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GEOLOGICAL SURVEY OF CANADA

CANADIAN GEOSCIENCE MAP 252

BRITISH COLUMBIA GEOLOGICAL SURVEY

GEOSCIENCE MAP 2016-1

SURFICIAL GEOLOGY

MOFFAT CREEK AREA

British Columbia

Parts of NTS 93-A/3, NTS 93-A/4, NTS 93-A/5, and NTS 93-A/6

Map Information Document

Preliminary

Geological Survey of Canada
Canadian Geoscience Maps

2016

Canada

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Natural Resources Canada, Geological Survey of Canada
Canadian Geoscience Map 252 (Preliminary); British Columbia Geological Survey, Geoscience Map 2016-1

Title

Surficial geology, Moffat Creek area, British Columbia, parts of NTS 93-A/3, NTS 93-A/4, NTS 93-A/5, and NTS 93-A/6

Scale

1:50 000

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ABSTRACT

The Moffat creek area includes the Woodjam porphyry Cu-Au-Mo developed prospect. Between Moffat and Woodjam creeks, this prospect consists of six mineralized zones: Megabuck, Deerhorn, Spellbound, Southeast, Takom, and Three Firs. Till deposited during the Late Wisconsinan Fraser Glaciation is the predominant glacial sediment in the area. Landform-scale ice-flow indicators such as drumlins and crag-and-tail ridges, and outcrop-scale features such as striations, demonstrate that ice initially flowed south-southwest and later flowed north-northwest. Hummocky topography and eskers suggest

that deglaciation was, at least in part, via downwasting of stagnant ice masses. Important accumulations of glaciofluvial sand and gravel deposits in the Horsefly River valley, and in lower volumes in the southwest part of the study area, represent sources of construction aggregate. Retreat-phase glaciolacustrine sediments were deposited in the Horsefly area and Beaver Creek valley at elevations of up to 800 m above sea level. These deposits could be contemporaneous with, and related to, higher water levels in the Fraser or Quesnel river systems during deglaciation and the formation of glacial Lake Fraser. Alternatively, they could be related to local damming of the Beaver Creek and Horsefly River drainages.

RÉSUMÉ

La région du ruisseau Moffat comprend le prospect mis en valeur de Woodjam qui est un gîte porphyrique de cuivre, or et molybdène. Ce prospect compte six zones minéralisées situées entre les ruisseaux Moffat et Woodjam : Megabuck, Deerhorn, Spellbound, Southeast, Takom et Three Firs. Le till mis en place pendant la Glaciation de Fraser du Wisconsinien supérieur est le sédiment glaciaire prédominant de cette région. Les indicateurs d'écoulement glaciaire à l'échelle des formes de terrain, tels que les drumlins et les structures en crag-and-tail, ainsi que ceux à l'échelle des affleurements rocheux, tels que les stries glaciaires, indiquent que le mouvement des glaces a tout d'abord été dirigé vers le sud–sud-ouest et subséquemment vers le nord–nord-ouest. Les formes de terrain bosselées et les eskers donnent à penser que la déglaciation s'est effectuée en partie par un amaigrissement sur place de masses de glace stagnantes. D'importants dépôts de sable et gravier fluvioglaciaires dans la vallée de la rivière Horsefly et en moindre quantité dans le sud-ouest de la région à l'étude constituent des ressources en granulats. Dans la région de Horsefly et la vallée du ruisseau Beaver, des sédiments glaciolacustres ont été déposés pendant le retrait glaciaire jusqu'à une altitude de 800 m au-dessus du niveau de la mer. Ces dépôts glaciolacustres pourraient être contemporains et une conséquence des hauts niveaux d'eau dans les bassins versants du fleuve Fraser et de la rivière Quesnel lors de la déglaciation et de la formation du Lac glaciaire Fraser. Selon une autre hypothèse, ils pourraient être reliés au barrage local des eaux du ruisseau Beaver et de la rivière Horsefly.

