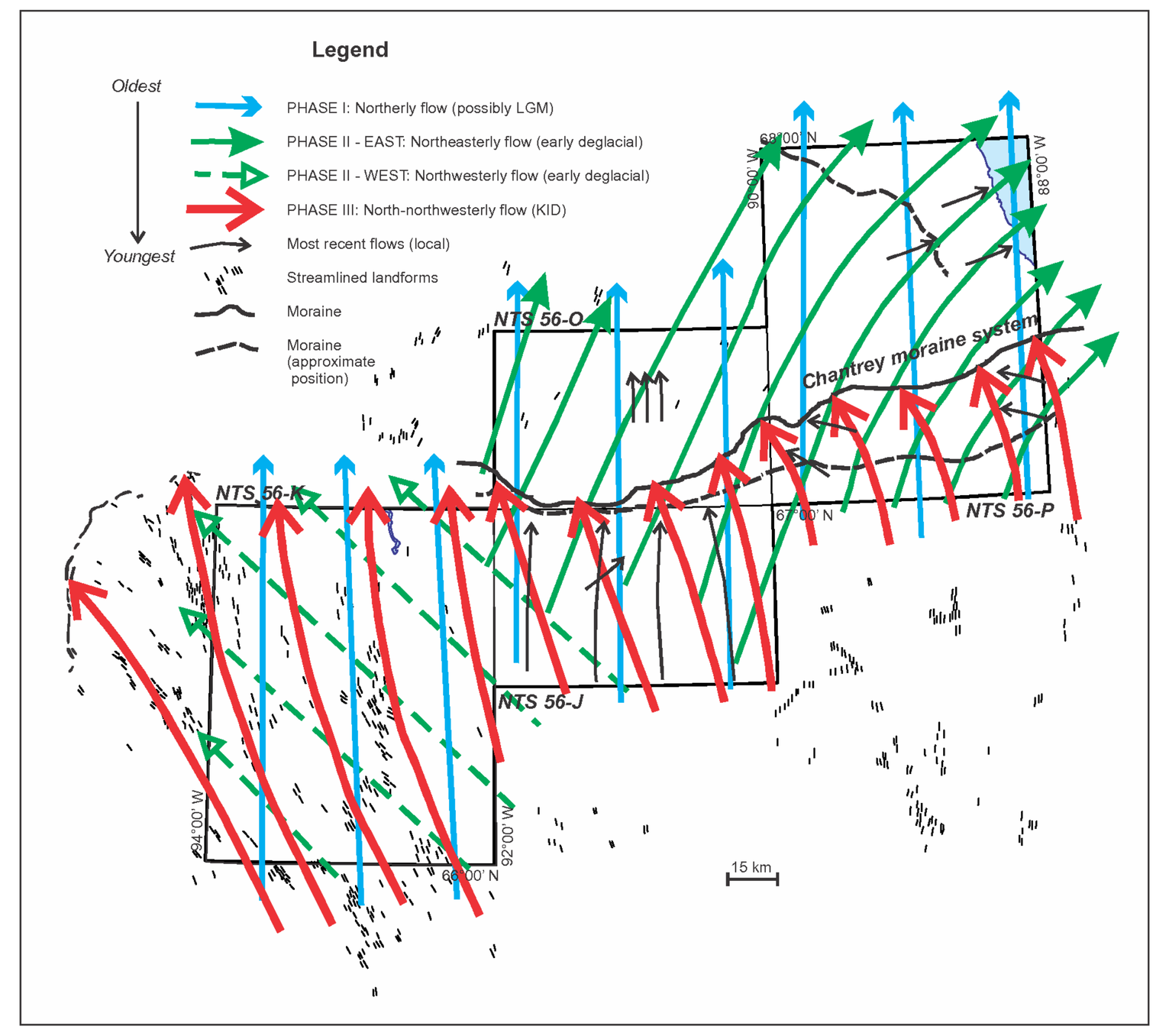


Figure 1. Regional ice flow and chronology. Generalised regional ice flow and chronology interpreted from ice-movement indicators recorded during field mapping in the TGI-1 Committee Bay study area from 2000 to 2002. Morainal features outside the study area and all streamlined landforms are from Aylsworth and Shilts (1989) (after McMartin et al., 2003).

