DESCRIPTIVE NOTES

Pangnirtung Fiord map sheet, northwestern Cumberland Peninsula, contains some of the most rugged and scenic topography on Baffin Island. Mount Asgard (2015 m) rising some 1600 m above the adjacent valley floor (cover photo), is perhaps the most famous peak, while Mount Odin (2147 m) is the highest. Initially mapped at a reconnaissance scale in 1970 (Jackson, 1971), much of this map sheet was designated part of Auyuittuq National Park in 1976. Recent mapping of Cumberland Peninsula, as part of the Geo-mapping for Energy and Minerals (GEM) program, was focused outside of Auyuittuq park (Sanborn-Barrie et al., 2011a,b,c; Sanborn-Barrie and Young, 2013a,b,c); Sanborn-Barrie et al., 2013a,b) in order to update geoscience knowledge for an extensive region between the communities of Pangnirtung and Qikiqtarjuaq. This map integrates new GEM data with archival knowledge in order to provide insight into the bedrock geology near Pangnirtung, thereby allowing local residents and visitors to the region insight into the composition and age of rocks that make up its majestic peaks and pinnacles, the beauty of which is recognized as a national treasure. Density of exposure fluctuations within this map sheet is limited due to topography and snowmelt cover, such that most landings by helicopter were made at 10 km intervals.

The Pangnirtung Fiord map sheet is dominated by granitoid rocks known to be about 1900 million years old, formed during the middle Paleoproterozoic era. It exposes lesser ca. 1950 million year old metasedimentary rocks, mainly occuring as rusty-weathering inclusions within the Paleoproterozoic granitoid rocks, and may also contain potentially ancient (Archean era) metasedimentary and plutonic rocks. These three components of the map sheet are described below from oldest to youngest.

Ancient tonalite gneiss (unit ATgn) is suspected to outcrop on the west side of the Weasel River where banded gray gneiss was reported (Jackson, 1971). Although this unit has not been recognized elsewhere on Baffin Island, Archean rocks are well known in northern Labrador (Wardle et al., 1997) and elsewhere on Cumberland Peninsula corresponds to tonalitic rocks dated between 2800–2770 million years of age, may correspond to non-magnetic tonalite-granodiorite of Archean age. This undated unit (unit PAgd) is described at several localities as comprising coarse-grained, gneissic-green to buff-weathering rocks containing quartz and feldspar with <15% hypersthene-hornblende-biotite, and trace amounts of clinopyroxene locally.

Metamorphosed remnants of clastic sedimentary rocks (units PAsp, PAqss) and mafic rocks (unit PAgb) are suspected to be Archean or/and Paleoproterozoic. These occur sparsely throughout the map area, as infolded paragneiss and inclusions hosted by the younger Paleoproterozoic intrusions (described below). Metasedimentary rocks are mainly psammitic (sandy) to semipelitic (more mushy). One remnant east of Summit Lake, is the far northeast corner of the map sheet, exposes quartzite (unit Pqz), consisting of ~85% glassy quartz grains. This unit, which is characteristic of the Hoare Bay group elsewhere on Cumberland Peninsula, is associated at this locality with grey fine-grained, equigranular, foliated psammite (unit Pps, 1 km thick), and Paleoproterozoic containing minor pyrite, pyrrhotite, and chalcopyrite. A small outcrop of sheared, grey quartzite is interpreted on the west shore of Kekerten Bay.

The majority of the map sheet exposes medium- to coarse-grained quartzo-feldspathic plutonic rocks that are part of a plutonic belt that extends more than 300 km from Pangnirtung to Qikiqtarjuaq (Fig. 1). Designation of this belt as the Qikiqtarjuaq plutonic suite is based on extensive exposures of compositionally similar rock types (Wheeler et al., 2012), which yield similar ages between 1900 and 1880 million years old from seven localities mainly northward of this map sheet. These ages reveal that the spectacular peaks and pinnacles exposed throughout Auyuittuq National Park were created from magmas that crystallized within a 20 million year interval, were subsequently uplifted, and dramatically eroded by ice, water and wind into the present landscape. Predominant rock types comprising the Qikiqtarjuaq plutonic suite are: biotite-hornblende granodiorite (*granodioritic-type*), Brown weathering, hypersthene-bearing, monzogranite-granodiorite (*charnockite*), with minor quartz monzonite and hypersthene quartz syenite (*anti-Frost*) containing up to 10% hypersthene in various stages of retrogression (breakdown) to biotite dominate the central map sheet. This phase contains typically contains <5% biotite and ilmenite-magnetite. These rocks are reddish-brown, greasy greenish brown on fresh surfaces, reflecting high-temperature modification of *feldspar crystal structure during post-crystallization* high-grade metamorphism which took place about 1860–1840 million years ago (Berman et al., 2013). Within the map sheet, this phase is dated at 1894 ± 1 Ma (Rayner et al., 2012) at scenic Aulatsivik Point, located northeast, and within sight of Pangnirtung.

