



LEGEND

UPPER CRETACEOUS

- Camack suite**
 - UC1: augite olivine basalt flows; hornblende feldspar porphyry andesite and dacite flows; vesicular, augite phytic andesite and trachyte, may include gabbro and monzonite bodies
 - UC2: pink to red weathered, andesite lapilli-tuff and vesicular flows
 - UC3: pale grey to mauve weathered, massive to laminated, plagioclase, biotite, quartz phytic rhyolite; quartz phytic rhyolite with dark grey glassy laminae; interpreted as a flow-dome (70 Ma)
- Tianshanin Formation**
 - TS1: chocolate brown weathered, massive, columnar-jointed olivine basalt, occurring as small plugs intruding rhyolite tuff (UKT)
 - TS2: spilitically to flaggy, pale pink to weathered, laminated to locally fragmental rhyolite tuff with 1-2% quartz phenocrysts and minor disseminated pyrite; volcanic breccia and sandstone containing minor rhyolite and granitoid clasts occur at base; interpreted as a flow-dome complex (70 Ma)

LATE CRETACEOUS

- Prospector Mountain suite**
 - PM1: brown to black, massive, medium-grained, melanocratic biotite-pyroxene monzonite to monzogabbro; gradational with quartz syenite to quartz monzonite (LKP); sparse red beds of copper ironstone after chlorite; border phase of the Seymour Creek stock
 - PM2: pink to white weathered, pink fresh, fine-grained hornblende-biotite quartz syenite to quartz monzonite and lesser syenogranite with glomerulitic biotite in an equigranular, hydromorphic groundmass (Seymour Creek stock - 70 Ma)
- Casino suite**
 - CS1: buff to pink-weathered, heterolithic, clast-supported breccia containing subangular to rounded sand to pebble-sized clasts of felsic porphyry and granitoid rocks in a fine-grained quartzofeldspathic matrix, quartz-sericite-pyrite altered with pervasive secondary kaolinite and local malachite and azurite; hypogene mineralization contains chalcocite-pyrite + molybdenite + scheelite + powellite (Revenue breccia - ca. 76-75 Ma)
 - CS2: beige weathered, pink to grey fresh, massive, medium-grained biotite-hornblende quartz monzonite; sparse tabular bluish grey K-feldspar phenocrysts; minny green saussuritized plagioclase; pink hydromorphic groundmass (Stoddart pluton - ca. 77 Ma)

LOWER CRETACEOUS

- Mount Nansen**
 - LN1: rhyolite tuff-breccia and welded lapilli tuff
 - LN2: light grey to white weathering rhyolite tuff, ranging from densely welded to uncompact lapilli tuff with subangular fragments of tuff and flow-banded rhyolite; local lufuaceous sediments
 - LN3: dark green to black, massive to fragmental, fine-grained plagioclase hornblende clinopyroxene phytic andesite, basalt and latite; minor coarse grained monzogabbro; to diorite may be intrusive equivalents
- Early Cretaceous**
 - EC1: beige to orange weathered, quartz-sericite-pyrite altered heterolithic breccia containing clasts of porphyry, rhyolite, basalt, and ore-bearing breccia; deeply weathered and oxidized (Antonik breccia)
 - EC2: compositionally heterogeneous suite of dikes, plugs, and small plutons including: (1) buff weathered quartz-feldspar porphyry, transitional with apite (mKw); (2) grey to orange weathered, dark grey to pink fresh, crowded felsic-hornblende porphyry with granitic to monzogranitic groundmass; (3) pink to grey weathered, densely porphyritic plagioclase, hornblende, K-feldspar; quartz + biotite porphyry in a fine-grained granitic to monzonitic groundmass (ca. 105 Ma)
 - EC3: white to buff weathered leucogranite; apite, sparsely porphyritic in feldspar and quartz, locally gradational to fine to medium-grained leucogranite phase; minor porphyritic granophyric groundmass with locally developed unidirectional-solidification texture (ca. 105 Ma)
 - EC4: buff to grey weathered, greyish pink fresh, coarse to very coarse grained K-feldspar megacrysts, biotite quartz monzonite, monzogranite and rare syenogranite
 - EC5: buff to grey weathered, pinkish grey fresh, medium-grained, massive to moderately foliated biotite-hornblende granodiorite to quartz monzonite; K-feldspar megacrysts locally present; locally contains subrounded dioritic to gabbroic autoliths
 - EC6: white to pink weathered, white fresh, medium-grained, equigranular, biotite granodiorite with euhedral plagioclase (Revenue granodiorite)