Sample ID	Easting	Northing	UTM	Boulder Lithology	Boulder Dimensions (cm) Length	Width	Height	Sample Volume (cm) Length	Width	Height	Age (Cal. Years BP)
02EL501	377847	7468470	16	Medium-grained Granodiorite: ±Hornblende, ± biotite	227	159	166	20*	9*	7.5*	12.1 ± 2.42

*Two closely spaced sub-samples of the same volume were combined in order to obtain enough material for analysis.

Table 1. Terrestrial cosmogenic nuclide (TCN) age and associated data obtained from boulders sitting in a thin veneer of till north of the Chantrey moraine system (Little, 2006).

Note: This Terrestrial cosmogenic nuclide (TCN) age and associated data was previously published by Little (2006). The age was calculated using CHLOE3 (Phillips and Plummer, 1996). Production rate used in age calculation follows Phillips et al. (1996). No erosion, snow cover, or inheritance corrections were considered for the age presented.

Abstract

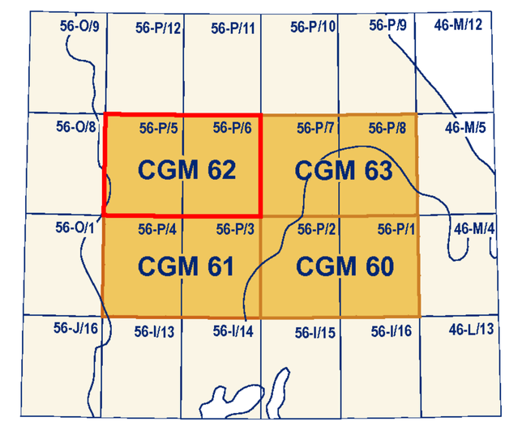
The surficial geology mapping of the southern half of the Ellice Hills map sheet (NTS 56-P-south) was undertaken as part of the Targeted Geoscience Initiative-1 multidisciplinary Committee Bay Project in 2002, and completed in 2010 under the GEM Multiple Metals–Melville Peninsula project. Regional till sampling for matrix geochemistry, kimberlite indicator minerals, and gold grain counts were carried out in conjunction with the mapping (McMartin et al., 2003b; Little, 2004).

The Ellice Hills-South area lies entirely within the Gulf of Boothia drainage basin. The topography is dominated by broad, terraced valleys, streamlined to rolling till plains, high amplitude hummocky till-glaciofluvial corridors, and rugged bedrock terrain where supracrustal rocks are exposed. In the extreme northwest (NTS 56-P/7-8), gullied plains and veneers of marine sands, silts, and clays dominate the landscape. During the last glaciation the area was covered by ice flowing generally northward from the Keewatin Ice Divide located to the south. The limit of marine incursion as the ice retreated is approximately 240–250 m a.s.l. (Giangioppi et al., 2003). The extensive Chantrey moraine system traverses the area from east to west marking a significant stillstand of the retreating ice margin.

Résumé

La cartographie de la géologie de surface de la moitié sud du feuillet de Ellice Hills (SNRC 56-P-Sud) a été entreprise sous le projet multidisciplinaire de Committee Bay de l'Initiative Géoscientifique Ciblée -1 en 2002 et achevée en 2010 dans le cadre du projet sur les gisements polymétalliques de la presqu'île Melville sous le programme de géocartographie de l'énergie et des minéraux (GEM). L'échantillonnage régional de la géochimie de la matrice du till, des minéraux indicateurs de kimberlite et des grains d'or a été mené conjointement avec la cartographie (McMartin et al., 2003b; Little, 2004).