Pale-gray-pink-weathering granodiorite to monzogranite (unit PgrI) is prominent in the eastern part of the map sheet. This phase contains 10–15% biotite, isolated aggregates of dark mid garnet, and may contain <5% quartz phenocrysts, up to 1 cm in length, and/or K-feldspar phenocrysts up to 2 cm in length. This phase is commonly crosscut by pink, fine- to medium-grained, equigranular, biotite-garnet-bearing leucogranite dikes up to 3 m wide, and to contain the charnockite phase as inclusions. Unit PgrI yielded an age of 1889 ± 3 Ma (Rayner et al., 2012) from a granite south of Akiolikiq Lake (Sanborn-Barrie and Young, 2013a), consistent with the relative age relationships apparent in the field. In general, this slightly younger, lower grade phase yields a weaker magnetic response (Fig. 2) relative to the older charnockitic phase.

Minor components of the Qikiqtarjuaq plutonic suite include more mafic, brown-weathering hypersthene-bearing quartz diorite/tonalite (unit PgbI), with lesser quartz monzonite which is exposed across Pangnirtung Fiord. A similar unit exposed at the head of Kingnait Fiord was dated at 1894 ± 1 Ma (N. Rayner, unpubl. data 2011). Pink-red-weathering syenogranite-monzogranite-granodiorite (unit PgrY) occurs in the northern half of the map sheet, where it forms a prominent, east-west trending, 2 km wide, 20 km long, steep-walled, flat-topped ridge between Pangnirtung and Kingnait Fiords, and is similar in appearance, particularly in contact with unit PgrI. Pink dykes, up to 3 m wide, cut unit PgrI and Pgr establishing the pink granite phase to be one of the younger phases in the map sheet. All phases of the Qikiqtarjuaq plutonic suite display only minor retrogression which is indicated by the presence of trace amounts of chlorite, sericite, uralite, blue-green hornblende, leucoxene-green biotite, and epidote.

Rocks within the map sheet are variably strained. Those in the eastern half generally display a moderately to strongly developed foliation and a strong extensional (linear) fabric, while those in the western half of the map sheet appear more massive to weakly foliated. Two generations of faults were noted at one locality west of Pangnirtung Fiord (Nauyat Bluffs region), consistent with elsewhere on Cumberland Peninsula, where two generations of fabrics provide evidence of two Paleoproterozoic deformation events (Berman et al., 2013). In the northeast corner of the map sheet, a northeast-trending corridor of strong cleavage development may reflect a brittle-ductile fault along the northern margin of a discrete granite pluton. This fault zone may extend southward to Shark Fiord, given its parallel trend.

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Abstract

Cumberland Peninsula, eastern Baffin Island, is an under-explored, frontier region with significant diamond, base- and precious-metal potential. Archean (2.97–2.77 Ga) foliated to gneissic tonalitic plutonic rocks with enclaves of 3.27 Ga metasedimentary rocks, are intruded by 1.9–1.88 Ga metaplutonic rocks form a structural basement, exposed in the south and north. Metasedimentary cover rocks of the Paleoproterozoic Hoare Bay group, exposed from the central to the northeast part of the peninsula, are in tectonic contact with the basement gneisses. The cover sequence includes widespread semipelite-psammite with minor quartzite, marble, silicate- and oxide-facies iron-formation, chert and graphitic-pyritiferous shale, and two geochemically-distinct strands of ultramafic-mafic metavolcanic rocks of pyroclastic origin. Basement and cover rocks are cut by 1.9–1.88 Ga charnockite, biotite-garnet granodiorite and lesser quartz diorite of the Qikiqtarjuaq plutonic suite. Major structures and medium to high-grade metamorphic assemblages are attributed to polyphase tectonometamorphism between ca. 1.90–1.84 Ga.

