi:10.4095/108855

Abstract

Preliminary surficial geology studies, through aerial photograph interpretation and limited legacy data, were undertaken in the north half of the Pelly Lake map area. Widespread streamlined till blanket, hummocky till, till veneer and ridged till which may exhibit small transverse ridges locally, are common across the map area. Drumlinoids and crag-and-tails record a regional north-northwestward ice flow during the last glaciation, with local crosscutting age relationships. Rare morainal ridges indicate recessional or stagnant ice-marginal positions. Northward trending meltwater corridors consist of glaciofluvial sediments, zones of scoured bedrock, lags and streamlined till veneer and streamlined till. Isolated, large lakes of variable extent were formed by ponding of meltwater, and some fine-grained glacial lake sediments are now characterized by shallow thermokarst lakes. Previous levels of Pelly and Garry lakes are estimated on ice-contact deltas at 190–200 m a.s.l. Active eolian activity can occur adjacent to rivers and lakes, associated with glaciofluvial sediments.

Résumé

Nous avons entrepris des études préliminaires de la géologie des formations superficielles de la demie nord du feuillet de la région cartographique de Pelly Lake en se fondant sur l'interprétation de photos aériennes et d'une quantité limitée de données anciennes. L'ensemble de la région cartographique est caractérisée par la présence répandue de nappes de till profilé, de till bosselé, de placages de till et de till à crêtes profilées présentant par endroits de petites crêtes transversales. Des drumlinoïdes et des structures en crag-and-tail révèlent un écoulement glaciaire régional vers le nord–nord-ouest lors de la dernière glaciation, et des relations de recoupement temporaire y sont associées. Quelques moraines rares indiquent les positions de marges glaciaires en retrait ou stagnantes. Des corridors d'eau de fonte de direction nord sont figurés par des sédiments fluvioglaciaires, des zones de socle affouillé, des résidus de défilation de placage de till et des zones de till à crêtes profilées. Des lacs glaciaires isolés et d'étendue variable ont été formés par la rétention d'eau de fonte et les sédiments glaciolacustres à grain fin qui s'y sont accumulés présentent de manière caractéristique à leur surface des lacs thermokarstiques peu profonds. Des deltas juxtaglaciaires ont permis d'estimer à une altitude de 190 à 200 m au-dessus du niveau de la mer d'anciens niveaux des lacs Pelly et Garry. Une activité éolienne peut se manifester dans des sédiments fluvioglaciaires en bordure de rivières et de lacs.



National Topographic System reference and index to adjoining published Geological Survey of Canada maps