La région d'étude de Ellice Hills-sud se trouve entièrement dans le bassin de drainage du golfe de Boothia. La topographie est dominée par des vallées larges en terrasses, des plaines de till ondulées à fuselées, des couloirs de till bosselé et de sédiments fluvio-glaciaires de forte amplitude, et de terrain accidenté rocheux où sont exposées des roches supracrustales. Dans l'extrême nord-ouest (SNRC 56-P/7-8), les plaines ravinées et les placages de sables marins, limons et argiles dominent le paysage. Au cours de la dernière glaciation, la région était couverte de glace s'écoulant généralement vers le Nord depuis la ligne de partage glaciaire du Keewatin située au sud. La limite de l'incursion marine alors que la glace se retirait est environ 240-250 m ASL (Giangioppi et al., 2003). Le vaste système de moraine Chantrey traverse la région de l'est à l'ouest marquant une pause significative de la marge glaciaire en recul.



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

Cover illustration
Looking north along a sandy esker system flanked by hummocky eroded till plain, NTS 56-P/1 southeast. Photograph by J.E. Campbell. 2013-076

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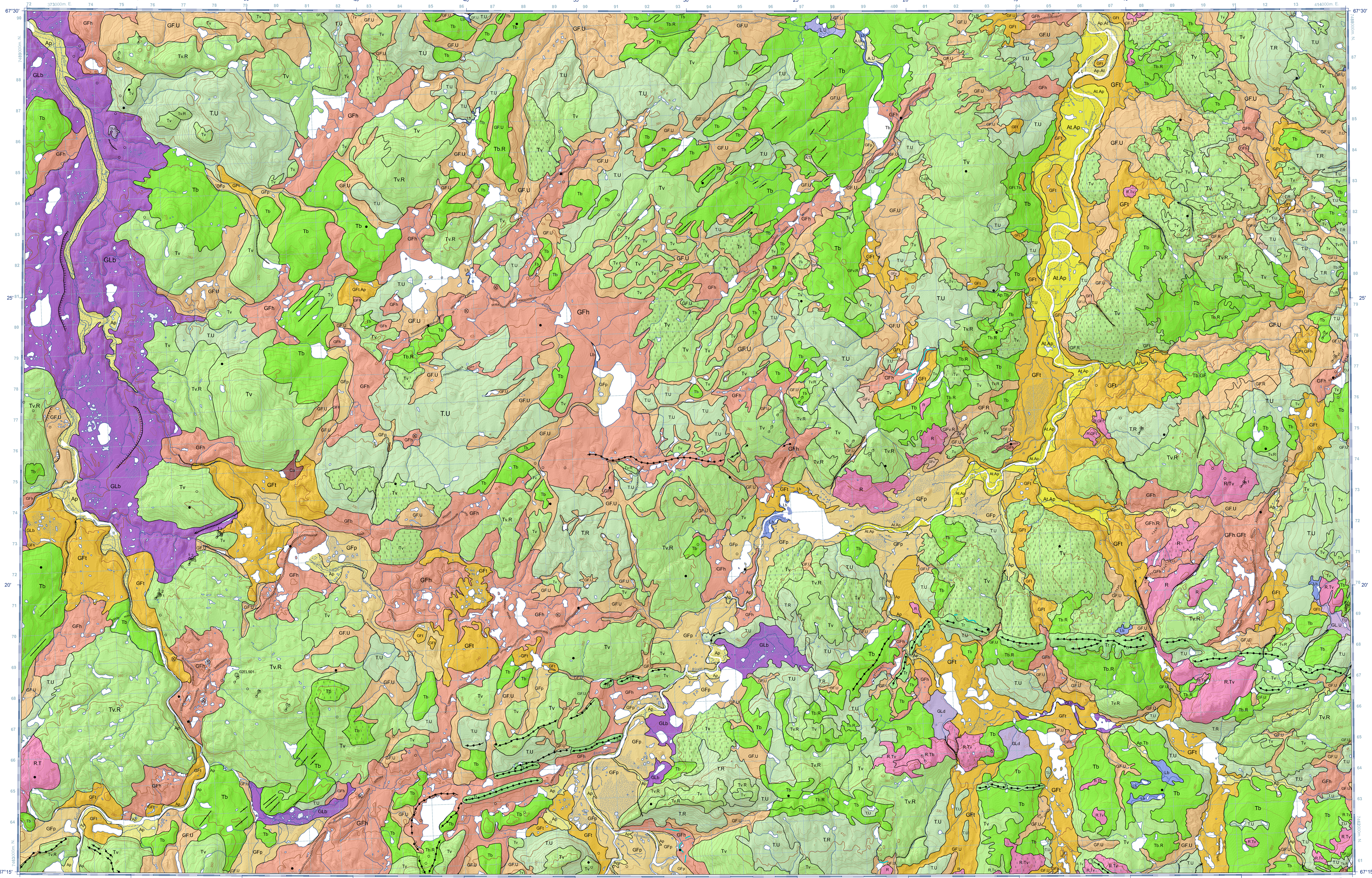
Natural Resources Canada / Ressources naturelles du Canada