Résumé

La péninsule Cumberland, dans l'est de l'île de Baffin, est une région pionnière sous-explorée qui revêt un important potentiel en diamants, métaux usuels et métaux précieux. Des roches plutoniques foliées à gneissiques de composition tonalitique d'âge archéen (2,97–2,77 Ga) forment un socle possédant des enclaves de 3,27 Ga, datées de roches métasédimentaires de couverture du Groupe de Hoare Bay du Paléoprotérozoïque, qui affleurent de la partie centrale à la partie nord-est de la péninsule, sont en contact tectonique avec les gneiss du socle. La séquence de couverture se compose d'une abondance de semipélite-psammite et de quantités accessoires de quartzite, de marbre, de formation de fer à faciès silicaté et à faciès oxydé, de schiste graphitique-pyritifère ainsi que de deux lignées géochimiquement distinctes de roches métavolcaniques ultramafiques-mafiques d'origine pyroclastique. Les roches du socle et de la séquence de couverture sont recoupées par des intrusions de 1,9 à 1,88 Ga de la suite plutonique de Qikiqtarjuaq formées de charnockite, de granodiorite à biotite-grenat et de quelques rares filons de diorite quartzique. Les structures principales ainsi que les paragenèses métamorphiques de degré intermédiaire à élevé sont attribuées au tectonométamorphisme polyphasé qui s'est déroulé approximativement entre 1,90 et 1,84 Ga.

