

Introduction
The Whitehills-Tehek Lakes area is located in the District of Keewatin north of Baker Lake. The area was chosen for study in order to provide a geological map of an area partially mapped by several previous geological surveys...

Location and Access
The south margin of the Whitehills-Tehek map area is 25 km north of Baker Lake village, which is served by regular scheduled air service from Baker Lake. Baker Lake is accessible by air from Hudson Bay and Churchill...

Previous Work
The Whitehills-Tehek area comprises part of the central Keewatin region mapped in the 1950's by Wright (1952, 1957), Geological mapping at 1:250 000 scale in the western part of the Whitehills-Tehek area was done by Davidson (1965, 1968), Woodburn Lake, NTS 6616, and in the east by Sifton (1965, 1970, 1975), Precambrian geological mapping at 1:250 000 scale that overlaps study or in part with the present map was done by Taylor (1965, 1975, 1980), and Anderson (1981, 1982, 1983), in addition, Anderson (1981) mapped NTS 6612.

General Geology
Whitehills-Tehek area is located within a region composed mainly of deformed Archean supracrustal rocks of the Woodburn Lake group (Ashlin, 1981, 1982, 1983). These rocks have been metamorphosed to middle greenschist facies, and are intruded by Late Archean granitic batholiths. U-Pb geochronology on zircon indicates that early metasedimentary rocks occurring near the Woodburn Lake group (Hodder et al., 1992) are 2770 Ma (Hodder et al., 1992). Near Amarak Lake, 20 km northwest of the map area, U-Pb zircon ages indicate that the Woodburn Lake group (Hodder et al., 1992) is 2770 Ma (Hodder et al., 1992). The Woodburn Lake group is a complex of rocks with a variety of lithologies and grades of metamorphism. It is composed of mafic and ultramafic rocks, gabbros, and mafic dykes. The Woodburn Lake group is overlain by a sequence of rocks including quartzite and quartz-muscovite schist. A thick unit of massive quartzite and quartz-muscovite schist overlies the mafic and ultramafic rocks. The quartzite and quartz-muscovite schist is overlain by a sequence of rocks including mafic and ultramafic rocks, gabbros, and mafic dykes. The Woodburn Lake group is overlain by a sequence of rocks including quartzite and quartz-muscovite schist. A thick unit of massive quartzite and quartz-muscovite schist overlies the mafic and ultramafic rocks. The quartzite and quartz-muscovite schist is overlain by a sequence of rocks including mafic and ultramafic rocks, gabbros, and mafic dykes.

Stratigraphy of Woodburn Lake group
Stratigraphic succession in the Woodburn Lake group is uncertain because few younging indicators were found. The bedding measurements made from the mafic and ultramafic rocks and a sequence of mafic and ultramafic rocks are not observed. Taylor (1965) considered the structural sequence in the Whitehills-Tehek area to comprise a lower polydeformed sequence, a thin sequence of mafic and ultramafic rocks, a mafic and ultramafic sequence, mafic and ultramafic rocks, gabbros, quartzite, and gneiss. Fraser (1988) concluded that in the Woodburn Lake area, the Woodburn Lake group was composed of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss.

East and south of Amarak Lake, Late Archean granitic rocks intrude the Woodburn Lake group and obscure the basement sequence, but to the north of Amarak Lake and south of Third Portage Lake, intermediate metamorphic and volcanoclastic rocks are overlain by mafic and ultramafic rocks, gabbros, quartzite, and gneiss. Intermediate metamorphic and volcanoclastic rocks to the north of the mafic and ultramafic rocks are interpreted to be related to the north side of a large extensional basin. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss.

Intermediate volcanoclastic and volcanoclastic rocks
Massive fine-grained gray mafic andesite and very poorly bedded andesitic volcanoclastic rocks characterize the unit, which dominates the area around Amarak Lake, and to the north in the Third Portage Lake area. U-Pb zircon dating indicates a time of ca. 2770 Ma (Hodder et al., 1992).

Metagabbro, gabbro and mafic rocks
Metagabbro is a coarse-grained, dark-colored mafic rock. It is composed of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss.

Bedded iron formation
Magnetic iron formation (MIF) is black, fine-grained, and composed of iron-rich magnetite and quartzite beds. It occurs as lenses within intermediate volcanoclastic rocks and metagabbro south of Third Portage Lake. In and around Third Portage Lake MIF is generally associated with metasedimentary rocks, which form several regionally extensive horizons. Where pyrite and/or pyritic occur, MIF may be surficial in the Third Portage Lake area (Barham & Murty, 1985).