EARLY JURASSIC

- Long Lake suite**
 - LL1: massive to weakly foliated, fine to coarse-grained biotite, biotite-muscovite and biotite-hornblende quartz monzonite to monzogranite, with K-feldspar megacrysts (Granite Mountain batholith - Long Lake suite phase)
 - LL2: medium-grained, massive to weakly foliated biotite-hornblende granodiorite, with local K-feldspar megacrysts (Granite Mountain batholith - Long Lake suite phase)
 - LL3: resistant, dark weathering, massive, coarse to very coarse grained and porphyritic, mesocratic hornblende syenite; locally sheared, commonly fractured and saussuritized; locally well developed layering defined by pink K-feldspar tablets; minor coarse-grained hornblende (Big Creek pluton)

LATE TRIASSIC TO EARLY JURASSIC

- Minto suite**
 - MT1: medium to coarse-grained, foliated biotite-hornblende granodiorite; biotite-rich screens and gneissic schlieren; foliated hornblende diorite to monzonite with local K-feldspar megacrysts (Granite Mountain batholith - Minto suite phase)

YUKON-TANANA TERRANE

LATE DEVONIAN TO EARLY MISSISSIPPIAN

- Simpson Range suite**
 - SR1: foliated metagranite, quartz monzonite and granodiorite; augen granite (defined, approximate, inferred, covered)
 - SR2: isolated to strongly foliated, fine to medium-grained, hornblende-bearing metagranodiorite, metadiorite and metatonalite

DEVONIAN TO MISSISSIPPIAN

- Finlayson**
 - FM1: medium to dark green intermediate to mafic metavolcanic rocks

PROTEROZOIC TO DEVONIAN?

- Showcap**
 - SC1: polydeformed and metamorphosed quartzite, psammite, pelite and marble; minor gneiss and amphibolite; includes minor orthogneiss of the Simpson Range plutonic suite (MGR, MGR)

LEGEND EXPLANATION

- PLUTONIC SUITES:** grouping of plutonic rock units based on age, regional distribution and/or composition
- LAYERED ROCK ASSEMBLAGES:** regionally mappable units generally of Group or Formation rank

Mineral occurrence styles and commodities

- Porphyry Cu ± Au-Mo-Ag
- ▲ Sham Au ± Cu
- High-sulphidation epithermal Au-Ag
- Low-sulphidation epithermal Au-Ag
- ◇ Polymetallic vein Ag ± Pb-Zn-Cu-Au
- Vein Sb ± Au-Ag
- vein trace

Mineralization ages

- Late Cretaceous
- Early Late Cretaceous
- Middle Cretaceous
- Proterozoic

Development status

- Past or present producing deposit
- Deposit
- Prospect

Geological map sources

- 1151/12 HOLMERIE CREEK
- 1151/11 DARK CREEK
- 1151/10 MINTO
- 1151/5 PROSPECTOR MOUNTAIN
- 1151/6 STODDART CREEK
- 1151/7 MERRICE LAKE
- 1151/4 FALSE TEETH CREEK
- 1151/3 MOUNT NANSEN
- 1151/2 ROWLINGSOON CREEK

NOTES

This map presents the bedrock geology of the Mount Freegold district of the eastern Dawson Range, as interpreted from new mapping in 2017, and from previously undated bedrock geologic mapping of the Stoddart Creek sheet (NTS 1151/6) by Carlson (1987). The current map includes mapping of the Klaskan intrusivo-volcanic complex in Eaton (1982). Surface bedrock interpretations of the Nucleus Au-Cu-Ag deposit were adapted from Fonseca and Groux (2009), and other aspects of the geology of the Nucleus-Revenue area were constrained by drilling and surface mapping by Triumph Gold Corp. and predecessors. Mapping in parts of the Mount Freegold area also considered previous company mapping in the Yukon mineral assessment record (Howard, 1988; Main, 1988; Christopher, 1991; Tintina Consultants, 2000).

