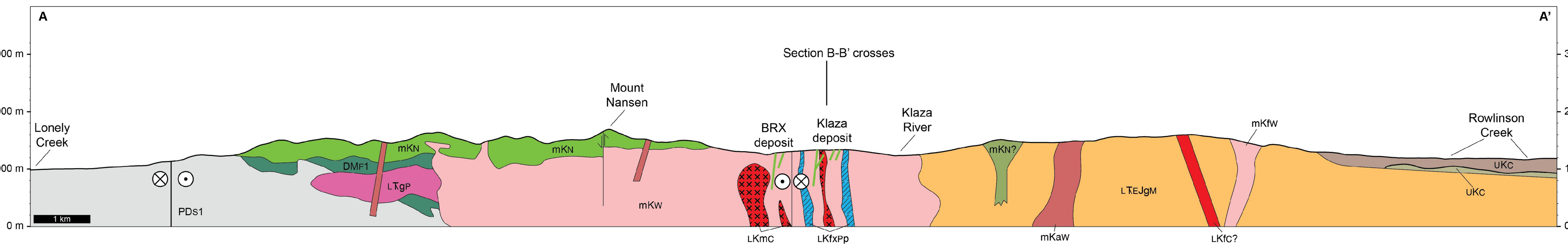
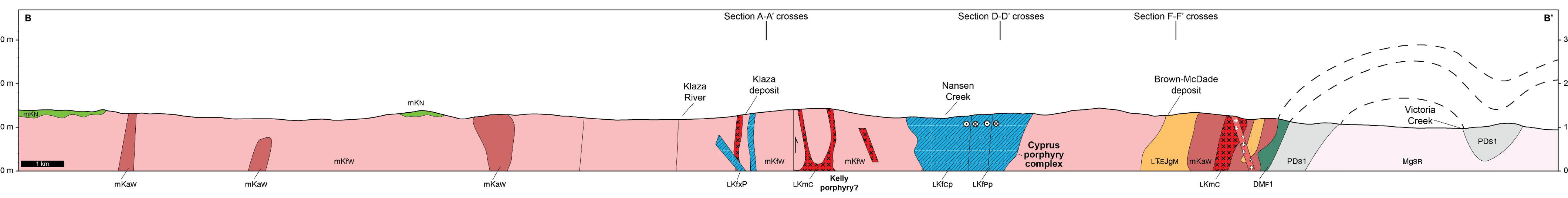




SYMBOLS

geologic contacts (defined, approximate, inferred, covered)...

fault; movement not known (defined, approximate, inferred, covered)...

dextral strike-slip fault (defined, approximate, inferred, covered)...

normal fault (defined, approximate, inferred).................