ABOUT THE MAP

General Information

Author: T. Ferbey, V.M. Levson, and A. Plouffe

Geology by T. Ferbey, V.M. Levson, and A. Plouffe (2011–2013)

Geology conforms to Surficial Data Model v. 2.1

Preparation of this map was completed with the field notes of V.M. Levson collected for Gold Fields Exploration Inc. in the region of the Woodjam prospect (south of Starlike Lake).

Geomatics by L. Robertson

Cartography by D. Viner

Joint initiative of the Geological Survey of Canada and the British Columbia Geological Survey, conducted under the auspices of the Intrusion-Related Ore System project as part of Natural Resources Canada's Targeted Geoscience Initiative-4 program

Map projection Universal Transverse Mercator, zone 10.
North American Datum 1983

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

Shaded relief image derived from the digital elevation model supplied by Natural Resources Canada. Illumination: azimuth 315°, altitude 45°, vertical factor 1x

Magnetic declination 2016, 17°02'E, decreasing 10.9' annually.

This map is not to be used for navigational purposes.

Title photograph: Two sets of striations and grooves on a Chilcotin Group basalt outcrop located 7 km southwest of Bells Lake. One set is oriented 150–330° (parallel to smaller marker) and a second set is oriented 132–312° (parallel to larger marker). An age relationship between these sets could not be determined at this site. Markers are 14 cm long. Photograph by T. Ferbey. 2015-097

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.nrcan.gc.ca/).

Preliminary publications in this series have not been scientifically edited.

Map Viewing Files

The published map is distributed as a Portable Document File (PDF), and may contain a subset of the overall geological data for legibility reasons at the publication scale.

ABOUT THE GEOLOGY

References

Hashmi, S., Plouffe, A., and Ward, B.C., 2015. Surficial geology, Bootjack Mountain area, British Columbia, Parts of NTS 93-A/5, NTS 93-A/6, NTS 93-A/11 and NTS 93-A/12; Geological Survey of Canada, Canadian Geoscience Map 209 (preliminary),

British Columbia Geological Survey, Geoscience Map 2015-02, scale 1:50 000. doi:10.4095/296029

Plouffe, A. and Ferbey, T., 2015. Surficial geology, Granite Mountain area, British Columbia, parts of NTS 93-B/8 and NTS 93-B/9; Geological Survey of Canada, Canadian Geoscience Map 223 (preliminary), British Columbia Geological Survey, Geoscience Map 2015-4, scale 1:50 000. doi:10.4095/296793

Author Contact

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Coordinate System

Projection: Universal Transverse Mercator
Units: metres
Zone: 10
Horizontal Datum: NAD83
Vertical Datum: mean sea level

Bounding Coordinates

Western longitude: 121°40’00”W
Eastern longitude: 121°10’00”W
Northern latitude: 52°25’00”N
Southern latitude: 52°10’00”N

Surficial Data Model Information

The Geological Survey of Canada (GSC) through the Geomapping for Energy and Minerals Program (GEM) has undertaken the Geological Map Flow to develop protocols for the collection, management (compilation, interpretation), and dissemination of surficial and bedrock geology data and map information. To this end, a data model has been created.

The Surficial Data Model (SDM) was designed using ESRI geodatabase architecture. The XML workspace document provided can be imported into a geodatabase, and the geodatabase will then be populated with the feature datasets, feature classes, tables, relationship classes, subtypes and domains.

Shapefile and table (.dbf) versions of the data are included within the data. Column names have been simplified and the text values have been maintained within the shapefile attributes. The direction columns are numerical, to display rotation for points,

and the symbol fields will hold the correct values to be matched to the appropriate style file.