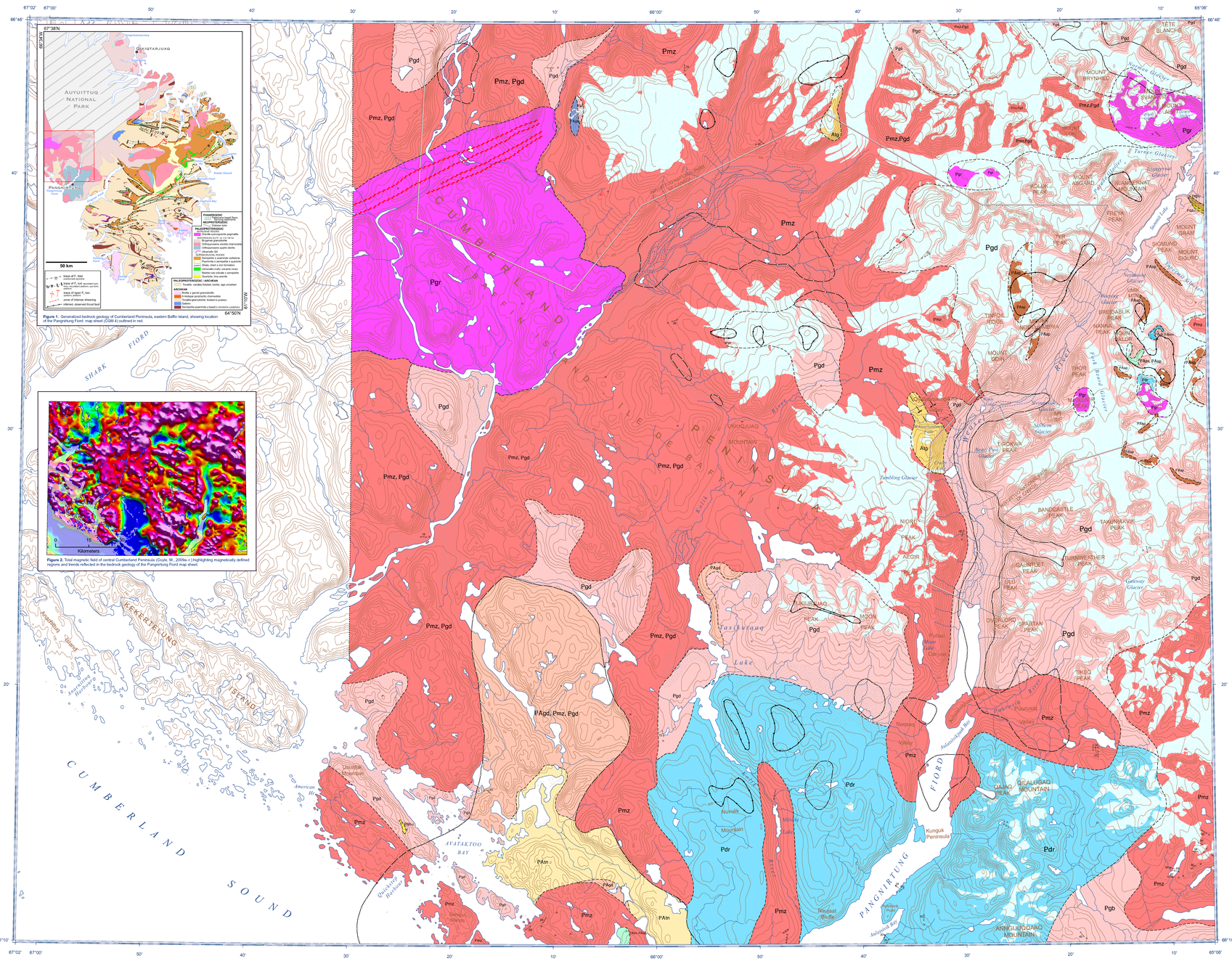


Figure 1. Generalized bedrock geology of Cumberland Peninsula, eastern Baffin Island, showing location of the Pangnirtung Fiord map sheet (CGM 4) outlined in red.

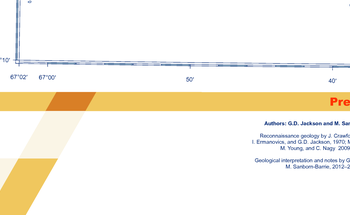
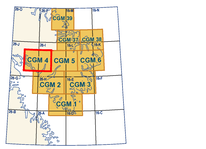


Figure 2. Total magnetic field of central Cumberland Peninsula (Coyle, M., 2008a-r.) highlighting magnetically defined regions and trends reflected in the bedrock geology of the Pangnirtung Fiord map sheet.



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

Cover illustration
View to south of the twin pillars of Mount Asgard, exposing 1.88–1.89 billion year old granodiorite of the Qikiqtarjuaq plutonic suite, western Cumberland Peninsula, Nunavut. Photograph by M. Sanborn-Barrie, 2014-022

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CANADIAN GEOSCIENCE MAP 4
GEOLOGY
PANGNIRTUNG FIORD
Baffin Island, Nunavut
1:100 000

Preliminary

Canadian Geoscience Maps

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Canada

Authors: G.D. Jackson and M. Sanborn-Barrie

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Cartography by P. O'Regan, M. Molnot, B. Hillary, and O. Brown

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CANADIAN GEOSCIENCE MAP 4
GEOLOGY
PANGNIRTUNG FIORD
Baffin Island, Nunavut
1:100 000

2 0 2 4 6 8 km

Preliminary

Map projection Universal Transverse Mercator, zone 20. North American Datum 1983

Base map at the scale of 1:250 000 from Natural Resources Canada, with modifications.
Elevations in metres above mean sea level.
The offset of contour lines at 66°W is due to a change in the contour interval between topographic sheets.

Mean magnetic declination 2014, 32°44'W, decreasing 29.2' annually. Readings vary from 32°16'W in the SW corner to 33°09'W in the NE corner of the map.

Preliminary

The Geological Survey of Canada welcomes corrections or additional information from users.

Data may include additional features not portrayed on this map. See documentation accompanying the data.

Additional references are included in the map information document.

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

Preliminary

LEGEND

UNDERSTANDING THE LEGEND

The age category (Eon) of bedrock material is indicated by the first upper case letter, the lithology indicated by abbreviated lower case, e.g. Ip (Paleoproterozoic intrusive rocks), Ag (Archean granite), Ma (Mesozoic mafic rocks). Where more than one age category is present, the units are listed in the order of the geologic epoch, separated by a comma (,) from the secondary (or other) age category, the secondary unit is separated by a comma (,) from the tertiary unit. The digital geodatabase denotes primary, secondary, and tertiary units as separate fields. Brackets denote unit occurring as inclusion in the host unit, where notable.