fault movement towards (L) and away (R) from section

jointing.. 25

bedding or flow layering............................ 25

foliation (dominant).................................... 25

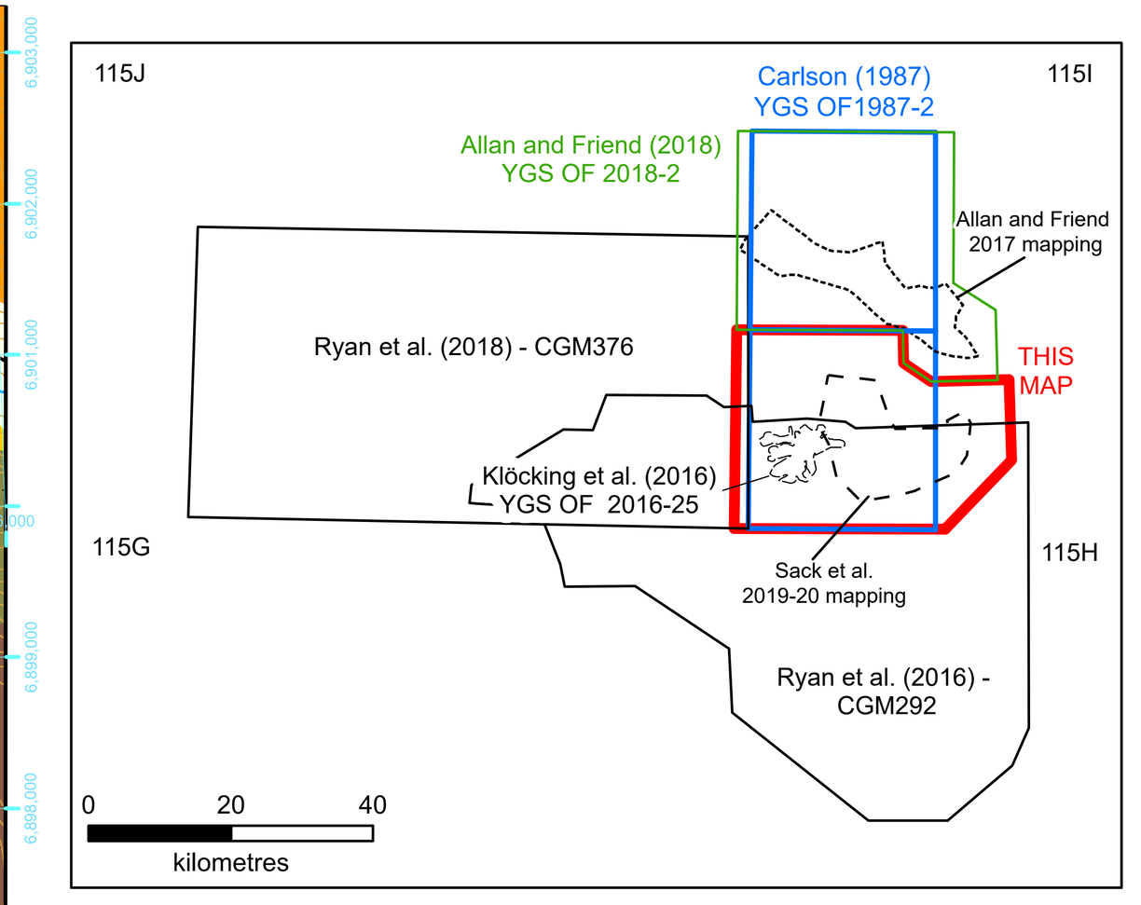
limit of outcrop, subcrop and felsenmeer... ....

radiometric date ($^{238}U/^{206}Pb$, $^{187}Re/^{187}Os$, $^{40}Ar/^{39}Ar$; age in Ma, ± 2s) [Zrn = zircon; Ttn = titanite; Cal = calcite; Mo = molybdenite; Hbl = hornblende; Bt = biotite; Kfs = K-feldspar; Ms = muscovite].................. ● 351 ± 1 ■ 71.0 ± 0.3 ▲ 195.2 ± 0.8

field station (this study)...............................

road (maintained, unmaintained, quad trail).

placer gold creek (major gold bearing stream, proven or high potential to be gold bearing)



GEOLOGICAL MAP SOURCES

LEGEND EXPLANATION

PLUTONIC SUITES: a grouping of plutonic rock units based on age, regional distribution and/or composition

LAYERED ROCK ASSEMBLAGES: regionally mappable units generally of the Group or Formation rank

PALEOGENE

Rhyolite Creek (ca. 57-54 Ma)

PRC1 — *felsic rocks; tan to cream rhyolite to rhyodacite dikes, flows, sills, crystal and ash tuff; smoky quartz±feldspar porphy; locally flow-banded*

UPPER CRETACEOUS

Carmacks Group (ca. 72-68 Ma)

uKfC — *rhyodacite unit*

uKC — *andesite flows; andesite tuff, tuffaceous sediment and minor red weathering conglomerate; basal Carmacks unit, includes Caribou Creek conglomerate of Carlson (1987)*

uKC — *pyroxene±olivine porphyrytic basalt flows; dark red to brown weathered; dark green fresh; may include gabbro and monzonite bodies of LKdP*

Tslansanlin Formation (ca. 78 Ma)

uKmT — *olivine basalt; chocolate brown weathered, massive, columnar-jointed; occurs in upper reaches of Bow Creek, near felsic Carmacks rocks*

LATE CRETACEOUS

Prospector Mountain suite (ca. 72-68 Ma)