For a more in depth description of the data model please refer to the official publication:

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., St-Onge, D.A., and Weatherston, A., 2015. Surficial Data Model, version 2.1.0: Revisions to the science language of the integrated Geological Survey of Canada data model for surficial geology maps; Geological Survey of Canada, Open File 7741, 276 p. doi:10.4095/296568

LICENCE AGREEMENT

ACCORD DE LICENCE

References

Hashmi, S., Plouffe, A., and Ward, B.C., 2015. Surficial geology, Bootjack Mountain area, British Columbia, Parts of NTS 93-A/5, NTS 93-A/6, NTS 93-A/11 and NTS 93-A/12; Geological Survey of Canada, Canadian Geoscience Map 209 (preliminary); British Columbia Geological Survey, Geoscience Map 2015-02, scale 1:50 000. doi:10.4095/296029

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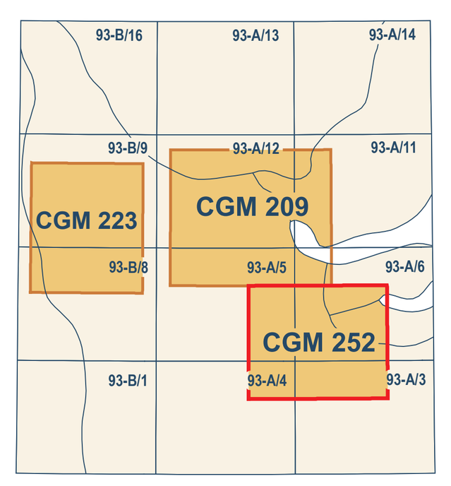

National Topographic System reference and index to adjoining published Geological Survey of Canada maps

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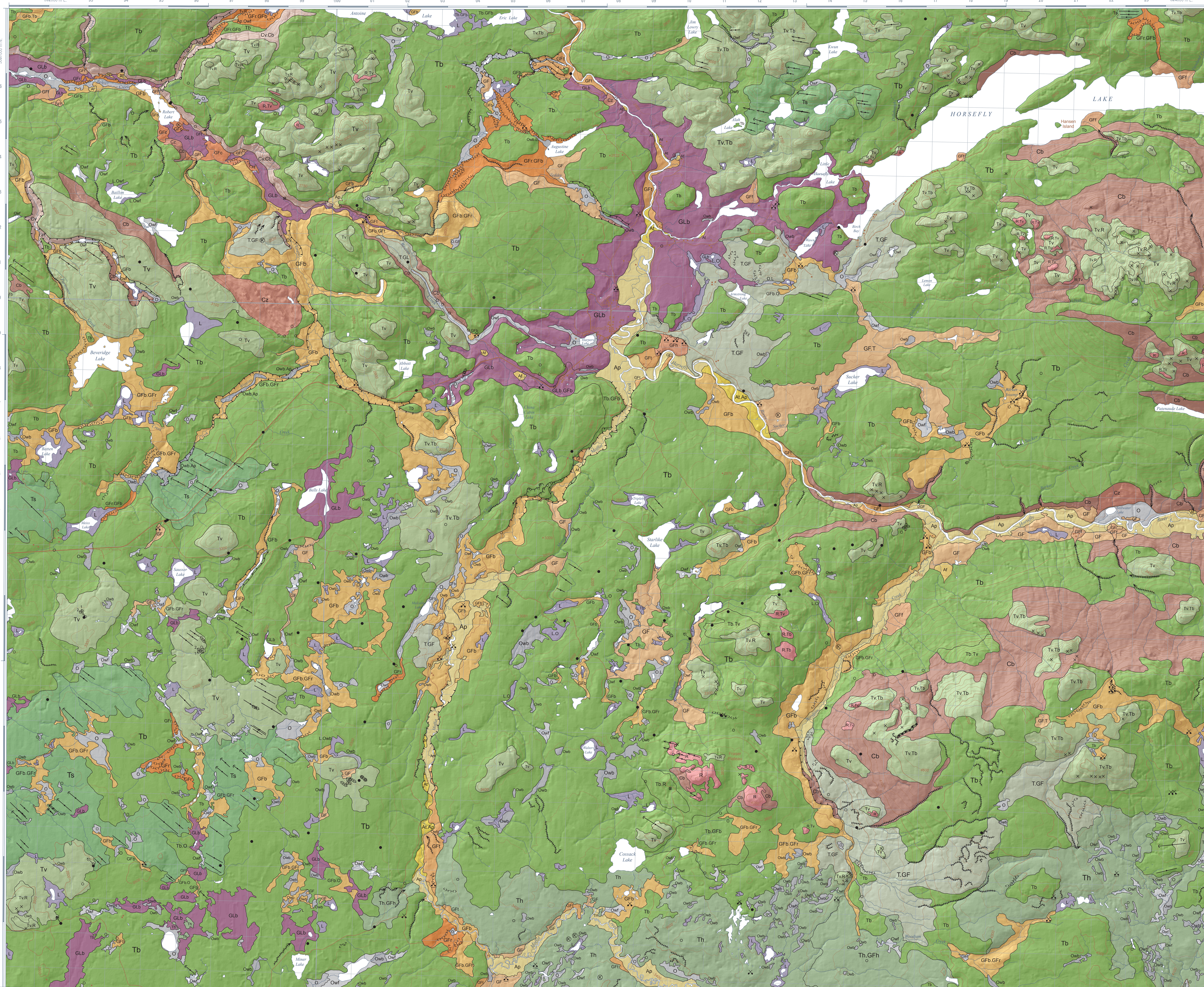