This legend is common to CGM 4, CGM 5, CGM 6, CGM 37, CGM 38, and CGM 39 and is slightly modified from that for CGM 1, CGM 2, and CGM 3.

Coloured legend blocks and non-grey lines indicate map units that appear on this sheet.

QUATERNARY
PLEISTOCENE–RECENT

Unconsolidated deposits: mainly glacial till and fluvial deposits.

CENOZOIC
PALEOGENE

Cv — **Basaltsandstone**: Flat-lying picritic basalt flows and breccia with local underlying impure sandstone, shale, conglomerate, and coal (Clarke and Upton, 1971).

NEOPROTEROZOIC ca. 723 Ma

Ndg — **Diabase dyke**: WNW-trending, medium brown weathering, equigranular, magnetite-bearing gabbro dyke. Dyke is part of a regional swarm (Fahrig and Jones, 1969; Baragar et al., 1992); typically 1–3 m wide, up to 6 m wide; local sills (Cape Dyer).

PALEOPROTEROZOIC
POST-TECTONIC PLUTONIC ROCKS

Pgr — **Granite**: coarse-grained, weakly foliated, coarse-grained to pegmatitic, typically white-weathering peraluminous muscovite-biotite-garnet±tourmaline granite. Pink variant is white-weathering syenogranite with 1–5% biotite as coarse books, locally up to 10% muscovite±garnet±tourmaline.

SYN- to LATE-TECTONIC PLUTONIC ROCKS

$Pgnd_{ann}$ — **Peraluminous granodiorite**: Beige-weathering, leucocratic, weakly foliated biotite-(muskovite)-granodiorite, typically cut by mm- to cm-wide veins of muscovite ± garnet, concordant to the dominant shallow-dipping tectonic fabric in basement plutonic rocks and cover rocks of the Hoare Bay group. Dated at 1839 ± 2 Ma at Canyon Wash locality M107, 25 km east of Kingnait Fiord (CGM 5).

Pgd, Pgd_1 — **Hornblende quartz diorite/tonalite**: pink-D$_2$, pre-D$_2$, medium-grained, foliated hornblende-bearing quartz diorite, characterized by abundant hornblende-bearing inclusions of more mafic composition, possibly of related (cognate) origin.

PRE- to SYN-TECTONIC PLUTONIC ROCKS

Ptn — **Tonalite**: light grey to white weathering, variably foliated homogeneous biotite tonalite±hornblende±granodiorite; locally containing xenoliths of marble (P_m) and semipelite (PAp$_s$).

QIKIQTARJUAQ PLUTONIC SUITE ca. 1.88–1.9 Ga

Pmz — **Granodiorite-monzogranite**: weakly foliated, light grey to beige-weathering, medium-grained, equigranular biotite±magnetite-garnet±orthopyroxene granodiorite-monzogranite; 3% burgundy garnet typically as aggregates; may be K-feldspar or quartz porphyritic; patchy granulite-facies assemblages and colouration.

Pmz — **Charnockite**: weakly to strongly foliated, coarse-grained, biotite-orthopyroxene monzogranite±granodiorite (charnoenderbite); with distinctive greasy brown fresh surface indicative of attainment of granulite facies, commonly containing elliptical, 1 cm long-axis, orthopyroxene partially retrogressed to biotite and serpentine (bastite); locally containing 10–15% K-feldspar phenocrysts at times displaying orbicular structure; cuts pre-porphyritic ultramafic sills at two localities and is commonly cut by monzogranite pegmatite veins. Hatch lines denote agmatite with abundant predominantly psammitic/pelitic-silicate inclusions.

Pdr — **Quartz-diorite-tonalite**: Variably foliated, olive-brown weathering, equigranular, medium-grained, orthopyroxene±biotite-bearing quartz diorite-tonalite; well exposed, prevalent unit on the peninsula between Pangnirtung and Kingnait fiords. Hatch lines denote agmatite structure with abundant predominantly psammitic/pelitic-silicate inclusions.

