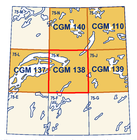
Abstract

The Reliance map area is characterized by three main elements based on distribution and nature of surficial sediments. The northeast and southeast map areas have a greater cover of fluted and drumlinized till blanket, with some transitional till veneer. Throughout the rest of the map sheet, extensive areas of bedrock predominate, with minor isolated deposits of till. The Lockhart and Snowdrift river valleys are predominantly infilled by meandering alluvial and terraced glaciofluvial sediments, some with active dunes. In these valleys, terraces and outwash plains occur at various elevations, including 230 m, 245 m, 260 m, 305 m, and 320 m a.s.l. Some may be related to glacial Lake McConnell, as are raised beaches at 335 m a.s.l. in McLeod Bay. Glaciofluvial corridors, of various magnitudes, consisting of eskers, ice-contact sediments, and scoured bedrock, trend generally southwestward to westward across the map area. Isolated glaciolacustrine deltas record local ponding of glacial meltwater. The last dominant ice flow varied from southwestward to westward.

Résumé

La région de la carte Reliance est caractérisée par trois éléments principaux, déterminés selon la répartition et nature des sédiments superficiels. Dans les parties nord-est et sud-est de la région se trouve une couverture plus importante sous forme de nappes de till cannelé à drumlins, avec quelques placages de till transitionnels. Le reste de la région de la carte est dominé par de vastes zones du substratum rocheux comportant de petits dépôts de till isolés. Les vallées des rivières Lockhart et Snowdrift sont remplies principalement de sédiments fluvioglaciaires et alluviaux en terrasses qui présentent, par endroits, des dunes actives. Dans ces vallées, les terrasses et les plaines d'épandage fluvioglaciaires se trouvent à diverses altitudes, notamment à 230 m, 245 m, 260 m, 305 m et 320 m au-dessus du niveau de la mer. Certaines peuvent être liées au Lac glaciaire McConnell, tout comme les plages soulevées à 335 m, dans la baie McLeod. Des couloirs fluvioglaciaires, constitués d'eskers, de sédiments de contact glaciaire et de substratum rocheux décapé, ont généralement une orientation sud-ouest à ouest. Des deltas glaciolacustres isolés témoignent de la formation, par endroits, d'étangs d'eau de fonte glaciaire. La direction du dernier écoulement glaciaire dominant variait du sud-ouest à l'ouest.



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

Cover illustration
Active compound-parabolic sand dunes in the valley of the meandering Snowdrift River. Photograph by R.D. Knight. 2013-205

Catalogue No. M183-1/138-2013E-PDF
ISBN 987-1-100-22682-6
doi:10.4095/293424

© Her Majesty the Queen in Right of Canada 2014

Natural Resources Canada | Ressources naturelles du Canada

CANADIAN GEOSCIENCE MAP 138

SURFICIAL GEOLOGY

RELIANCE

Northwest Territories

NTS 75-K

1:125 000

QUATERNARY

HOLOCENE

NONGLACIAL ENVIRONMENT

- **O** — **Organic deposits, undifferentiated:** peat and muck up to 2 m thick; formed predominantly by the accumulation of vegetative material in bogs; occurs in depressions, poorly drained areas and along valley bottoms; may contain ice-wedge polygons; small unmapped organic deposits occur in most terrain units.
- **E** — **Eolian sediments, undifferentiated:** fine to medium sand; undifferentiated to well-sorted; 1 to at least 4 m thick; may contain active and stabilized dunes (compound-parabolic dunes) and blowouts; derived from glaciofluvial deposits.
- **C** — **Colluvial deposits, undifferentiated:** angular pebbles, cobbles to boulders, minor diamicton; massive to stratified; up to 10 m thick; apron and talus scree deposits, formed predominantly from weathering and frost shattering of bedrock along escarpments; may include colluviated glaciolacustrine sediments and washed till.
- **Ap** — **Alluvial floodplain sediments:** silt to gravel; massive to stratified; 1 m to at least 3 m thick; deposited by modern streams and rivers; may include floodplains and alluvial fans in braided and meandering rivers.

LAST GLACIATION (WISCONSIN)

PROGLACIAL AND GLACIAL ENVIRONMENT

- **GLd** — **Glaciolacustrine deltaic sediments:** sand, gravel, and cobbles, massive to cross-stratified; up to 5 m or more thick; associated with temporary glacier-dammed lakes; may exhibit kettle lakes, braided paleochannels, ice-wedge polygons, and beach ridges; may contain massive ground ice.
- **GL** — **Glaciolacustrine sediments:** undifferentiated: fine-grained sediments, variable thickness, associated with glacial lakes fed by meltwater during deglaciation; may include postglacial lacustrine sediments and areas of washed till and colluviated deposits on steeper slopes.
- **GFr** — **Glaciofluvial esker sediments:** sand, gravel, cobbles and small boulders; in planar, cross-stratified, and massive beds; 1 to at least 30 m thick; forms ridges with both sharp-crested and flat-topped segments up to 20 km long, and 10 to 250 m wide with mounds and flanking aprons; deposited at or behind the ice margin; formed subglacially or in subaerially exposed ice-walled channels; may be associated with zones of scoured rock and till veneer, boulder lags, isolated kame deposits, and small transverse gravel ridges.
- **GFp** — **Glaciofluvial outwash plain sediments:** sand and gravel; massive to cross-stratified; 3 m to at least 20 m thick, generally flat-topped; occur as plains, may include terraces, deltas, ice-contact sediments, and subaqueous fans.
- **GFc** — **Glaciofluvial ice-contact sediments:** sand and gravel; massive to cross-stratified; 3 m to at least 10 m thick; flat-topped to irregular hummocky topography with kettle lakes, may include small eskers.
- **GFb** — **Glaciofluvial blanket:** sand and gravel, >2 m thick, locally occurs where glaciofluvial features are superimposed on top of, or occur between, isolated till deposits (till erosional remnants).
- **GF** — **Glaciofluvial sediments, undifferentiated:** sand and gravel, variable thickness, usually small areas lacking well-developed surface expression.