QUATERNARY

POST LAST GLACIATION

NONGLACIAL ENVIRONMENT

ORGANIC DEPOSITS: peat and plant material in various stages of decomposition; 1 to 3 m thick on average; peat derived from decayed plant material in an eutrophic environment; generally occur as flat, wet terrain (swamps) over poorly drained substrates; form relatively open peatlands; may include minor fluvial and lacustrine sediments.

Owf — **Fen peat:** peat derived from sedges and partially decayed shrubs; forms relatively open peatlands with a mineral-rich water table that persists seasonally near the surface; can be covered with low shrubs and sparse trees.

Owb — **Bog peat:** sphagnum or forest peat; may be treed or treeless.

O — **Undifferentiated organic deposits:** undifferentiated bog and fen peat.

COLLUVIAL AND MASS WASTING DEPOSITS: diamicton and rubble; poorly sorted, massive to stratified debris deposited by direct, gravity-induced movement; composition varies with source material.

Cz — **Landslide deposits:** diamicton, generally 1 to 10 m thick, but may exceed 10 m near the toe of large landslides; hummocky topography; includes inactive and potentially active landslides.

Cv — **Colluvial veneer:** thin and discontinuous cover of slumped material; 1 to 2 m thick on average; dominantly overlies bedrock or till; occurs on moderate to steep slopes.

Cb — **Colluvial blanket:** continuous cover of slumped material; more than 2 m thick on average; dominantly overlies bedrock or till; occurs on moderate to steep slopes.

ALLUVIAL SEDIMENTS: sorted gravel, sand, minor silt and organic detritus deposited by modern streams; commonly stratified.

Ap — **Alluvial floodplain sediments:** sorted sand and silt with lesser amounts of pebbly gravel and organic detritus; more than 1 m thick; forming active floodplains close to river level with meander channels and scroll marks; prone to flooding.

Af — **Alluvial fan sediments:** poorly sorted gravel, sand and diamicton; more than 2 m thick; occur where a stream issues from a narrow gulley or valley onto a plain or valley floor.

At — **Alluvial terrace sediments:** sorted gravel, sand and minor silt; more than 2 m thick; forming inactive terraces above modern floodplain; represents a potential aggregate source.

L — **LACUSTRINE SEDIMENTS:** sand, silt, and minor clay, massive to laminated, intermixed with variable amount of organic material, deposited in a lake; more than 1 m thick; exposed following lowering of lake levels; includes organic deposits too small to be mapped separately.

GLACIAL AND LATE-GLACIAL

PROGLACIAL AND GLACIAL ENVIRONMENTS

GLACIOLACUSTRINE SEDIMENTS: fine sand, silt, and clay, with minor debris-flow diamicton and gravel; laminated, bedded and massive; deposited in glacier-dammed lakes in valleys and along the margin of retreating glaciers.

GLb — **Glaciolacustrine blanket:** fine sand, silt, and clay; dominantly laminated and bedded; more than 2 m thick on average; forms a continuous cover.