Pum — **Ultramafic sills**: concordant sills of ultramafic composition are represented by three main types: 1) most prevalent is dark green, to brown-weathering clinopyroxene-orthopyroxene-magnetite±biotite±hornblende pyroxenite occurring as 50–100 m thick sills intrusive into supracrustal rocks and tonalitic gneiss, and cut by K-feldspar porphyritic charnockite (Pmz); pyroxenite displays diagnostic weathered surface due to 15% olivine-pseudomorphs which weather to a brown 5-8 mm pits; 2) black-weathering, fine-grained, equigranular, non-magnetic, ilmenite-bearing ultramafic sills, average 3–5 m thick, forming resistant ridges exposed as discontinuous black rubble in till-covered region SE of Kingnait Fiord; 3) minor <2 m wide, bright green-weathering clinopyroxenite with pale green to white weathering plagioclase-rich interiors. Sills <10 m wide are denoted by a purple line labeled Pum.

SUPRACRUSTAL ROCKS

HOARE BAY GROUP

$Pssp_s$ — **Semipelite±psammite**: light brown-, grey- and/or rusty-weathering layered semipelite±psammite commonly containing 15–40% biotite, 1–2 mm, 1 to 10% garnet as 2–4 mm porphyroblasts, rarely up to 2 cm and up to 10% sillimanite as fibrous, fluffy crystals or as white-weathering nodules (Swerkiesel); brick red weathering units contain up to 15% graphite; rarely muscovite-bearing; typically occuring as 2–4 m thick panels, but may be up to 12 m thick; interlayered with psammite, rarely quartzite.

Pps_s — **Psammite±semipelite**: grey, white, creamy-beige weathering psammite as cm- to m-scale layers, up to 5 m thick, generally semipelitic, rarely with calc-silicate; contains 5–15% biotite 0.5–1 mm, <5% garnet, rarely andalusite±staurolite; lenticular to elongate calc-silicate concretions denoted by pale green open oval symbol.

O_s, Si_s — **Iron-formation**: oxide- (O$_s$) and/or silicate-facies (Si$_s$) typically thin (<1 m) and lenticular interbeds of silicate-facies iron-formation in the western map area and thicker (up to 5–10 m), predominantly oxide-facies, in the eastern and northeastern map areas.

PSh_s — **Shale±siltstone**: grey to black weathering shale±siltstone; black shale is generally 1–3 m wide with abundant graphite and sulphides, commonly gossanous or marked by white clay alteration coating on weathered surface; locally bedding and cleavage coated by pyrite; grey shale is 1–100 m wide, fissile to flaggy, may be associated with dolomitic marble±calc-silicate and locally appears to transition up section into black shale. Shale horizons < 1 m wide are denoted by a grey line labeled PSh_s.

Cr — **Chert**: massive to laminated chert, typically 1–3 m wide, locally up to 5 m wide; generally deep purple to rusty-weathering (gossanous) but locally pale grey- and white-weathering and thinly to thickly laminated (i.e. near Exeter Sound); observed to occur structurally above and below metavolcanic rocks (P_{uv}).

Pqz_m, Pq_m — **Pink orthoquartzite**: vitreous, hematized, pink-weathering, fine- to medium-sand size orthoquartzite; 1–2 m thick, may have associated minor intercalated, chalky grey-weathering psammite and/or chert.

Pu_V, Pu_I — **Ultramafic-mafic volcanic rocks**: komatiitic, basaltic-komatiitic to basaltic volcanic rocks, variably textured including fragmental, pillowed and massive flows; typically bright green weathering, characteristic of high-Mg composition; locally dark green-black, Fe-tholeiite as pillowed flows with light buff-weathering elliptical varioles (Tobias Road) or as massive, aphanitic slightly plagioclase-phyric flows immediately west of Mermaid Fiord; minor interbedded, cream-weathering psammite to quartzite occurs as 1 m wide beds (i.e. Black Island); this unit is thickest in the east and northeast, and thinned or absent in the western map area.

Pc_m, Pc_s — **Marble–calc-silicate**: pale brown- to light-grey weathering marble, typically composed of calcite, olivine-clinohumite assemblages; average 1–3 m thick; lesser associated pale-green to white calc-silicate generally as thin (<20 cm) layers and nodules/concretions/boudins; contains up to 25% diopside; up to 25% amphibole(prismatic; locally with psammite and semipelite layers; marble±calc-silicate <2 m wide denoted by turquoise line labeled Pc_m.

