References and additional sources for resource assessments:

Cocking, R.B., Deblonde, C., Kerr, D.E., Campbell, J.E., Eagles, S., Everett, D., Huntley, D.H., Inglis, E., Laviolette, A., Parent, M., Plouffe, A., Robertson, L., Smith, I.R., and Weatherston, A., 2016: Surficial Data Model, version 2.2.0: Revisions to the science language of the integrated Geological Survey of Canada data model for surficial geology maps; Geological Survey of Canada, Open File 8041, 45 p. doi:10.4095/298767

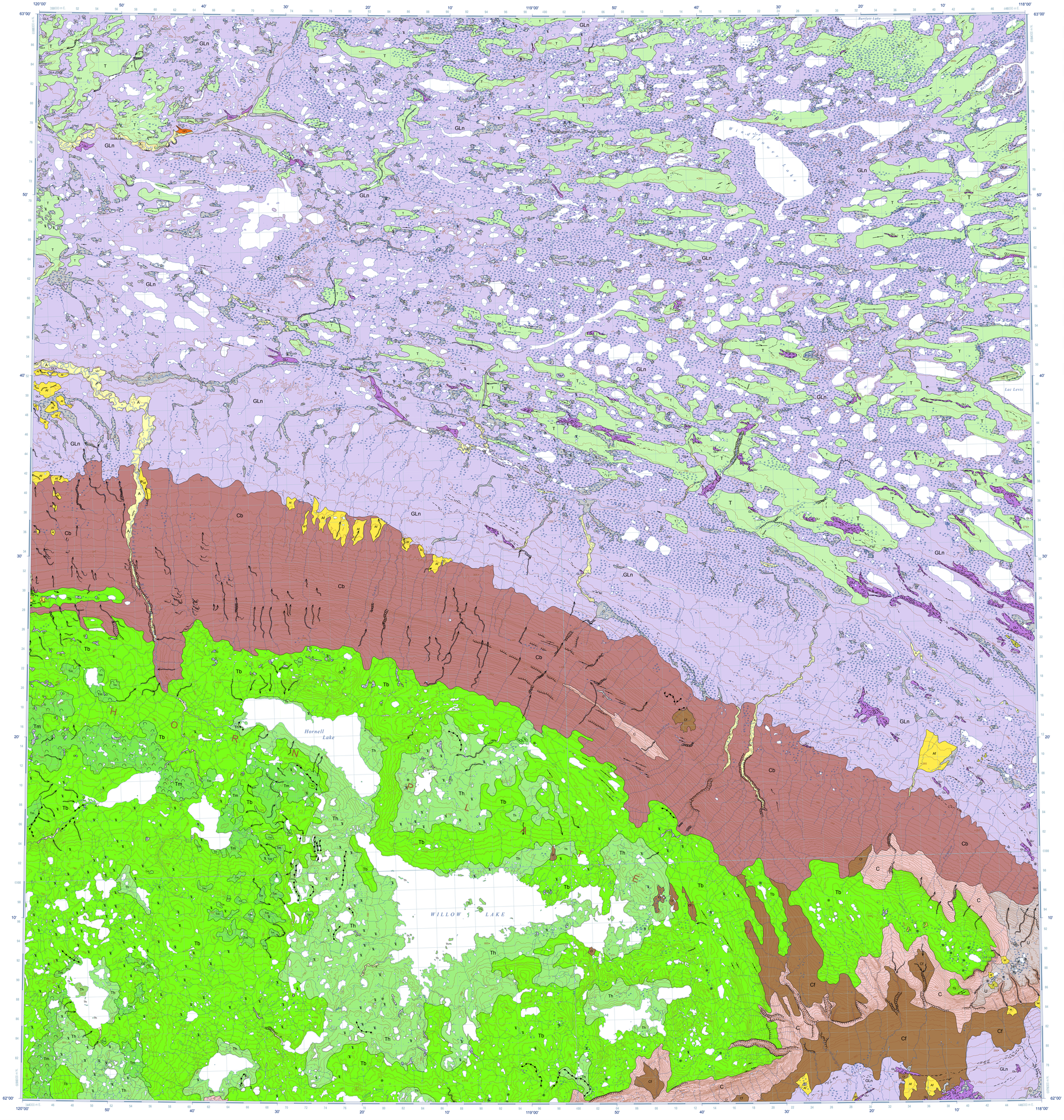
Day S.J.A., Lariviere J.M., McNeil R.J., Friske P.W.B., Cairns S.R., McCurdy M.W., and Wilson, R.S., 2007: Regional stream sediment and water geochemical data, Horn Plateau area, Northwest Territories (Parts of NTS 85E, 85F, 85K, 85L, 95H, 95-I and 95J) including analytical, mineralogical and kimberlite indicator mineral data; Geological Survey of Canada, Open File 5478 / NWT Geoscience Office Contribution 0027; 1 CD-ROM. doi:10.4095/224262

Gal, L.P. and Lariviere, J.M., 2004. Edéhzhie Candidate Protected Area non-renewable resource assessment (Phase I), Northwest Territories, Canada, NTS 085E-F-K-L and 095H-I-J; C.S. Lord Northern Geoscience Centre, Yellowknife, Northwest Territories, NWT Open File 2004-01; 125 p.