GLACIOFLUVIAL SEDIMENTS: sand and gravel with minor diamicton; well to poorly stratified; deposited behind, at, or in front of the ice margin by glacial meltwater; represent a potential granular aggregate source.

GFt — **Glaciofluvial terrace sediments:** sand and gravel; 1 to 10 m thick; forming gently sloping flat surfaces perched above modern streams, meltwater channels or alluvial deposits.

GFf — **Outwash fan sediments sediments:** poorly-sorted sand and gravel; bedded; 1 to more than 10 m thick; deposited by meltwater at various positions in front of the retreating glaciers; generally forms a fan-shaped surface sloping away from the retreating glacier or meltwater source.

GFh — **Hummocky glaciofluvial sediments:** poorly-sorted sand and gravel with minor diamicton; bedded to massive; individual beds can be deformed; 1 to more than 20 m thick; deposited during ice-retreat; forms hummocky topography that is related to melting of ice.

GFc — **Ice-contact glaciofluvial sediments:** poorly sorted coarse sand and gravel deposits with pockets of diamict and fine sand and silt lenses; greater than 1 m and up to 10 m thick; landforms include kame terraces, kettle and kame topography, small eskers, deltas and ablation till forming an irregular topography.

GFr — **Esker sediments:** sand and gravel; massive to bedded; 3 to more than 5 m thick; forming ridges deposited by meltwater flow within tunnels, channels, or openings in glacier ice.

GFb — **Glaciofluvial blanket:** sand and gravel; more than 2 m thick; occurs within and near the margins and mouths of channels and valleys that carried meltwater; forms gently undulating to flat surfaces.

GF — **Undifferentiated glaciofluvial sediments:** undivided glaciofluvial sand and gravel deposits; more than 2 m thick.

TILL: matrix-supported diamicton consisting of pebbles, cobbles and boulders in a sandy to silty-sand matrix; deposited directly by glaciers; clasts are of various lithologies and many are striated and faceted.

Th — **Hummocky till:** more than 2 m thick on average; hummocky to rolling surface including discontinuous lenses of glaciofluvial gravel.

Ts — **Streamlined and fluted till:** more than 2 m thick on average; till surface marked by streamlined landforms including flutings, drumlins, and crag-and-tails; rare bedrock outcrops can be present at the head, or up-ice end, of crag-and-tails.

Tv — **Till veneer:** 1 to 2 m thick on average; discontinuous till cover; underlying bedrock morphology is discernible; bedrock outcrops are abundant.

Tb — **Till blanket:** more than 2 m thick on average; continuous till cover forming undulating topography that locally obscures underlying units; rare bedrock outcrops.

T — **Undifferentiated till:** undivided continuous till cover; more than 2 m thick on average; rare bedrock outcrops.

PRE-QUATERNARY

BEDROCK: volcanic, intrusive, sedimentary, and lesser amount of metamorphic bedrock of Mesozoic to Cenozoic age.

R — **Bedrock:** can include discontinuous areas of overlying till or colluvium that rarely exceed 1 m thickness.

Complex units: complex unit labels are used in areas where the map units are too small to be mapped individually. For example, T.GF designates a region of till with lesser amount of glaciofluvial sediments.

- Geological contact, defined
- Landslide escarpment
- Terrace scarp
- Minor meltwater channel (paleocurrent direction unknown)
- Minor meltwater channel (paleocurrent direction known)
- Major meltwater channel
- Esker (paleocurrent direction unknown)
- Drumlinoid ridge
- Drumlin
- Crag-and-tail
- Roche moutonnée
- Bedrock scarp
- Kettle
- Striations, poorly defined (paleo ice-flow direction unknown)
- Striations (paleo ice-flow direction unknown)
- Striations (paleo ice-flow direction known)
- Cross striations (1 = oldest; shown where relative age could be established)
- Small outcrop
- Gravel pit, inactive
- Gravel pit, active
- Field station without sample
- Field station with sample

Recommended citation
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1 0 1 2 3 4 km

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