Par_m — **Limy arenite**: immature quartz-rich clastic rocks characterized by 5–15% pale green diopside±tremolite, an indication of metamorphosed limy component, also commonly containing <3% muscovite and graphite; occurs as cm- to m-thick layers, associated with quartzite.

Pqz_m — **Orthoquartzite**: pale grey, blue-grey to white-weathering, equigranular, fine- to medium-sand size orthoquartzite; typically massive and thickly bedded, with no recognizable primary structures; elsewhere on Cumberland Peninsula, this unit averages 5–20 m and thickens to 400 m at the "type" Kingnait exposure on the southeast shore of Kingnait Fiord, may contain up to 2% pale pink garnet and <5% biotite; locally interbedded with psammite and semipelite.

PALEOPROTEROZOIC / ARCHEAN (undetermined age)

PRE- to SYN-TECTONIC PLUTONIC ROCKS

PAgd — **Granodiorite**: light grey weathered, medium-grained biotite±orthopyroxene±garnet granodiorite to monzogranite; variably foliated to mylonitic, locally K-feldspar porphyritic or porphyroclastic; commonly cut by monzogranite±charnockitic veins.

PAtn — **Tonalite**: light grey to white weathering, weakly to moderately foliated homogeneous biotite tonalite.

PAgb — **Gabbro**: black, dark grey to brown weathering, fine- to medium-grained, variably foliated non-magnetic gabbro typically with colour index between 60 and 85 occurring as 1–5 m wide layers, up to 20 m wide; mafics consist dominantly of hornblende (45-85%), biotite (up to 20%), locally clinopyroxene (5–10%), and 1–2% visible titanite; locally medium grey-green weathering gabbro contains bolb orthopyroxene (opx) and clinopyroxene (cpx), continuous mafic layers <2 m wide are denoted by a blue line labeled PAgb.

PAdr — **Diorite - quartz diorite**: medium green-grey (diorite) to light grey (quartz diorite) variably foliated, diorite has colour index of 45–60 with either hornblende or biotite as dominant mafic mineral and minor clinopyroxene; quartz rock with colour index of 30–40 and typically hornblende + biotite with 5–20% quartz, non-magnetic.

ARCHEAN ca. 2.71–2.99 Ga

PRE- to SYN-TECTONIC PLUTONIC ROCKS

Agd — **Granodiorite**: light grey weathered, medium-grained orthopyroxene±garnet granodiorite to monzogranite; typically weakly foliated and equigranular, locally K-feldspar porphyritic; commonly cut by monzogranite±charnockite veins (Amz); yields a U-Pb age of ca. 2.77 Ga west of Exeluk Fiord (CGM 3).

Amz — **Orthopyroxene monzogranite**: K-feldspar porphyritic, orthopyroxene-monzogranite, moderately foliated; occurring as xenoliths in unit Agd; yields a U-Pb age of ca. 2.77 Ga on Exeluk Fiord (CGM 3).

Atn — **Tonalite-granodiorite**: variably foliated, fine- to medium-grained biotite tonalite±granodiorite; typically cut by mm- to cm-wide veins of medium- to coarse-grained quartz diorite, monzogranite and trondjemite and typically containing xenoliths of diorite and quartz diorite; locally of homogeneous tonalite composition; yields ages of ca. 2.78 Ga at the head of Kumlien Fiord (CGM 1).

Atg — **Tonalite gneiss**: compositionally layered orthogneiss dominated by tonalitic agmatite±diorite phases interlayered with diorite, quartz diorite and by abundant hornblende-bearing inclusions of more mafic composition, possibly of related (cognate) origin.

PRE- to SYN-TECTONIC PLUTONIC ROCKS

Ptn — **Tonalite**: light grey to white weathering, variably foliated homogeneous biotite tonalite±hornblende±granodiorite; locally containing xenoliths of marble (P_m) and semipelite (PAp$_s$).

