

NATURAL RESOURCES CANADA
GEOLOGICAL SURVEY OF CANADA
CANADIAN GEOSCIENCE MAP 441
SURFICIAL GEOLOGY
AMARUQ DEPOSIT AREA
Kivalliq Region, Nunavut
NTS 66-H southeast



**Map Information
Document**

**Geological Survey of Canada
Canadian Geoscience Maps**

2022

Canada 



MAP NUMBER

Natural Resources Canada, Geological Survey of Canada
Canadian Geoscience Map 441

TITLE

Surficial geology, Amaruq Deposit Area, Kivalliq Region, Nunavut, NTS 66-H southeast

SCALE

1:50 000

CATALOGUE INFORMATION

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ABSTRACT

The Amaruq deposit map area is a glacial landscape dominated by till deposits (72% of map area) forming transverse ridges, hummocky moraine, or plains of varying thickness, occasionally streamlined. Glacial lake sediments cover about 18% of the map area and form thick to thin deposits covering the till. They occur predominantly in lowlands and below approximately 140 m a.s.l., which is the elevation of the highest raised beaches located in the western part of the map area. Some of the glacial lake sediments could have been deposited in a marine environment during high sea levels following deglaciation. Sand and gravel deposits occur in subglacial meltwater corridors forming terraces, esker ridges, and small hummocks, or in proglacial outwash plains. The effects of meltwater at the base of the glacier or by currents and waves in proglacial lake and/or marine basins have resulted in winnowing of fine particles, reworking of sediments, and surface boulder concentrations. Streamlined till landforms and striations indicate that ice flow was dominantly to the north-northwest. This predominant flow was locally succeeded by northwest and west-northwest ice flows as indicated by crosscutting striations. A late deglacial ice-flow direction converging towards a major esker tunnel is observed east of the Amaruq deposit.

RÉSUMÉ

La région cartographique du gisement d'Amaruq présente un paysage glaciaire dominé par des dépôts de till (72% de la surface de la carte) formant des crêtes transversales, des moraines bosselées ou des plaines de till d'épaisseur variable, parfois profilées. Des sédiments glaciolacustres couvrent environ 18 % de la surface de la carte et forment des dépôts épais à minces couvrant le till. Ils sont localisés principalement dans les terrains bas et en dessous d'environ 140 m ASL, qui est l'élévation des plages les plus élevées situées dans la partie ouest de la carte. Certains des sédiments glaciolacustres ont pu être déposés dans un environnement marin pendant les niveaux élevés de la mer après la déglaciation. Des dépôts de sable et de gravier se trouvent dans les corridors sous-glaciaires d'eau de fonte formant des terrasses, des crêtes d'esker et de petits monticules, ou dans les plaines d'épandage proglaciaires. Les effets exercés par l'eau de fonte à la base du glacier ou par les courants et les vagues dans les lacs proglaciaires ou les bassins marins ont abouti au lessivage des particules fines, au remaniement des sédiments et à la concentration de blocs en surface. Les reliefs profilés et les stries indiquent que la glace s'écoulait principalement vers le nord-nord-ouest. Cet écoulement prédominant a été suivi localement par des écoulements vers le nord-ouest et l'ouest-nord-ouest, comme l'indiquent les recoupements de stries. Une direction d'écoulement de la fin de la déglaciation convergeant vers un tunnel d'esker majeur est relevée à l'est du gisement d'Amaruq.

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SHEET 1 OF 1, SURFICIAL GEOLOGY

GENERAL INFORMATION

Authors: N. Boulianne-Verschelden, V. De Bronac de Vazelhes, I. McMartin, and G. Beaudoin

Geology based on the interpretation of satellite imagery and aerial photography by N. Boulianne-Verschelden and field work in 2016 by N. Boulianne-Verschelden and V. De Bronac de Vazelhes. Modified from preliminary map of R.D. Thomas (1979)

Geological compilation by N. Boulianne-Verschelden, 2018 and 2019

Geology conforms to Surficial Data Model v. 2.4.0 (Deblonde et al., 2019).

Detailed methods and description of units provided in GSC Open File 8651 (Boulianne-Verschelden et al., 2019)

Mapping completed as part of MSc thesis work under the co-supervision of Dr. Isabelle McMartin and Prof. Georges Beaudoin within the NSERC—Agnico Eagle Industrial Research Chair in Mineral Exploration at Université Laval.