Catalogue No. M183-1/278-2016E-PDF
ISBN 978-0-660-04730-0
doi:10.4095/298790

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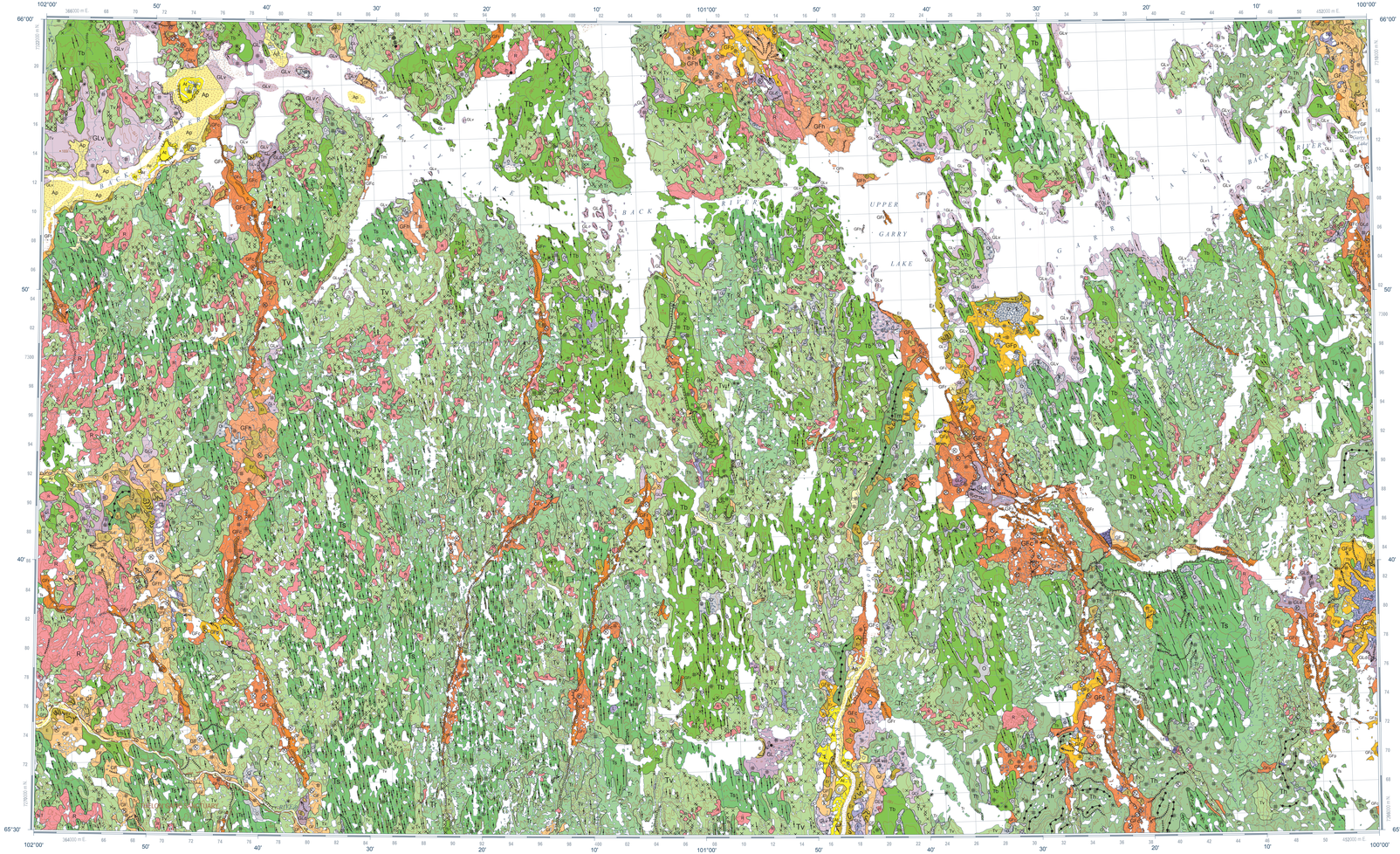
CANADIAN GEOSCIENCE MAP 278
RECONNAISSANCE SURFICIAL GEOLOGY
PELLY LAKE
Nunavut
NTS 66-F north
1:125 000



QUATERNARY

HOLOCENE

NONGLACIAL ENVIRONMENT

- Isn — **Snowpack or ice:** ice and snow; variable thickness; annual or perennial icing accumulations formed along streams or rivers; observed on aerial photographs taken in 1954.
- O — **Organic deposits, undifferentiated:** bog, swamp and shallow lake deposits; variable thickness; generally overlies till, glaciofluvial and lacustrine sediments in low-lying areas.
- Er — **Dune sediments:** sand; variable thickness; active and stabilized parabolic dunes with blow outs; generally associated with reworked glaciofluvial sediments by wind action; local orientation of some dunes suggests two dominant wind directions (north–northwestward and south–southeastward).
- E — **Eolian sediments, undifferentiated:** sand; variable thickness; may include active and stabilized parabolic dunes with blow outs; generally associated with glaciofluvial sediments.
- Ap — **Alluvial floodplain sediments:** sand and gravel; variable thickness; occurs within the seasonal flood plain of rivers and streams entering lakes.
- At — **Alluvial terraced sediments:** sand and gravel; variable thickness; terraced surface may be channelled; occurs above the floodplain as a result of down cutting by the river; may include dunes; may be overlain by organics and exhibiting thermokarst activity.
- A — **Alluvial sediments, undifferentiated:** sand and gravel; variable thickness; may include floodplains, braided and meandering streams and terraces; commonly overlain by organics in low lying areas.
- Ld — **Lacustrine deltaic sediments:** silt and sand; variable thickness; surface flat or channelled; deposited in modern lakes by rivers.
- L — **Lacustrine sediments, undifferentiated:** silt and sand; variable thickness; variable organic cover; modern and drained lakes developed on glaciofluvial, glaciolacustrine sediments and till; some represent oriented lakes whose long axis is generally parallel to some sand dunes; may exhibit thermokarst.