QIKIQTARJUAQ PLUTONIC SUITE ca. 1.88–1.9 Ga

Pgd — **Granodiorite-monzogranite**: weakly foliated, light grey to beige-weathering, medium-grained, equigranular biotite±magnetite-garnet±orthopyroxene granodiorite-monzogranite; 3% burgundy garnet typically as aggregates; may be K-feldspar or quartz porphyritic; patchy granulite-facies assemblages and colouration.

Pgb — **Gabbro-dioritegabbro±anorthosite**: black, dark grey to brown weathering, fine- to medium-grained, variably foliated gabbro±anorthosite with colour index of 60 to 85 and mafics dominantly as hornblende (40–60%), biotite (up to 20%), with minor clinopyroxene (5–10%) and 1–2% visible titanite; locally contains bolb leucogabbro to gabbroic anorthosite (*i.e. mafic complex east of Ujukuk Fiord*) occurring as layers, enclaves and xenoliths in plutonic rocks either known, or presumed, to be of Archean age.

SUPRACRUSTAL ROCKS

Asp — **Semipelite**: occurs as panels, layers and inclusions, average 20–50 m wide, within foliated to gneissic tonalite; typically brown-weathering, biotite-garnet±sillimanite-agraphite semipelite, may be interlayered with garnet-rich (>60%) "garnetite" layers, 20–40 cm wide; amphibolite 1–4 m wide; and/or pale grey chert, "gp" denotes graphite-rich unit.

Amv — **Mafic volcanic rocks**: dark green weathering, pillowed flow with brown-weathering vesicles and sparse 1 cm plagioclase phenocrysts; overlain by limy arenite and cut by quartz porphyry dated at ca. 2.91 Ga; restricted exposure in CGM 1 northeast of the head of Akliujartuvak Fiord; may also include amphibolite associated with Agp.

Lithological contact
Observed
Approximate
Inferred
Limit of mapping

Structural form line

Faults
Thrust, teeth on upthrown side
Inferred thrust, teeth on inferred upthrown side
Inclined, normal, may be reactivated thrust fault
Vertical, normal
Ductile shear zone, sense of shear unknown
Linear aeromagnetic anomaly
Positive
Negative
Axial trace of first generation (F_1) synform
Upright
Overturned, north-dipping limbs
Axial trace of second generation (F_2) antiform, synform
Upright
Overturned, north-dipping limbs
Axial trace of third generation (F_3) antiform, synform
Bedrock outcrop examined for this study
Gossans
Mineral showings*

Bedding
Inclined, facing known, facing unknown
Overturned, facing known (NW)
Igneous layering, inclined, tops unknown
S_0=S_1, transposed
Cleavage
Inclined, first generation
Inclined, second generation
Schistosity
Schistosity, first generation, inclined, vertical
Schistosity, second generation, inclined, vertical
Schistosity, third generation, inclined, vertical
Gneissosity
Gneissosity, first generation, inclined, vertical
Gneissosity, second generation, inclined
Ductile shear zone
Shear zone with dip
Mineral lineation
Intersection lineation, S_0-S_1
Intersection lineation, S_1-S_2
Mineral, stretching, first generation
Mineral, stretching, second generation
Mineral, stretching, third generation
Regional extension (direction and plunge indicated)

Folds**
S folds, first generation, showing dip of axial plane and plunge of fold axis
S fold, second generation, showing dip of axial plane and plunge of fold axis
S fold, third generation, showing dip of axial plane and plunge of fold axis
U fold, first generation, showing dip of axial plane and plunge of fold axis
U fold, second generation, showing dip of axial plane and plunge of fold axis
U fold, third generation, showing dip of axial plane and plunge of fold axis
U fold, unknown generation, showing dip of axial plane and plunge of fold axis
Z fold, first generation, showing dip of axial plane and plunge of fold axis
Z fold, second generation, showing dip of axial plane and plunge of fold axis
Z fold, unknown generation, showing dip of axial plane and plunge of fold axis
**Fold axis may occur without axial plane.

Dyke, vein
Dyke
Dyke, sill
Vein, inclined, vertical
Prominent joint, vertical

Observation from air; number corresponds to jpeg photo image (see \Data\FieldReports\Photos)

Preliminary publications in this series have not been scientifically edited.

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CANADIAN GEOSCIENCE MAP 4
GEOLOGY
PANGNIRTUNG FIORD
Baffin Island, Nunavut