LKdP — *pyroxene±biotite porphyritic monzodiorite to monzogabbro; brown to black weathered and fresh, massive, medium-grained, melanocratic; equivalent to uKCg of Colpron et al. (2007)*

LKfxPp — *intrusive breccia; light grey to orange-weathered, heterolithic, clast-supported breccia containing subangular to rounded sand to pebble-sized clasts of light grey porphyritic rocks in a fine-grained cream to pink matrix; locally quartz-sericite-pyrite altered; hypogene mineralization associated with the Cyprus porphyry complex contains chalcopyrite-pyrite ± molybdenite and is ca. 71 Ma (Selby et al., 2001; Lee, 2021)*

Casino suite (ca. 78-74 Ma)

LKmC — *hornblende±pyroxene diorite; fine-grained, equigranular; best exposed in the vicinity of Slate Creek*

LKfC? — *rhyolite to dacite dikes and plugs; light grey to orange-weathered, typically light grey fresh*

LOWER CRETACEOUS

Mt. Nansen Group (115-107 Ma)

mKNAaph — *aphanitic to fine-grained, massive andesite; interpreted as feeder plugs to Nansen volcanic rocks, but could also be related to Carmacks volcanism*

mKNFt — *rhyolite tuff; aphanitic, light grey to buff weathered and fresh, densely welded*

mKNFf — *rhyolite breccia and flow-banded rhyolite; 107.4 ± 0.7 Ma (Klöcking et al., 2016)*

mKNEb — *epiclastic breccia*

mKNAm — *plagioclase-hornblende phyric andesite; dark green to black, massive, fine-grained; 115 to 112 Ma (Klöcking et al., 2016)*

mKNAb — *andesite breccia; dark green to brown weathered and dark green to black fresh, monomict with andesite groundmass; 115 to 112 Ma (Klöcking et al., 2016)*

EARLY CRETACEOUS

Whitehorse suite (111-104 Ma)

mKaW — *quartz-plagioclase-biotite porphyritic quartz latite; pink weathered and fresh; ca108Ma (Sack et al., 2022b)*

mKfW — *biotite-hornblende granodiorite; fine to medium-grained, equigranular; main phase of the Dawson Range batholith ca. 108 to 105 Ma (Klöcking et al., 2016; Mortensen et al., 2016)*

mKfWp — *rhyolite to dacite dikes and plugs; light grey to orange-weathered, typically light grey fresh; plagioclase-quartz porphyritic with plagioclase>quartz; plagioclase is white, 2-3 mm, commonly clay altered and subround, quartz is clear, 3-5 mm and angular to subround, commonly embayed*

EARLY JURASSIC

Long Lake suite (188-183 Ma)

EJyL — *very coarse grained, crowded K-feldspar porphyritic hornblende monzonite to syenite; K-feldspar phenocrysts up to 5 cm. Only recognized in the Big Creek area, 185 to 184 Ma (Sack et al., 2022b)*

LATE TRIASSIC TO EARLY JURASSIC

Minto suite (204-194 Ma)

LTrEJgM — *K-feldspar porphyritic hornblende granodiorite; medium to coarse-grained, moderately foliated to unfoliated; ca. 199 Ma (Sack et al., 2021; 2022b)*

LTrEJgMC — *hornblende granodiorite; medium to coarse-grained, moderately foliated to unfoliated, equigranular; best exposed on eastern margin of plutons; presumably ca. 199 Ma based on association with LTrEJgM*

LATE TRIASSIC

Pyroxene Mountain suite (220-214 Ma)

LTrPx — *hornblende±biotite tonalite; medium-grained, weakly foliated, equigranular; ca. 216 Ma (Sack, 2021a)*

YUKON-TANANA TERRANE

LATE DEVONIAN TO EARLY MISSISSIPPIAN

Sulphur Creek suite (ca. 264-252 Ma)

PgS — *fine-grained monzogranite; grey to pink weathered, moderately foliated to gneissic; sparsely K-feldspar and quartz porphyritic*

LATE DEVONIAN TO EARLY MISSISSIPPIAN

Simpson Range suite (ca. 365-350 Ma)