LAST GLACIATION (WISCONSIN)

PROGLACIAL AND GLACIAL ENVIRONMENT

GLACIOLACUSTRINE SEDIMENTS: silt, sand, and gravel deposited in temporary glacier dammed lakes in shallow water and deltaic environments; may include glacial deposits modified by glaciolacustrine processes.

- GLr — **Glaciolacustrine beach sediments:** sand and gravel; variable thickness; forms ridges associated with paleolake levels.
- GLd — **Glaciolacustrine deltaic sediments:** sand and gravel; variable thickness; surface flat, channelled or kettled; deposited in glacially dammed lakes by meltwater; may contain ground ice.
- GLv — **Glaciolacustrine veneer:** silt and sand; less than 2 m thick but may be thicker locally; represent sediments deposited in, or reworked by, isolated glacial lakes; may overlie till or glaciofluvial sediments and be overlain by organics; may exhibit thermokarst activity.
- GL — **Glaciolacustrine sediments, undifferentiated:** silt and sand; variable thickness; represent sediments deposited in, or reworked by, isolated glacial lakes; may overlie till or glaciofluvial sediments and be overlain by organics; may exhibit thermokarst activity and oriented lakes whose long axis is generally parallel to some sand dunes.

GLACIOFLUVIAL SEDIMENTS: sand, gravel and boulders; water-sorted sediments deposited behind, at, and in front of the ice margin, largely as a result of meltwater stream flow.

- GFp — **Glaciofluvial outwash plain sediments:** sand, gravel and boulders; greater than 2 m thick; outwash plains deposited by meltwater streams at or beyond the ice front; dissected by abandoned braided channels; may contain ground ice; may be overlain by organics and exhibit thermokarst activity.
- GFt — **Glaciofluvial terraced sediments:** sand, gravel and boulders; greater than 2 m thick; forming terraces about modern treams and rivers; may contain ground ice, may be overlain by organics and exhibit thermokarst activity.
- GFt1 — **Glaciofluvial subaerial outwash fan sediments:** sand, gravel and boulders; greater than 2 m thick; subaerial outwash fans deposited by meltwater streams at or beyond the ice front; dissected by abandoned braided channels; may contain ground ice, may be overlain by organics and exhibit thermokarts activity.
- GFf — **Glaciofluvial outwash fan sediments:** sand, gravel and boulders; greater than 2 m thick; undifferentiated outwash fans deposited by meltwater streams at or beyond the ice front, dissected by abandoned braided channels; may contain ground ice, may be overlain by organics and exhibit thermokarts activity.
- GFh — **Glaciofluvial hummocky sediments:** sand, gravel and boulders; variable thickness; forming irregular ridges to planar surfaces; deposited by meltwater streams in contact with inactive glacier ice; may contain thermokarst features, ground ice, and host oriented lakes in finer grained sediments.
- GFc — **Glaciofluvial ice-contact sediments:** sand, gravel and boulders; greater than 2 m thick; flat-topped, ridged or kettled; deposited by meltwater streams in contact with glacier ice; may contain ground ice.
- GFr — **Esker sediments:** sand, gravel and boulders; variable thickness; forming eskers and ridges up to several kms long; deposited by meltwater streams flowing within ice tunnels; may contain ground ice.
- GF — **Glaciofluvial sediments, undifferentiated:** sand, gravel and boulders; variable thickness; deposited by meltwater in various environments; may contain ground ice.

GLACIAL ENVIRONMENT

GLACIAL SEDIMENTS (TILL): nonsorted stony diamicton deposited by glacial ice in subglacial and ice marginal environments.

