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GEOLOGICAL SURVEY OF CANADA

CANADIAN GEOSCIENCE MAP 223

BRITISH COLUMBIA GEOLOGICAL SURVEY

GEOSCIENCE MAP 2015-4

SURFICIAL GEOLOGY

GRANITE MOUNTAIN AREA

British Columbia

Parts of NTS 93-B/8 and NTS 93-B/9

Map Information Document

Preliminary

Geological Survey of Canada
Canadian Geoscience Maps

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Scale

1:50 000

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ABSTRACT

The Granite Mountain area, located in south central British Columbia, includes the Gibraltar Mine (porphyry Cu-Mo deposit). Most of the map area is underlain by till of the Late Wisconsinan Fraser Glaciation. During deglaciation, meltwater channels were eroded in the hillsides of Granite Mountain and the mountainous ridge north of the mine indicating that ground at high elevation was deglaciated first. Meltwater was generally

routed to the north through two dominant corridors: one in the west, in the region trending north from Cuisson Lake and a second one in the east, in the valleys of Ben and Skelton lakes and Arbuthnot Creek. Glaciofluvial sediments deposited during ice retreat represent potential granular resources. A glacial lake and associated delta are mapped north of Ben Lake from aerial photograph interpretation. At the western edge of the map area, large landslides most likely in bedrock and unconsolidated sediments occurred along the bedrock escarpment of the Fraser River valley. Anthropogenic deposits including wet and dry tailings surround Gibraltar Mine.

RÉSUMÉ

La mine Gibraltar (gîte porphyrique Cu-Mo) est située dans la région de la montagne Granite, sise dans la partie centrale sud de la Colombie-Britannique. Cette région est principalement recouverte de till mis en place pendant la glaciation de Fraser du Wisconsinien tardif. Pendant la déglaciation, des chenaux d'eau de fonte ont été érodés sur les versants de la montagne Granite et de la crête montagneuse au nord de la mine indiquant que les régions à plus haute altitude ont été les premières déglacées. L'eau de fonte s'est principalement écoulée vers le nord à l'intérieur de deux corridors : l'un à l'ouest, s'étendant au nord du lac Cuisson et un second à l'est, occupant les vallées des lacs Ben et Skelton ainsi que la vallée du ruisseau Arbuthnot. Les sédiments fluvioglaciaires mis en place pendant le retrait glaciaire représentent des ressources granulaires potentielles. Au nord du lac Ben, des sédiments glaciolacustres et un delta sont cartographiés basés sur l'interprétation des photos aériennes. De grands glissements de terrain sont présents le long de la limite occidentale de la région d'étude. Ces glissements se sont probablement produits dans la roche en place et dans des sédiments non consolidés le long des escarpements rocheux dans la vallée du fleuve Fraser. Des dépôts anthropiques incluant des résidus miniers secs et humides sont présents aux environs de la mine Gibraltar.

ABOUT THE MAP

General Information

Authors: A. Plouffe and T. Ferbey

Geology by A. Plouffe and T. Ferbey (2011, 2012, 2013)

Geology conforms to Surficial Data Model v. 2.0.2

Geomatics by L. Robertson

Cartography by G.S. Hanna

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 2015, 17°25'E, decreasing 11.2' annually.

This map is not to be used for navigational purposes.

Title photograph: Looking northwest at a roche moutonnée trending 315°. The person is 1.7 m tall. The roche moutonnée is located approximately 500 m to the southeast of Gibraltar Mine tailing pond visible in the background.
Photograph by A. Plouffe. 2012-009

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

Descriptive Notes

Three ice movements have been identified in this region. Striations and rat tails on an outcrop located approximately 400 m east of Cuisson Lake reveal a movement to the south-southeast. This ice movement might have occurred at the onset of the glaciation when glaciers first formed locally, north of the mine, over the unnamed mountain ridge marked with cirques and arêtes. An ice movement to the west to southwest is indicated

from a few striations throughout the map area and flutings approximately 2 km east of the mine. This ice movement occurred when glaciers derived from the Cariboo Mountains (east of the map area) advanced over the area. Lastly, striations and macro-landforms (drumlins, flutings, crag-and-tails) indicate an ice movement to the north to northwest. This movement occurred at glacial maximum, when an ice-divide formed around the 52° latitude south of the map area. The ice divide formed following the coalescence of ice derived from the Coast Mountains to the west and Cariboo Mountains to the east.

Mineralized debris derived from the Gibraltar porphyry deposits have been eroded by glaciers and transported in these three directions of ice flow as interpreted from the till geochemistry and mineralogy. An overview of the till composition in the region of the Gibraltar Mine is provided in Plouffe et al. (2011, 2014) and Plouffe and Ferbey (2015).

References

Plouffe, A. and Ferbey, T., 2015. Till composition near Cu-porphyry deposits in British Columbia: Highlights for mineral exploration; *in* TGI 4 - Intrusion Related Mineralisation Project: New Vectors to Buried Porphyry-Style Mineralisation, (ed.) N. Rogers; Geological Survey of Canada, Open File 7843, p. 15–37.

Plouffe, A., Anderson, R.G., and Dunn, C.E., 2011. Till composition and biogeochemistry near a porphyry Cu-Mo deposit: Gibraltar Mine, British Columbia; Geological Survey of Canada, Open File 6755, 1 CD-ROM. doi:10.4095/287929

Plouffe, A., Ferbey, T., and Anderson, R.G., 2014. Till composition and ice-flow history in the region of the Gibraltar Mine: developing indicators for the search of buried mineralization; Geological Survey of Canada, Open File 7592,1 poster. doi:10.4095/293839

Author Contact

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

Alain Plouffe
Geological Survey of Canada
601 Booth Street
Ottawa ON
K1A 0E8 Alain.Plouffe@NRCan-RNCan.gc.ca

Coordinate System

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

Bounding Coordinates

Western longitude: 122°27’20”W
Eastern longitude: 122°03’00”W
Northern latitude: 52°41’10”N
Southern latitude: 52°24’00”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:

Deblonde, C., Plouffe, A., Eagles, S., Everett, D., Huntley, D.H., Inglis, E., Kerr, D.E., Moore, A., Parent, M., Robertson, L., Smith, I.R., St-Onge, D.A., and Weatherston, A., 2014. Science language for an integrated Geological Survey of Canada data model for surficial geology maps, version 2.0; Geological Survey of Canada, Open File 7631, 464 p. doi:10.4095/294225

LICENCE AGREEMENT

ACCORD DE LICENCE