The Mount Freegold district is dissected by the trace of the Big Creek fault, a significant (east) northwest-southeast strike-slip fault system that has a close spatial relationship to magmatic-hydrothermal mineral occurrences in the eastern Dawson Range. The Mount Freegold district is herein defined as the area of historic and current bedrock and placer exploration and mining activity that includes the Klaskan (1151/038) occurrence and Nucleus (1151/107) and Revenue (1151/042) deposits south of Big Creek; the numerous mineral occurrences north of Seymour Creek and south of Stoddart Creek in the vicinity of Mount Freegold, and the Tintina Hill (1151/050) occurrence southwest of Granite Mountain.

The locations of several Yukon MINFILE occurrences have been corrected on this map (e.g., Tintina Hill, Antonik, Stoddart, Revenue, Nucleus). Some Yukon MINFILE occurrences have been labelled according to preferred, alternative names (i.e., Margarete-Augusta for Guder (1151/033)), and other mineral prospects with no current entry in the Yukon MINFILE database have been added (i.e., Inere, Roppe). Other Yukon MINFILE entries that are classified either as showings or anomalies have been omitted for clarity.

Uranium-lead, ⁴⁰Ar/³⁹Ar, and ¹⁴⁷Sm/¹⁴³Nd geochronological data were compiled from a variety of sources, including journal articles (Binet Betsi and Bennett, 2010; Joyce et al., 2015) and yet unpublished data from the Yukon Geological Survey and MDRU - Mineral Deposit Research Unit at the University of British Columbia. Data with inaccurate or missing location data are omitted. Previously published K/Ar dating results are not included, as they are largely superseded by more accurate ⁴⁰Ar/³⁹Ar and U-Pb data.

Fault interpretations are partly based on interpretation of aeromagnetic data, which includes both regional scale (Miles et al., 2015) and higher resolution data from Triumph Gold Corp. Interpretations of the structural-magmatic evolution of the Mount Freegold district, based on the current mapping and updated geochronological data, are summarized by Friend et al. (2016). A northern strand of the Big Creek fault was active until ca. 77 Ma, when the previously unmapped Stoddart pluton was emplaced. A southern strand of the Big Creek fault passes south of the Nucleus and Revenue deposits, and includes both the Stoddart pluton and the 70 Ma Seymour Creek stock. Thus, the Big Creek fault system was active prior to 77 Ma and after 70 Ma. The fault also has an inferred older history that played a role in an emplacement of mid-Cretaceous igneous rocks and associated mineral occurrences.

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RECOMMENDED CITATION

ALLAN, M.M. and FRIEND, M.A., 2018. Bedrock geological map of the Mount Freegold district, Dawson Range (NTS 1151/2, 3, 5, 7, 10, 11, 12). Yukon Geological Survey, Open File 2018-2, scale 1:50,000.

Digital cartography and drafting by Murray Allan, MDRU - The Mineral Deposit Research Unit at The University of British Columbia.

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Any revisions or additional geological information known to the user would be welcomed by the Yukon Geological Survey.

Paper copies of this map may be obtained from the Yukon Geological Survey, Energy, Mines and Resources, Government of Yukon, P.O. Box 2703 (K-102), Whitehorse, Yukon, Y1A 2C6, PH: 867-667-3201, Email: geology@gov.yk.ca.

A digital PDF (Portable Document File) of this map may be accessed free of charge from the Yukon Geological Survey website: <http://www.geology.gov.yk.ca/>

The digital geology dataset for this map is part of the Yukon Digital Bedrock Geology that can be downloaded from: http://www.geology.gov.yk.ca/update_yukon_bedrock_geology_map.html.

GEOLOGICAL MAP SOURCES

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ONE THOUSAND METRE GRID Universal Transverse Mercator Projection North American Datum 1983 Zone 8

BEDROCK GEOLOGY
MOUNT FREEGOLD DISTRICT, DAWSON RANGE
YUKON

SCALE 1:50 000

0 1 2 3 4 5
Kilometres

CONTOUR INTERVAL 100 FEET
Elevations in feet above Mean Sea Level

True North
20°16'
Magnetic North

Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION 2016
FOR CENTRE OF MAP

Yukon Yukon Geological Survey
Energy, Mines and Resources
Government of Yukon

MDRU Mineral Deposit Research Unit

Open File 2018-2

Bedrock geological map of the Mount Freegold district, Dawson Range (NTS 1151/2, 3, 5, 7, 10, 11, 12) (scale 1:50,000)

by
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