CANADIAN GEOSCIENCE MAP 62
SURFICIAL GEOLOGY
ATORQUAIT RIVER
Nunavut
1:50 000



The surficial deposits legend is based on Little's (2006) legend for the Ellice Hill (north) map sheets (NTS 56-P-north) and has been modified to better align with the current Geological Survey of Canada's surficial data model (Deblonde et al., 2012). Single surficial deposit units reflect the dominant material and locally may be interspersed with <10% other surficial materials, including bedrock outcrop. This legend is common to CGM 60, CGM 61, CGM 62, and CGM 63. Coloured legend blocks indicate map units that appear on this map. Not all symbols shown in the legend appear on this map.

QUATERNARY
SURFICIAL DEPOSITS
HOLOCENE

ALLUVIAL DEPOSITS: Silt, sand, and gravel deposited by modern streams and rivers either within channels or as overbank deposits. Deposits are usually stratified and, with the exception of some alluvial fan deposits, moderately to well sorted.

Ap — **Floodplain sediments:** predominantly sands and gravels; may be locally overlain by, or include, lacustrine silt, clay and minor peat and organic detritus; forming active floodplains close to river and stream level; includes terraces too small to show at this map scale. Typically forms plains within approximately 1 m of present stream level. Thickness up to 5 m.

At — **Alluvial terraces:** massive to stratified, moderately to well sorted sand and gravel with minor silt. Sediments are of floodplain origin and presently isolated from flooding by stream incision. Thickness ranges from sporadic cover on bedrock to several metres.

Af — **Fan sediments:** gravel and gravelly diamicton, stratified, poorly to moderately sorted. Forms fan-shaped landforms where streams enter larger valleys. Thickness can reach up to 10 m.

A — **Alluvial undifferentiated:** comprised of alluvial sediments that cannot be differentiated or defined by deposit type.

COLLUVIAL DEPOSITS: Poorly sorted, unconsolidated debris (diamicton) deposited on slopes; derived from bedrock or glacial deposits; typically less than 1 m thick, but can reach thicknesses up to 10 m.

Ca — **Apron deposits:** stratified diamicton, and poorly sorted sand and gravel. Deposit forms a wedge-shaped, slope-toe complex at base of steep slopes comprised of relatively small steep debris flows, free-fall material and solifluction deposits derived from bedrock and glacial deposits. Thickness up to 10 m, thinning at head and toe of deposit.

Cz — **Landslide deposits:** diamicton formed of broken rock, soil and glacial deposits. Forms a hummocky or ridged topography with ridges transverse to direction of movement. Thickness is highly variable, but may range up to 10 m (Direction of movement indicated by symbol).

LACUSTRINE DEPOSITS: Includes laminated to massive clay, silt, and sand with minor organics as well as littoral sands, silts and gravel; deposited in and adjacent to modern lakes.

Lb — **Blanket sediments:** laminated to massive clay, silt, and sand with minor organics. Local relief is less than 1 m (plain) and masks the underlying topography. Thickness is greater than 2 m.