Metaschist, ultramafic schist and marble
A thin, mafic, mafic layer of mafic-textured hornfelsite occurs between MIF and pillow basalt about five km north of Whitehills Lake. This mafic-textured hornfelsite is associated with Taylor (1965, p. 8). Northwest of the Whitehills-Tehek area, mafic-textured hornfelsite occurs between MIF and pillow basalt about five km north of Whitehills Lake. This mafic-textured hornfelsite is associated with Taylor (1965, p. 8). Northwest of the Whitehills-Tehek area, mafic-textured hornfelsite occurs between MIF and pillow basalt about five km north of Whitehills Lake. This mafic-textured hornfelsite is associated with Taylor (1965, p. 8).

Pillow basalt, gneissite
Pillow basalt overlies mafic and ultramafic rocks, metagabbro and quartzite. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss.

Polymictic conglomerate along the northwestern shore of Whitehills Lake (Taylor, 1965). It is characterized by well-sorted pebbles and boulders of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss.

Quartzite and muscovite schist
Massive, white to gray, medium-grained, poorly bedded quartzite, muscovite quartzite and quartz-muscovite schist overlie mafic and ultramafic rocks, metagabbro and quartzite. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss. The mafic and ultramafic rocks are overlain by a sequence of mafic and ultramafic rocks, gabbros, quartzite, and gneiss.

Quartzite and muscovite schist
Felsic porphyry is a distinctive white to pink-orange weathering, massive volcanic rock. It occurs at several apparent stratigraphic horizons within the Woodburn Lake group. A large mass overlies quartzite and underlies mafic and ultramafic rocks north of Whitehills Lake, and in the north of the area several mafic porphyries occur with intermediate and ultramafic volcanic rocks, as well as quartzite. In Third Portage Lake several small bodies of quartzite porphyry occur on islands.

Metagabbro
Massive, coarse-grained, unfoliated hornfelsite gabbro occurs as small plutons in the area of Third Portage Lake.

Granitic rocks
Coarse grained, pale weathering biotite and biotite-hornfelsite granitic batholiths surround and intrude Woodburn Lake. Coarse-grained mafic and ultramafic rocks and mafic dykes occur in the mafic and ultramafic rocks. Batholiths intrude late in the deformation history of the group, and are generally unfoliated to weakly foliated. Granitic rocks show on the map as late Archean granites. Unfoliated granitic batholiths occur in the mafic and ultramafic rocks, as well as quartzite. In Third Portage Lake several small bodies of quartzite porphyry occur on islands.

Syncline
Numerous plutons of granite crop out on several islands in Whitehills Lake, and have been described and assigned to the post-Hudsonian Proterozoic Metasedimentary Suite by Taylor (1965). East of the map area, Anderson (1981) mapped numerous post-tectonic granitic plutons intruding the Archean granite. Taylor (1965) shows numerous small igneous dykes in the Halfway Hills area that are too small to portray on the present map.

Dykes
Several diabase dykes form east-west trending magnetic anomalies between Amarak and Whitehills Lakes. The dykes are probably the youngest rocks in the Whitehills-Tehek area, but they have not been dated or assigned to any recognized group.

Structural fabric elements recorded in the field are bedding, mineral foliation (S₁), mineral lineation (L₁), extensional cleavage (S₂), and contraction fracture (F₁). Bedding attitudes were difficult to obtain due to the strong overprint of S₁, which is considered parallel to bedding in rocks where both structures were observed, as well as a general absence of well-bedded rocks. Muscovite (F₁) folds are common, and axial planes and axes were recorded.

Metamorphism
Metamorphic conditions in the field are low greenschist to lower amphibolite grade. In Whitehills, Baker Lake, and in the extensional basin, amphibolite grade and amphibolite facies conditions occur. Metasedimentary rocks contain actinolite, chlorite, glaucofan, ultramylonite, and amphibolite facies conditions are unobscured or altered to chlorite, kaolinite, and muscovite. Quartz and muscovite are common in quartzite, but north of Third Portage Lake, actinolite and chlorite are common. Late tectonic amphibolite facies conditions are not present in mafic and ultramafic rocks. Amphibolite facies conditions are present in mafic and ultramafic rocks in the range 270-280°C and pressures above 2.3 kbar.