Geomatics by L. Robertson

Cartography by N. Côté

Scientific editing by L. Ewert

Initiative of the Geological Survey of Canada, conducted under the auspices of the GEM-2 Rae Province, Synthesis of Glacial History as part 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

Shaded-relief image derived from the digital elevation model supplied by Geospatial Data Extraction CDED

Illumination: azimuth 315°, altitude 45°, vertical factor 1x

Magnetic declination 2022, 1°31'W, decreasing 10' annually

This map is not to be used for navigational purposes.

Title photograph: Amaruq exploration camp in July 2016 with thin reworked till in front and predominantly thicker till in the background. Photograph by I. McMartin. NRCan photo 2020-427

The Geological Survey of Canada welcomes corrections or additional information from users (gscpublications-cgcpublishments@nrcan-rncan.gc.ca).

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

This publication is available for free download through GEOSCAN (<https://geoscan.nrcan.gc.ca/>).

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.

DEFINITION QUERIES USED ON MAP

This map utilizes definition queries in order to customize the display for visualization on the PDF of the map only and does not affect the digital data. The following features have a definition query applied:

- Station location (ground observation or stratigraphic section)

ACKNOWLEDGMENTS

This project would not have been possible without the technical and logistical support of the Amaruq exploration team of Agnico Eagle Mines Limited, in particular Olivier Côté-Mantha and Marjorie Simard. The conversion of the preliminary regional map was made under Natural Resources Canada's Geomapping for Energy and Minerals (GEM) program. This project was carried out with the financial participation of Agnico Eagle Mines Limited, the Quebec Ministry of Energy and Natural Resources, and the Natural Sciences and Engineering Research Council of Canada. The manuscript benefited from a scientific review by Dan Kerr of the Geological Survey of Canada.

REFERENCES

Boulianne-Verschelden, N., De Bronac de Vazelhes, V., McMartin, I., and Beaudoin, G., 2019. Cartographie du Quaternaire dans la région du gisement Amaruq, Nunavut; Commission géologique du Canada, Open File 8651, 1 .zip file.
<https://doi.org/10.4095/315667>

Deblonde, C., Cocking, R.B., Kerr, D.E., Campbell, J.E., Eagles, S., Everett, D., Huntley, D.H., Inglis, E., Parent, M., Plouffe, A., Robertson, L., Smith, I.R., and Weatherston, A., 2019. Surficial Data Model: the science language of the integrated Geological Survey of Canada data model for surficial geology maps; Geological Survey of Canada, Open File 8236, ver. 2.4.0, 1 .zip file.
<https://doi.org/10.4095/315021>

Thomas, R.D., 1979. Surficial geology, Amer Lake (66H); *in* Surficial geology and geomorphology of north-central Keewatin, Geological Survey of Canada, Open File 626, scale 1:125 000. <https://doi.org/10.4095/129533>

SUGGESTED READINGS

De Bronac De Vazelhes, V., 2019. Étude de la dispersion d'un gisement d'or dans les sédiments glaciaires : Le cas d'Amaruq (Nunavut, Canada); Mémoire de maîtrise, Université Laval, 191 p. <http://hdl.handle.net/20.500.11794/37057>

AUTHOR CONTACT

Questions, suggestions, and comments regarding the geological information contained in the data sets should be addressed to:

I. McMartin
Geological Survey of Canada
601 Booth Street
Ottawa ON
K1A 0E8
isabelle.mcmartin@NRCan-RNCan.gc.ca

COORDINATE SYSTEM

Projection: Universal Transverse Mercator
Units: metres
Zone: 14
Horizontal Datum: NAD83
Vertical Datum: mean sea level

BOUNDING COORDINATES

Western longitude: 97°15'00"W
Eastern longitude: 96°00'00"W
Northern latitude: 65°30'00"N
Southern latitude: 65°10'00"N

SOFTWARE VERSION

Data has been originally compiled and formatted for use with ArcGIS™ desktop version 10.7.1 developed by ESRI®.

DATA MODEL INFORMATION

Surficial

The Geological Survey of Canada (GSC) through the Geo-mapping 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:

Deblonde, C., Cocking, R.B., Kerr, D.E., Campbell, J.E., Eagles, S., Everett, D., Huntley, D.H., Inglis, E., Parent, M., Plouffe, A., Robertson, L., Smith, I.R., and Weatherston, A., 2019. Surficial Data Model: the science language of the integrated Geological Survey of Canada data model for surficial geology maps; Geological Survey of Canada, Open File 8236, ver. 2.4.0, 1 .zip file.
<https://doi.org/10.4095/315021>