L — **Lacustrine undifferentiated:** comprised of alluvial sediments that cannot be differentiated or defined by deposit type.

HOLOCENE - LATE PLEISTOCENE

MARINE DEPOSITS: Sediments deposited in a marine environment within a high postglacial sea; deposited primarily from suspension and submarine gravity flows; also includes sediments that accumulate in the littoral zone. May include glaciomarine sediments where undistinguishable from marine sediments.

Mv — **Sediment veneer:** stratified to massive gravel, sand, silt, and clay with thicknesses less than 2 m; discontinuous cover of littoral and offshore sediments interspersed with till and bedrock; mimic underlying topography.

Mb — **Blanket sediments:** marine silts, clays, and fine sand forming a continuous cover that generally masks underlying bedrock and sediments; thickness is greater than 2 m but locally can be greater than 20 m; massive to rhythmically stratified; locally fossiliferous; predominantly deposited in an offshore environment.

Mr — **Littoral sediments:** sand and gravel; generally well sorted material that locally includes pockets of washed till. Usually forms flights of beach ridges (raised beaches), bars, spits, terraces and ice-pushed ridges commonly strewn with boulder lags. Derived from reworking of surficial deposits; occurs commonly on the slopes of topographic highs. Thickness ranges from 1–5 m.

Mn — **Nearshore and tidal flat sediments:** massive to stratified sand, silty-sand to silt and minor clay, moderately sorted material; commonly strewn with a boulder lag. Thickness ranges from 1–10 m.

Mt — **Terraced marine sediments:** silts, clays, and fine sands deposited primarily offshore that have been eroded and/or terraced by glaciofluvial, and/or fluvial processes and modified by eolian processes; form plains commonly with deflation surfaces devoid of vegetation adjacent to alluvial or glaciofluvial plains; surfaces commonly marked with channel scars and contain patches of fluvial and/or eolian sands.

M — **Sediments undifferentiated:** comprised of alluvial sediments that cannot be differentiated or defined by deposit type.

GLACIOMARINE DEPOSITS: Sediments deposited in a glaciomarine environment within a high proglacial sea adjacent to the ice margin; deposited primarily from suspension, submarine gravity flows and minor debris flows; also includes sediments that accumulate in the littoral zone. Ice-rafted debris and iceberg scours may be present.

GMd — **Deltaic sediments:** cross-stratified sands and rounded gravels associated with glaciofluvial deposition into a glaciomarine environment; form a low-relief mantle that may have a depositional scarp or face along the delta front present.

GM — **Glaciomarine undifferentiated:** comprised of alluvial sediments that cannot be differentiated or defined by deposit type.

GLACIOLACUSTRINE DEPOSITS: Massive to stratified sand and silt deposited in lakes dammed by glacial ice. Distally deposited glaciolacustrine sediments (silt and clay) typically underlie plains or gently rolling terrain. Proximally deposited glaciolacustrine sediments (sand and silt) may underlie ridged, hummocky, or pitted terrain caused by subsequent meltout of stagnant ice.

GLb — **Blanket sediments:** well stratified silt and sand. Local relief is less than 1 m (plain) and sediments masks the underlying topography. Thickness ranges from 2 m to >20 m.

GLd — **Deltaic sediments:** moderately- to well-sorted, cross-stratified sand and rounded gravels associated with glaciofluvial deposition into a glaciolacustrine environment. Generally form a low relief mantle or fan-shaped plain that may have formed a depositional a scarp or face along the delta front.

GL — **Glaciolacustrine undifferentiated:** comprised of alluvial sediments that cannot be differentiated or defined by deposit type.

GLACIOFLUVIAL DEPOSITS: Well stratified to massive sand, gravel with minor silt deposited by streams flowing away from, or in contact with glacial ice in either a sub-aerial or subaqueous environment. Deposits may include diamictons. These sediments can range from well to poorly sorted. Patches of felsenmeer may be present locally.