MgSR — *biotite±hornblende metagranodiorite; light grey to orange weathered and light grey fresh, foliated; local feldspar augen; locally well-foliated and difficult to distinguish from quartzofeldspathic Snowcap rocks; 365 to 350 Ma (Joyce et al., 2020)*

DEVONIAN TO MISSISSIPPIAN

Finlayson assemblage

DMF2 — *felsic schist; pale yellow-orange weathered; fine-grained; ca. 348 Ma (Joyce et al., 2020)*

DMF1 — *amphibolite; dark green; strongly foliated and locally compositionally layered; generally schistose, locally gneissic; more micaceous than Snowcap amphibolite (PDS3)*

PROTEROZOIC TO DEVONIAN?

Snowcap assemblage

PDS3 — *amphibolite; dark green weathered and fresh; fine to medium-grained, equigranular and foliated*

PDS1 — *quartzite and schist; grey to white quartzite, micaceous quartzite and quartz-muscovite-biotite (± garnet) schist; strongly foliated and layered; locally forms a quartzofeldspathic gneiss difficult to distinguish from Simpson Range metagranitoid (MSR)*

Digital cartography and drafting by Patrick Sack, Yukon Geological Survey.

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

A paper copy of this map may be obtained from the Yukon Geological Survey, Energy, Mines and Resources, Government of Yukon, Room 102, 300 Main Street, Whitehorse, Yukon, Y1A 2B5. 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

NOTES

This map presents a compilation and re-interpretation of the bedrock geology in the Mount Nansen area. It is an update from the preliminary version released in 2021 (Sack et al., 2021). The main updates are based on new U-Pb zircon ages for Cretaceous magmatic rocks. Most economically significant are the CA-TIMS U-Pb zircon crystallization ages for the Kelly (ca. 78 Ma) and Cyprus porphyries (ca. 71 Ma; Lee et al.) and the LA-ICPMS U-Pb zircon crystallization age of ca. 111 Ma for the Dickson Hill plug (Sack et al., 2022a). New CA-TIMS crystallization ages (ca. 108 Ma) for two phases of the Bow Creek granite redefine that body as part of the Whitehorse magmatic suite and a new LA-ICPMS crystallization age of ca. 199 Ma from the deformed granodiorite which hosts the Brown-McDade deposit confirm a Minto suite designation for those rocks (Sack et al., 2022a).

A total of 40 days of 1:25 000 mapping was conducted in 2019 and 2020 in the Mount Nansen porphyry district. The Mount Nansen porphyry district is herein defined as the area of historic placer gold and hard rock gold-silver production centred on the headwaters of the East Fork of Nansen Creek. The majority of MINFILE occurrences in the district are within a 12 x 6 km, northwest elongate area (Hart and Langdon, 1997) shown at 1:20 000 on sheet 2. In the northwestern part of the district, vein and porphyry mineralization is related to Late Cretaceous porphyritic rocks of the Casino and Prospector Mountain suites (Lee et al., 2020). Mineralization in the southeastern part of the district appears to be primarily related to Early Cretaceous porphyritic dikes and plugs of the Whitehorse magmatic suite.

Our mapping is combined with previously undigitized 1:30 000 (published at 1:50 0000) bedrock mapping by Carlson (1987), 1:15 000 mapping by Klöcking et al. (2016) and 1:100 000 mapping by Ryan et al. (2016, 2018); see geological map sources inset for coverage of these maps. In addition, this map takes into consideration an unpublished reinterpretation of Carlson (1987) by Craig Hart. Company geologic data are taken from Stroshein (1999) for the Brown-McDade deposit [115I 064], Andersen and Stroshein (1998) for the Flex deposit [115I 137], Sawyer and Dickinson (1976) for the Cyprus porphyry complex [115I 066 and 140] and unpublished data from Rockhaven Resources for the Klaza deposits [115I 067 and 150]. Veins and breccia bodies are taken from Walls and Eaton (1987), Stroshein (1999) and Sawyer and Dickinson (1976) with locations refined using satellite imagery taken in 2013; classification of these bodies into defined or approximate are not NI 43-101 compliant but rather represent confidence similar to that for contacts and faults. Descriptions of MINFILE occurrences are modified from Hart and Langdon (1997).