Little, E., Huntley, D., Duk-Rodkin, A., Sandeman, H., Sidwell, C., Arnold, H., 2006. New hypotheses resulting from reconnaissance drift and stream sediment sampling surveys in the vicinity of the Horn Plateau, NWT; *in* 34th Annual Yellowknife Geoscience Forum: abstracts of talks and posters; Jones, A.L. and Irwin, D. (comp.); Northwest Territories Geoscience Office, YKGSF Abstracts Volume 2006, p. 88–89.

Mills, A.J., 2008. Phase II Non-renewable resource assessment: analysis and interpretation of regional stream and water sampling results for the Edéhzhie Candidate Protected Area, Northwest Territories; Northwest Territories Open File 2008-03, 209 p.

Williams, G.K., 1977. Some observations on the Horn Plateau, District of Mackenzie; *in* Report of Activities Part B, Geological Survey of Canada, Paper no. 77-1B, p. 191–196.

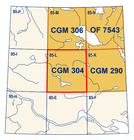


Abstract

Glaciolacustrine sediments, associated with glacial Lake McConnell, were deposited as veneers over till in the broad, poorly drained low-lying areas of the northern, central and southeastern regions of the map area, below 290 m a.s.l. They are commonly overlain by organics and exhibit thermokarst activity. Glaciofluvial sediments and some bedrock ridges were reworked into glaciolacustrine beaches in the eastern lowlands. These beaches, occurring between 220 to 290 m a.s.l., mark the decreasing elevation of the glacial lake over time due to isostatic rebound. In the south, the Horn Plateau, rising to over 700 m, and consisting of till blanket, hummocky till, moraine complex, and colluvium on its slopes, remained above the limit of glaciolacustrine inundation. Crag-and-tails, drumlins and drumlinoids record a westward ice flow during the last glaciation, with local northwestward and southwestward diversions around the Plateau. A series of small moraine ridges on the Plateau may mark the retreat of ice margins or stagnating lobes during deglaciation about 11–10 ka BP.

Résumé

Des sédiments glaciolacustres, associés au Lac glaciaire McConnell, ont été déposés sous forme de placages sur du till dans les vastes étendues mal drainées de faible altitude des secteurs nord, central et sud-est de la région cartographique, à une altitude inférieure à 290 m au-dessus du niveau de la mer. Ils sont habituellement recouverts de matière organique et présentent des signes d'activité thermokarstique. Des sédiments fluvioglaciaires perchés de quelques crêtes rocheuses ont été remaniés sous la forme de plages glaciolacustres dans les basses terres situées à l'est. Ces plages, présentes entre 220 et 290 m au-dessus du niveau de la mer, témoignent de l'altitude décroissante de la surface du lac glaciaire au fil du temps, en raison du relèvement isostatique. Dans le sud, le plateau Horn, s'élevant à plus de 700 m et constitué d'une nappe de till, de till bosselé, d'un complexe morainique et de colluvions sur ses versants, est demeuré au-dessus de la limite de l'inondation glaciolacustre. Des structures en crag-and-tail, des drumlins et des drumlinoïdes rendent compte d'un écoulement glaciaire vers l'ouest au cours de la dernière glaciation, avec des dérivations vers le nord-ouest et le sud-ouest par endroits autour du plateau. Une série de petites crêtes moraniques sur le plateau pourraient marquer la position de marges glaciaires en retrait ou de lobes stagnants pendant la déglaciation à environ 11–10 ka BP.



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

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CANADIAN GEOSCIENCE MAP 304
RECONNAISSANCE SURFICIAL GEOLOGY
WILLOW LAKE
Northwest Territories
NTS 85-L
1:125 000

QUATERNARY
HOLOCENE

POSTGLACIAL ENVIRONMENT

O — **Organic deposits, undifferentiated:** fen, bog; muskeg and floating aquatic vegetation in lakes and ponds; 0.5 to 2 m thick or more; poor surface drainage; widespread and commonly overlies glaciolacustrine sediments and till though not identified on map; may include saline mineral springs north of the Horn Plateau.

E — **Eolian sediments, undifferentiated:** fine to medium sand; variable thickness; may contain dunes and blow outs; derived primarily from glaciofluvial and glaciolacustrine sediments.

Cf — **Colluvial fan sediments:** silt, sand and gravel to angular and rounded cobbles and boulders; variable thickness; fans deposited by intermittent and permanent streams and gravity induced movement on the northern and southern flanks of the Horn Plateau; may include landslide deposits and bedrock exposed in creek beds; may be reworked by wave action forming raised beaches; may include isolated alluvial and outwash sediments.

Cb — **Colluvial blanket:** silt, sand and gravel to angular and rounded cobbles and boulders; variable thickness; deposited by gravity induced movement; predominantly reworked till forming variably gullied terrain by intermittent and permanent streams on the northern flank of the Horn Plateau; may include landslide deposits and bedrock exposed in creek beds; may be reworked by wave action forming raised beaches; may include isolated alluvial and outwash sediments; locally terraced.