GFv — **Sediment veneer:** stratified to massive gravel, sand, and silt. May occur in patches or as gravel lag over rock; thickness is typically less than 2 m.

GFp — **Outwash plain sediments:** moderately- to well-sorted, cross-stratified sand and rounded gravels ranging 2–20 m thick. Form low-relief plain commonly with kettles and/or channel scars on the surface; deposited in a proglacial, sub-aerial environment that may grade into deltaic sediments near marine limit.

GFt — **Terraced outwash plain sediments:** moderately- to well-sorted, cross-stratified sand and rounded gravels typically elevated above a lower-level glaciofluvial or fluvial deposit due to down-cutting to produce erosional scarps and/or an incised plain.

GFh — **Hummocky ice-contact sediments:** primarily composed of massive to stratified, poorly sorted sand and gravel from 5 m to ≥15 m thick; deposited by meltwater in direct contact with the glacial ice either at its margin, within and/or beneath the ice mainly within meltwater corridors. Strata are commonly deformed due to syndepositional collapse from the melting of supporting ice. Forms complex arrangement of slopes extending from rounded depressions, to irregular conical mounds; includes esker ridges and aprons, disintegration ridges and crevasse fills.

GFf — **Proximal fan sediments:** moderately- to well-sorted, cross-stratified sand and rounded gravels forms low-relief fan at the ice margin of an englacial or subglacial meltwater channel in a subaerial and/or subaqueous environment.

GF — **Glaciofluvial undifferentiated:** comprised of alluvial sediments that cannot be differentiated or defined by deposit type.

GLACIAL DEPOSITS: Diamicton with poorly sorted silty-sand to sandy-silt matrix deposited directly by glacial ice or by sediment gravity flow. Lithic composition generally reflects local bedrock type. Scattered patches of felsenmeer are common.

Tv — **Till veneer:** till; less than 2 m thick; occurs in patches over rock and is interspersed with rock outcrop; deposits are thin enough to reveal details of underlying rock structure. Deposited mainly in a subglacial environment.

Tb — **Till blanket:** till; forms a continuous cover that generally masks underlying bedrock topography. May comprise streamlined forms such as drumlins, flutes, and crag-and-tails. Some areas have large frost polygons, non-sorted and sorted circles and/or solifluction lines. Thickness is generally from 2 m to >20 m. Deposited mainly in a subglacial environment.

Tr — **Ridged moraine:** comprised of till and glaciofluvial sediments. Forms discrete end and recessional moraine ridges oriented transverse to paleo-ice flow direction(s).

Th — **Hummocky till:** stratified to massive diamicton (till) and interstratified glaciofluvial gravel and sand. Stratification often exhibits syndepositional deformation features caused by slumping or ice meltout. May contain variable amounts of ice-walled glaciofluvial and glaciolacustrine sediments. Forms hummocky surface (i.e. kame and kettle topography); in places the unit may exhibit prominent ridges marking major recessional ice margins, or diffuse zones marking boundaries between glacial-ice regimes. Deposition related to melting of stagnant ice.

T — **Till undifferentiated:** comprised of alluvial sediments that cannot be differentiated or defined by deposit type.

U — **Undifferentiated sediments:** interspersed pockets of alluvial, colluvial, lacustrine, glaciolacustrine, glaciomarine, marine, glaciofluvial sediments, and till that are too small to be represented as separate units at this scale of mapping. Locally includes scattered bedrock outcrops.

PRE-QUATERNARY

BEDROCK: Archean to Paleoproterozoic; primarily metamorphosed granitic to intermediate gneisses and minor supracrustal rocks. Curving, multi-generational folds and faults form prominent topographic features.

R — **Bedrock undifferentiated:** intact and frost-riven outcrop of various lithologies. Variously modified by glacial erosion (i.e. roches moutonnées) and more rarely, sculpted by glaciofluvial processes (P-forms); flat to hilly topography; surfaces range from rough and weathered to glacially polished and striated. Felsenmeer commonly ring low-relief outcrops. Locally includes patches of till, glaciofluvial, glaciomarine, marine, glaciolacustrine, lacustrine, and/or alluvial sediments. Where this unit is combined with the felsenmeer overlay, the bedrock occurs predominantly as felsenmeer.