GLACIAL ENVIRONMENT

- **Tv** — **Till veneer:** diamicton; low compaction; less than 1–2 m thick; occurs as a discontinuous layer where rock structure is generally visible, and as a lag on washed bedrock; may include outcrops and raised beaches shown by symbols, and small isolated units of glaciolacustrine and glaciofluvial sediments and till blanket.
- **Th** — **Hummocky till:** diamicton, >2 m thick, hummocky surface expression; forms hills and hollows.
- **Tb** — **Till blanket:** diamicton, >2 m thick, commonly occurs in association with organics in lowlands, till veneer or streamlined till.

PRE-QUATERNARY

- **R** — **Bedrock, undifferentiated:** bedrock with variable surficial veneer (generally till), bedrock structure and topography readily apparent.

NOTES:

Stratigraphic relationship: map unit stratigraphy is shown with a maximum of two map unit designators separated by a slash ("/") (e.g. Cv/Tb designates colluvial veneer overlying till blanket).

Complex units: where the surficial cover forms a complex and the map units are too small to be mapped individually, yet constitutes a significant aerial extent of the total polygon, a dot (".") separates the first dominant map unit designator from the less abundant secondary unit (e.g. Tb.O designates an area of till blanket with some areas of organics).

- Washed scoured lag
- Geological contact, defined
- Terrace scarp
- Terrace scarp, glaciofluvial
- Beach crest
- Minor meltwater channel, sense unknown
- Minor meltwater channel, sense known
- Minor moraine ridge, other unspecified
- Esker, sense unknown
- Esker, sense known
- Drumlinoid
- Drumlin
- Crag-and-tail
- Fluted bedrock, sense unknown
- Fluted bedrock (roche moutonnée), sense known
- Paleocurrent measurement, bedrock erosional form (S-form)
- Patterned ground (ice-wedge polygons)
- Kame
- Striation, sense known, poorly defined
- Striation, sense unknown
- Striation, sense known
- Ice-flow measurement - crossed striae
- Small outcrop
- Sample location

REFERENCES

Wright, D.F., Ambrose, E.J., Lemkow, D., and Bohnum-Carter, G.F. (ed.). 2013. Mineral and energy resource assessment of the proposed Thaidene Nene National Park Reserve in the area of the East Arm of Great Slave Lake, Northwest Territories; Geological Survey of Canada, Open File 7196. doi:10.4095/292447

Additional siltation data from:

Brown, I.C., 1950. Preliminary Map 50-15A, Reliance, Northwest Territories; Geological Survey of Canada, Paper 50-15.

Recommended citation
Kerr, D.E., Knight, R.D., Sharpe, D.R., and Cummings, D.I., 2014. Surficial geology, Reliance, Northwest Territories, NTS 75-K; Geological Survey of Canada, Canadian Geoscience Map 138 (preliminary), scale 1:125 000. doi:10.4095/293424

ess.nrcan.gc.ca

Canadian Geoscience Maps

Canada

Authors: D.E. Kerr, R.D. Knight, D.R. Sharpe, and D.I. Cummings

Geology based on aerial photograph interpretation by D.E. Kerr, 2008, 2009, 2012, 2013 with field work by D.E. Kerr, R.D. Knight, D.R. Sharpe, D.I. Cummings and B.A. Kjarsgaard, 2008; D.E. Kerr and R.D. Knight, 2009. Geology of the southernmost one quarter on the map sheet based on aerial photograph interpretation only. Related geological data can be found in Wright et al., (ed.), 2013.

Geomatics by L. Robertson

Cartography by E. Everett, M. O'Neill, and L. Robertson

Initiative of the Geological Survey of Canada, conducted under the auspices of the Mineral and Energy Resources Assessment (MERA) for the Proposed East Arm National Park, and the Tri Territorial Surficial Database Project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals program.

Map projection Universal Transverse Mercator, zone 12. North American Datum 1983

CANADIAN GEOSCIENCE MAP 138

SURFICIAL GEOLOGY

RELIANCE

Northwest Territories

NTS 75-K

1:125 000

2 0 2 4 6 8 10km

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

Mean magnetic declination 2014, 13°32'E, decreasing 24' annually. Readings vary from 12°36'E in the SE corner to 14°27'E in the NW corner of the map.

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

Data may include additional observations not portrayed on this map.*See* documentation accompanying the data.

This publication is available for free download through GEOSCAN (http://geoscan.ess.nrcan.gc.ca/).

This map is not to be used for navigational purposes.

Preliminary publications in this series have not been scientifically edited.

CANADIAN GEOSCIENCE MAP 138

SURFICIAL GEOLOGY

RELIANCE

Northwest Territories

NTS 75-K