Economic Geology
Gold occurrences are spatially associated with pyrite-bearing mafic and ultramafic rocks in the Third Portage Lake area. Extensive prospecting has been carried out in the region, and the most promising exploration target found is indicated on Third Portage Lake, where diamond drilling has been done (Barham & Murty, 1985).

Acknowledgments
Marvella Henderson, Lynn Pryor and Richard Crosswell shared responsibility in the mapping. We gratefully acknowledge Corinne Munn and W.A. Hildebrandt for assistance in the field with geological and geophysical data in the Third Portage Lake area. Discussions in the field with Phil Murty, Sandy Barham, Mark Sifton, and Tony Higgins on the geology of the Third Portage Tehek area were much appreciated. John Brown provided numerous versions of the high-resolution aeromagnetic data. Robin Wylie digitized the geological map. The project was partially funded under the Federal/Alberta Mineral Development Agreement 1987-1991. A.K. LeComte kindly edited the map.

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Figure 2. Major structures of the Woodburn Lake group in the Whitehills-Tehek area (after Henderson, et al., 1991; Taylor, 1965; Nadeau, 1981; Anderson, 1980, and J.R. Henderson, unpublished). Bedding-parallel mineral foliation (S₁) is the most common structural element, and reveals a north-vergent F₁ system in the southwest, an upright dome around Amarak Lake, and north-vergent antiform north of Third Portage Lake. These folds are defined by north-northeast-trending upright folds south of Whitehills Lake and at Third Portage Lake.

Figure 1. Geological map of the region northwest of Hudson Bay showing the distribution of major Proterozoic supracrustal rocks in the area. The Whitehills-Tehek area is centered about 50 km north-northeast of Baker Lake village between the letters W&C.

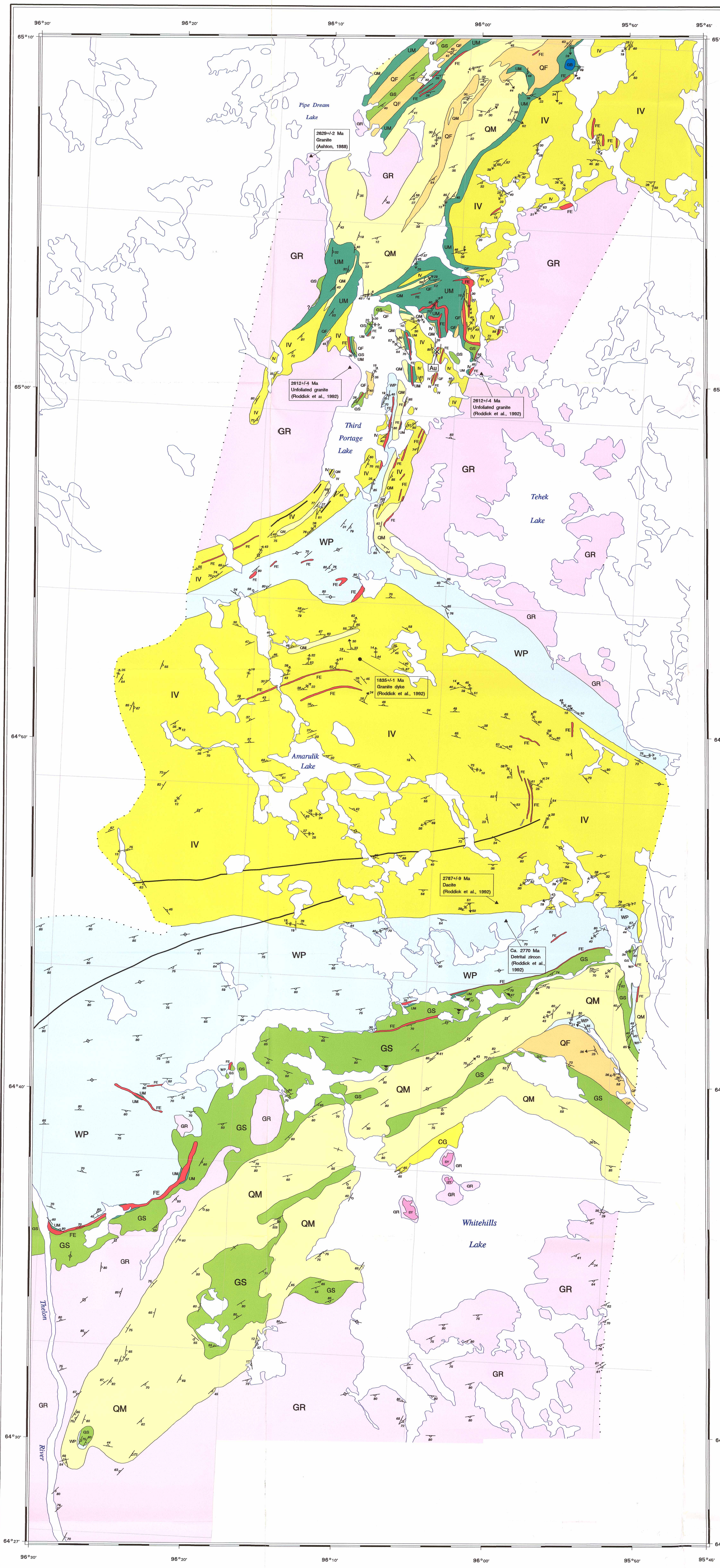
Geological boundary (defined under approximate)
Line of mapping
Bedding (bedrock), vertical, younging down, overturned
Foliation (bedrock), vertical, younging down, overturned
L₁ mineral lineation (bedrock), vertical
Intersection lineation of bedding and S₁ (bedrock), right vergent
S₂ contraction cleavage (bedrock), and S₁ g₁ (bedrock), right vergent
Intersection lineation of S₂ and S₁ g₁ (bedrock), right vergent
Locally where radiometric age (Ma) has been determined (U-Pb method)
Igneous zircon
Metallic prospect (Third Portage Lake Gold Deposit)