NOTES: **Compound units:** in both cases of using multiple map-unit designators, the first or the overlying designator is the dominant surficial material and determines the map-unit colour.
Complex designator: where the surficial cover forms a complex pattern and the map units are too small to be mapped individually, yet constitute a significant aerial extent of the total polygon, the map units may be designated in combination where a dot (".") is used to separate the map unit designators. For example, "Tv.R" designates an area of till veneer with numerous outcrops of bedrock.
Stratigraphic sequence: where materials of different origin or texture are known to be superimposed, or can be reasonably confidentially inferred, the sequence is indicated in conventional order using a slash. For example, "Mv/Tb" indicates a marine veneer overlying a till blanket.

Felsenmeer: in-situ angular to sub-angular blocks of rock derived from the underlying bedrock by intensive frost action; form patches of continuous cover on a flat to gently sloping area. Commonly form rings around low-relief outcrops.

Gullied sediments: unvegetated sediments with an extensive gully network on a scale too large to identify discrete gullies. Arêtes, table tops, and hoodoos due to gullying and related erosional processes are common.

- Geological contact (defined)
- Slope movement direction (debris flow, landslide)
- Landslide escarpment
- Marine terrace scarp
- Beach (raised beach shoreline)
- Limit of marine/glaciomarine submergence
- Glaciofluvial or fluvial terrace scarp
- Minor meltwater channel, sense unknown
- Minor meltwater channel, sense known
- Major meltwater channel or corridor margin
- Kettle
- Minor moraine ridge (recessional)
- Major moraine ridge (end, unspecified)
- Esker, sense unknown
- Esker, sense known
- Crevasse filling ridge
- Glacial fluting
- Drumlinoid ridge, sense unknown
- Drumlinoid ridge, sense known
- Crag-and-tail
- Striation (ice-flow direction unknown, well defined)
- Striation, direction known, well defined, numbers indicate relative age (1 - oldest) (*see* attribute table (Rel_age field) for relative ages)
- Striation (ice-flow direction unknown, poorly defined)
- Striation, direction known, poorly defined, numbers indicate relative age (1 - oldest) (*see* attribute table (Rel_age field) for relative ages)
- Outcrop
- Roche moutonnée
- Field observation without sample (McMartin et al., 2003b)
- Field observation and sample site (McMartin et al., 2003b)
- 02EL501 Terrestrial cosmogenic nuclide age and sample ID (*see* Table 1 on CGM 62)

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Canadian Geoscience Maps

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Geology based on air photo interpretation and field work by D.J. Utting, E.C. Little, T. Ferbey, C. Ozyer, and M. Giangioppi, 2002, as part of the Committee Bay Multidisciplinary Geoscience TGI-1 Project; limited field checks by J.E. Campbell and I. McMartin, 2010, as part of GEM Wager Bay Surficial Mapping Activity.

Geological compilation by J.E. Campbell, 2010

Geomatics by L. Robertson, 2011

Cartography by D. Viner

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Logistical support provided by the Polar Continental Shelf Program as part of its mandate to promote scientific research in the Canadian North

Map projection Univeral Transverse Mercator, zone 16.
North American Datum 1983

CANADIAN GEOSCIENCE MAP 62
SURFICIAL GEOLOGY
ATORQUAIT RIVER
Nunavut
1:50 000

1 0 1 2 3 4 km

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

Shaded relief image derived from the digital elevation model supplied by the Geological Survey of Canada. Illumination: azimuth 315°, altitude 45°, vertical factor 5x

Proximity to the North Magnetic Pole causes the magnetic compass to be erratic in this area.
Magnetic declination 2013, 17°31' W decreasing 12.4' annually.

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

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Preliminary publications in this series have not been scientifically edited.

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