Uranium-lead, $^{187}Re/^{187}Os$, $^{40}Ar/^{39}Ar$ and $^{40}K/^{40}Ar$ geochronological data are from this study, Sack et al. (2022a and b), Lee (2021), and the Yukon geochronology database. The location of approximately 20 samples in Yukon geochronology database were modified based on field checks and location notes in the database; geochronological samples which could not be confidently located are omitted. Previously published Rb/Sr dating results are not included as they are largely superseded by more accurate $^{40}Ar/^{39}Ar$ and U/Pb data.

The Mount Nansen area lies within the most extensive (pre-Reid) glacial limit in Yukon, and just beyond the penultimate (Reid) glacial limit (glacial limits inset map; Duk-Rodkin, 1999). The majority of the study area is underlain by material derived from bedrock immediately below or upslope, i.e., colluvium (Jackson, 1997); well exposed bedrock is restricted to ridges and mountain tops (Carlson, 1987). Significant thicknesses of eolian sand deposited in the valleys of Nansen and Victoria creek are associated with the Reid glaciation, which reached its maximum extent immediately south and east of the study area ~160,000 years ago (Demuro et al., 2012). The surficial geology displayed on the map is simplified from Jackson (1997) but due to discrepancies in the original map, a 140 m shift to the west has been applied. Placer potential for creeks is modified from Lipovsky et al. (2001).

The Mount Nansen porphyry district comprises a basement of Late Triassic to Early Jurassic plutonic rocks that intrude Paleozoic metamorphic rocks. Early (ca. 115 to 104 Ma) and Late (ca. 78 to 68 Ma) Cretaceous volcanic-plutonic complexes were subsequently built on this basement. Porphyry system mineralization (epithermal, porphyry and undivided vein/breccia deposit styles) is associated with both Cretaceous magmatic events. A new Re/Os molybdenite age of 108.5 Ma ± 0.5 Ma from the Flex deposit supports previous interpretations of 'mid-Cretaceous' mineralization for these veins (Mortensen et al., 2016). A mineralization age for the past-producing Webber [115I 065] and Brown-McDade deposits is not clear, though proximity with, and similarity to the Flex deposit suggest they are Early Cretaceous. The location of several MINFILE occurrences have been updated on this map (e.g., Huestis, Eliza South, Klaza). Another new Re/Os molybdenite age of 76.3 ± 0.4 Ma and CA-TIMS U-Pb zircon crystallization ages of 78.11 ± 0.03 Ma and 71.27 ± 0.03 Ma confirm Casino and Prospector Mountain age magmatism and mineralization at the Kelly and Cyprus porphyries, respectively (Lee et al. 2020) supporting previous interpretations of Selby and Creaser (2001) and Lee (2021).

Dikes are steeply dipping. Early Cretaceous Whitehorse suite dikes mostly strike east to northeast, Late Cretaceous dikes strike northwest. Fault interpretations are primarily based on bedrock mapping, with fault traces extended.