C — **Colluvial deposits, undifferentiated:** silt, sand and gravel to angular and rounded cobbles and boulders; variable thickness; deposited by gravity induced movement; forming scree and talus slope deposits along bedrock escarpments; may include landslide deposits.

Af — **Alluvial fan sediments:** silt, sand and gravel; variable thickness; forming coalescing fans by past and present intermittent streams draining the Horn Plateau; locally dissected by meltwater and postglacial streams; may be overlain by organics.

A — **Alluvial sediments, undifferentiated:** silt, sand and gravel; variable thickness; includes meandering stream sediments and seasonally flooded terrain and terraces along modern rivers; may be overlain by organics.

PROGLACIAL AND GLACIAL ENVIRONMENT

GLr — **Glaciolacustrine beach sediments:** sandy gravel, may contain cobbles and boulders; variable thickness; derived mainly from reworked glaciofluvial sediments, forming raised beaches associated with ancestral Great Slave Lake, as a result of isostatic uplift; may also include shingle beaches derived from exposed bedrock outcrops.

GLn — **Glaciolacustrine nearshore sediments:** fine sand to silty clay; variable thickness from 0.25 m to greater than 2 m; associated with ancestral Great Slave Lake and may be undertain by deep water sediments of glacial Lake McConnell in the eastern regions; commonly draped over drumlinoids and flutings but may contain some exposed till; flat plain which may include marl, muskeg and overlain by raised organic deposits of variable thickness; may contain thermokarts features and saline mineral springs north of the Horn Plateau.

GFr — **Glaciofluvial esker sediments:** sand and gravel to cobbles; variable thickness; deposited by glacial meltwater; forming flat-topped ridges deposited in tunnels, channels or openings in glacier; may contain kettles and hummocks; may be reworked by glaciolacustrine wave action.

GLACIAL ENVIRONMENT

Th — **Hummocky till:** silt to gravel diamicton; poorly sorted; variable thickness but generally greater than 2 m; deposited directly by glacier; forms irregular mounds, ridges and moraines on the Horn Plateau; contains thermokarst terrain; may be dissected by meltwater streams.

Tm — **Moraine complex:** silt to gravel diamicton; poorly sorted; variable thickness but generally greater than 2 m; deposited directly by glacier; forms irregular hummocks, knolls, short small ridges and moraines at highest elevations on the Horn Plateau; may be dissected by meltwater streams and contain pitted surfaces with small kettle lakes and ponds.

Ts — **Steamlined till:** silt to gravel diamicton; poorly sorted; variable thickness but generally greater than 2 m; fluted; deposited directly by ice at the base of glacier.

Tb — **Till blanket:** silt to gravel diamicton; poorly sorted; variable thickness but greater than 2 m; undifferentiated glacial, alluvial, colluvial and organic deposits associated with the Horn Plateau; forming rounded gullied hills and plateaux, small alluvial and colluvial fans, thermokarst lakes and ponds; locally fluted; may contain small outcrops and till veneer.

T — **Till, undifferentiated:** silt to gravel and bouldery diamicton; poorly sorted; variable thickness but generally greater than 2 m; locally modified by glaciolacustrine, lacustrine and eolian processes during isostatic uplift; surface may contain small sand and gravel areas of glaciolacustrine veneer, buried or reworked eskers and drumlinoids; may be overlain by organics and include saline mineral springs north of the Horn Plateau.

U — **Undifferentiated deposits:** silt to gravel diamicton; poorly sorted; contains locally-derived and Shield lithologies; variable thickness; undifferentiated glacial, alluvial, colluvial and organic deposits associated with the lower easternmost region of the Horn Plateau; may include thermokarst lakes.

Thermokarst depression

Patterned ground, ice wedge

Geological contact, defined

Terrace scarp

Beach crest, depositional and erosional

Meltwater channel:
- *Lateral*
- *Minor, direction unknown*
- *Minor, direction known*

Moraine ridge:
- *Minor, unspecified*
- *Major, unspecified*

Esker ridge, with beach ridges, direction known

Drumlinoid ridge

Drumlin

Crag-and-tail

Hummock

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Canadian Geoscience Maps

Canada

Authors: D.E. Kerr, P.D. Morse, and S.A. Wolfe

Geology by D.E. Kerr, based on airphoto interpretation of 1:60 000 scale photos taken in 1954, and P.D. Morse, remote imagery analysis, 2015, 2016.

Geology conforms to Surficial Data Model v. 2.2

Geomatics by L. Robertson

Cartography by M.J. Baldock

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

Map projection Universal Transverse Mercator, zone 11.
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 304
RECONNAISSANCE SURFICIAL GEOLOGY
WILLOW LAKE
Northwest Territories
NTS 85-L
1:125 000

2 0 2 4 6 8 10 km

Mean magnetic declination 2017, 18°52'E, decreasing 21.6' annually. Readings vary from 19°20'E in the NW corner to 18°21'E in the SE corner of the map.

This map is not to be used for navigational purposes.

Title photograph: Stream following a meltwater channel eroded through till on north slope of the Horn Plateau, Northwest Territories. Photograph by S.J.A. Day, 2016-078

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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