Geology by J.R. Henderson, M.N. Henderson, L.L. Pryor and R.G. Crosswell 1982; additional data from F.C. Taylor (1965), Geological Survey of Canada
Map compilation by J.R. Henderson
Digital cartography by J. Dohar, Geological Survey of Canada
Ethnographic plot produced by the Geological Survey of Canada
Any additions or additional information known to the user would be welcomed by the Geological Survey of Canada
Base map produced by the Geological Survey of Canada
Copies of the topographic editions covering this map area may be obtained from the Canada Map Office, Natural Resources Canada, Ottawa, Ontario, K1A 0S8
The proximity of the North Magnetic Pole causes the magnetic compass to be erratic in this area. Mean magnetic declination 1984, 2°05' W, increasing 2.4° annually. Readings vary from 0°25' E in the SW corner to 2°17' W in the NE corner of the map.
Scale 1:100 000 - Echelle 1/100 000
Kilometres / Kilomètres
Transverse Mercator Projection / Projection Transverse de Mercator
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GEOLOGY
WHITEHILLS - TEHEK LAKES AREA
DISTRICT OF KEEWATIN
NORTHWEST TERRITORIES
Scale 1:100 000 - Echelle 1/100 000
Kilometres / Kilomètres
Transverse Mercator Projection / Projection Transverse de Mercator
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2923
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
OTTAWA
02/1995

Recommended citation:
Henderson, J.R. and Henderson, M.N., 1984. Geology of the Whitehills - Tehek Lakes Area, District of Keewatin, Northwest Territories, Geological Survey of Canada, Open File 2923, scale 1:100 000.

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LEGEND
PROTEROZOIC
SY Dyonite
ARCHEAN
GR Granitic rocks
GS Metagabbro
WOODBURN LAKE GROUP (not in stratigraphic order)
OF Quartz-felsic porphyry
OM Quartzite and muscovite schist
CG Polymictic conglomerate
GS Pillow basalt and gneissite
WP Metagabbro, gabbro and mafic rocks
UM Metamorphic, ultramafic schist and marble
FE Bedded iron formation
IV Intermediate volcanic and volcanoclastic rocks
Geological boundary (defined under approximate)
Line of mapping
Bedding (bedrock), vertical, younging down, overturned
Foliation (bedrock), vertical, younging down, overturned
L1 mineral lineation (bedrock), vertical
Intersection lineation of bedding and S1 (bedrock), right vergent
S2 contraction cleavage (bedrock), and S1 g1 (bedrock), right vergent
Intersection lineation of S2 and S1 g1 (bedrock), right vergent
Locally where radiometric age (Ma) has been determined (U-Pb method)
Igneous zircon
Metallic prospect (Third Portage Lake Gold Deposit)

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