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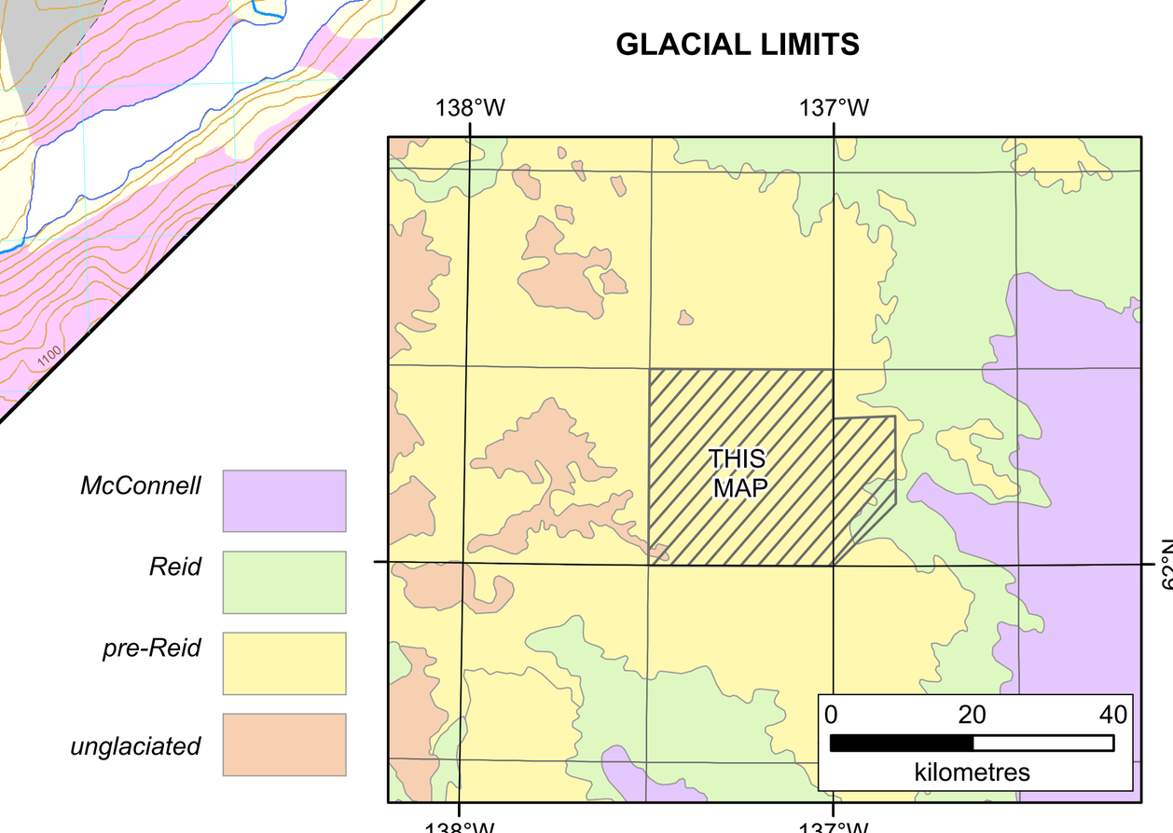
RECOMMENDED CITATION

Sack, P.J., Eriks, N. and van Loon S., 2022. Revised geological map of Mount Nansen area (NTS 1115I/3 and part of 115I/2). Yukon Geological Survey Open File 2022-4, 2 sheets; sheet 1 scale 1:50 000, sheet 2 scale 1:20 000.

GLACIAL LIMITS



1:50 000-scale topographic base data produced by CENTRE FOR TOPOGRAPHIC INFORMATION, NATURAL RESOURCES CANADA

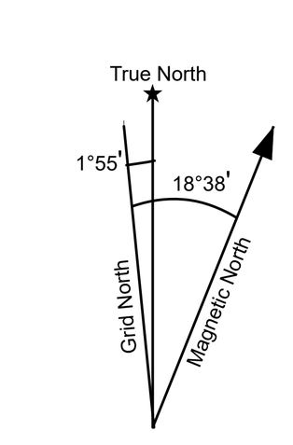
ONE THOUSAND METRE GRID
Universal Transverse Mercator Projection
North American Datum 1983
Zone 8

BEDROCK GEOLOGY
MOUNT NANSEN
YUKON

SCALE 1:50 000

0 1 2 3 4
Kilometres

CONTOUR INTERVAL 20 metres
Elevation in metres above mean sea level



Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION 2020
FOR CENTRE OF MAP

115I/5 PROSPECTOR MOUNTAIN	115I/6 STODDART CREEK	115I/7 MERRICE LAKE
115I/4 FALSE TEETH CREEK	115I/3 THIS MAP	115I/2 ROWLINSON CREEK
115H/13 SCHIST CREEK	115H/14 MACKINTOSH CREEK	115H/15 UPPER NISLING RIVER