- Th — **Hummocky till:** diamicton; variable thickness but greater than 2 m; forming hillocks, irregular ridges and small moraines associated with stagnant ice; may include small patches of glaciofluvial outwash and ice-wedge polygons; may contain ground ice.
- Tm — **Moraine complex:** diamicton; variable thickness; crested to flat top ridges may indicate recessional or stagnant ice-marginal positions.
- Tr — **Ridged till:** diamicton; variable thickness; contains small transverse ridges (ribbed moraine) generally perpendicular to ice flow; unit may include small isolated patches of scoured bedrock, glaciofluvial deposits, till hummocks and flutings.
- Ts — **Streamlined till:** diamicton; variable thickness but greater than 2 m; individual flutings (drumlinoids, drumlins, and crag-and-tails) seldom exceed 2 km in length.
- Tv — **Till veneer:** diamicton; less than 2 m thick; lodgement and ablation till that mimics underlying bedrock; unit may include small isolated patches of bedrock, glaciofluvial deposits, till blanket and minor transverse ridges; may be reworked by meltwater and glaciolacustrine processes forming lag deposits.
- Tb — **Till blanket:** diamicton; greater than 2 m thick; lodgement or basal meltout till; surface commonly gently rolling and may include flutings and minor moraines; masks underlying bedrock topography; may contain smaller areas of till veneer.

PRE-QUATERNARY

- R — **Bedrock, undifferentiated:** may include patches of till veneer, glaciofluvial sediments, and washed scoured lag.

Complex units: where the surficial cover forms a complex and the map units are too small to be mapped individually, yet constitute a significant component of the total polygon, a dot (".") separates the first dominant map unit designator from the less abundant secondary unit (e.g. Th.GF designates an area of thick till interspersed with glaciofluvial sediments).

- Lag deposits, washed, scoured
- Geological contact, defined
- Dune crest
- Terrace scarp
- Beach crest, trimline
- Minor meltwater channel, sense unknown
- Minor meltwater channel, sense known
- Minor moraine ridge, ribbed moraine, unspecified
- Major moraine ridge, unspecified
- Esker, sense known
- Drumlinoid (1 = oldest, 2 = youngest)
- Drumlin
- Crag-and-tail
- Fluted bedrock, roche moutonnée
- Thermokarst
- Patterned ground (ice wedge polygons)
- Kettle lake
- Kame
- Striation, sense unknown
- Striation, sense known
- Crossed striations (1 = oldest, 2 = youngest)
- Small outcrop
- Sample location

Recommended citation:
St-Onge, D.A. and Kerr, D.E., 2016. Reconnaissance surficial geology, Pelly Lake, Nunavut, NTS 66-F north; Geological Survey of Canada, Canadian Geoscience Map 278 (preliminary), scale 1:125 000. doi:10.4095/298790

Geological Survey of Canada
Canadian Geoscience Maps

Canada

Authors: D.A. St-Onge and D.E. Kerr

Geology based on aerial photograph interpretation by D.A. St-Onge, with revisions and compilation by D.E. Kerr, 2015.

Geology conforms to Surficial Data Model v. 2.1

Geomatics by L. Robertson

Cartography by M.J. Baldock

Initiative of the Geological Survey of Canada, conducted under the auspices of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) program

Map projection: Universal Transverse Mercator, zone 14.
North American Datum 1983

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications.
Elevations in metres above mean sea level

CANADIAN GEOSCIENCE MAP 278
RECONNAISSANCE SURFICIAL GEOLOGY
PELLY LAKE
Nunavut
NTS 66-F north
1:125 000

2 0 2 4 6 8 10 km

Mean magnetic declination 2016, 3°19'E, decreasing 10' annually. Readings vary from 4°51'E in the SW corner to 1°43'E in the NE corner of the map.

This map is not to be used for navigational purposes.

Title photograph: Glacially scoured bedrock and till veneer.
Photograph by P. Normandeau, 2015-132

The Geological Survey of Canada welcomes corrections or additional information from users.

Data may include additional observations not portrayed on this map. *See* map info document accompanying the downloaded data for more information about this publication.

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Preliminary publications in this series have not been scientifically edited.

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