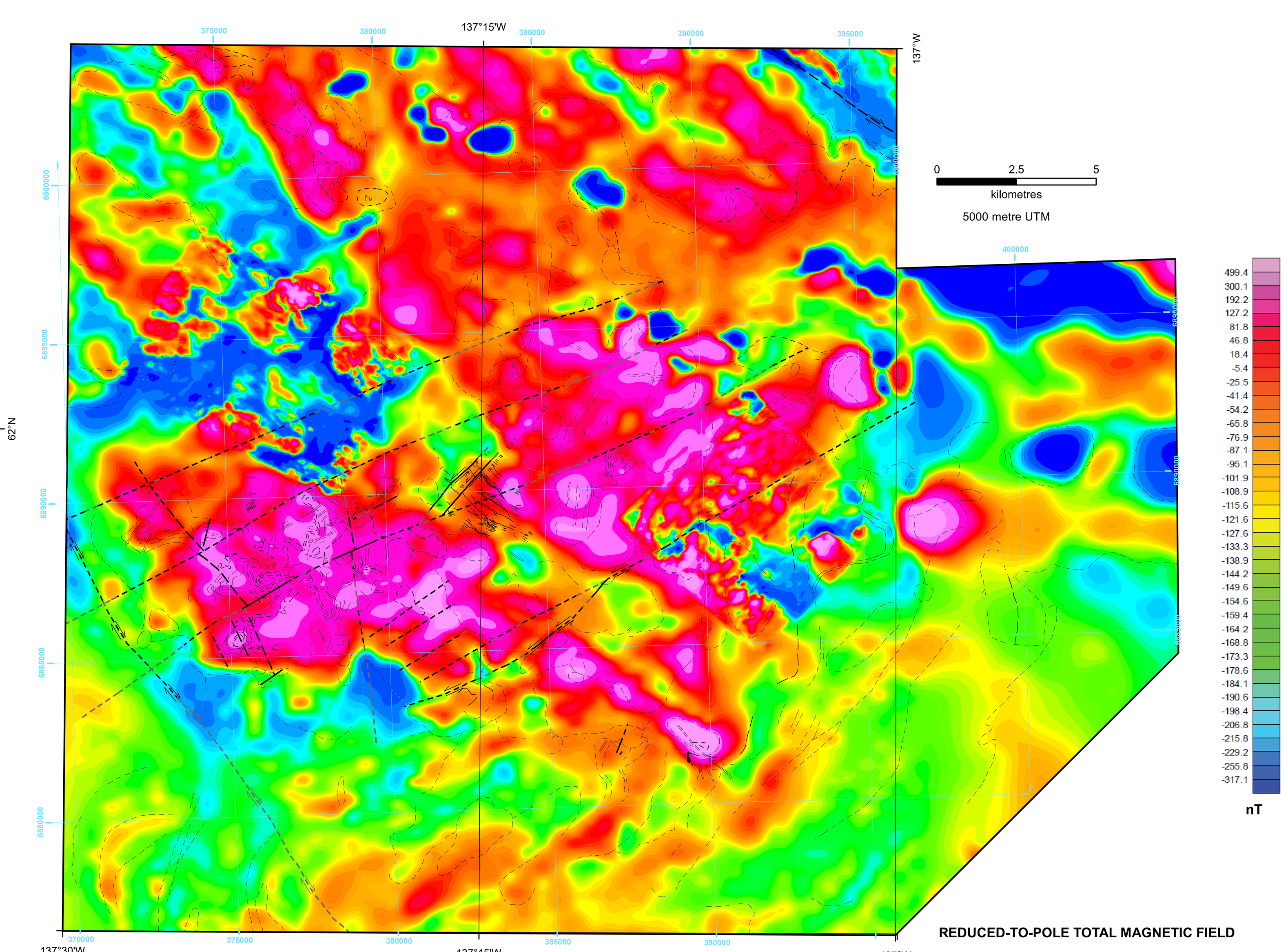
Yukon Geological Survey
Energy, Mines and Resources
Government of Yukon

Open File 2022-4

Revised geological map of Mount Nansen area (NTS 115I/3 and part of 115I/2) (scale 1:50 000) Sheet 1 of 2

by

Patrick Sack, Nicole Eriks and Sydney van Loon



REDUCED-TO-POLE TOTAL MAGNETIC FIELD