

### LEGEND

**MESOPROTEROZOIC**

- PM: MACKENZIE DYKES: diabase, gabbro; northerly trend; pronounced aeromagnetic expression; solid segment, dyke observed in outcrop or apparent from airphotos; dashed segment, dyke inferred from aeromagnetic expression.

**PALEOPROTEROZOIC**

- PI: MIDN DYKES: diabase, gabbro; northeasterly and northwesterly trend; unaltered to weakly metamorphosed (chlorite-actinolite-epidote) with northwesterly trending dykes typically more abundant; cordilleran crosscutting relationships; weak aeromagnetic expression; abundant throughout area (only a few more prominent examples shown on map); solid segment, dyke observed in outcrop or apparent from airphotos; dashed segment, dyke inferred from aeromagnetic expression.

**ARCHEAN**

- AG: Granitoid rocks of the Ghost domain, undivided at any given location the unit consists of varied proportions of many of the granitoid units described below as well as mesometamorphic migmatite and diatexite at a scale that can not be resolved at the present scale of mapping. It is similar undivided granitoid rocks at granulite grade.
- AG.o: Granitoid rocks of the Dauphinee domain, undivided; granite, granodiorite, and minor tonalite; pink to white, medium- to coarse-grained, commonly sparsely megacrystic; massive and typically homogeneous on local scale; contains moderate to minor amounts of biotite. The unit is extensively altered and fractured toward western domain boundary.
- AYS-g-f: Mixed granitoid rocks and Yellowknife Supergroup metasedimentary migmatite bodies in complex or less equal proportions, but too small to be resolved on the map; granitoid rocks consist largely of pink granite, granodiorite (unit Ag), and tonalite (unit At).
- Ag: Granite, granodiorite; fine-grained, pink to greyish pink; medium- to coarse-grained; inequigranular; generally massive, but locally foliated; contains varied amounts of biotite; locally contains veins of leucocratic granite to pegmatite and inclusions of mainly mesometamorphic rocks; U-Pb (zircon) age 2593 ± 4 Ma. Ag.o: Granite, granodiorite; yellow to greenish brown to brown; medium- to coarse-grained; inequigranular; locally foliated; contains moderate to minor amounts of biotite; orthopyroxene-orthopyroxene-biotite-bearing; locally large inclusions of tonalite (unit At.o); U-Pb (zircon) age 2589 ± 1 ± 2 Ma.
- Agm.o: Syenogranite; pink, coarse-grained, coarsely megacrystic with microcline crystals up to 8 cm; massive; biotite abundant with orthopyroxene in the southwesterly body; orthopyroxene or its altered equivalents more abundant in the northeastern body; minor garnet near contact with metasedimentary rocks, particularly in smaller intrusions; U-Pb (zircon) age 2592 ± 2 Ma; U-Pb (monazite) age 2589 ± 2 Ma.
- Agd: Granodiorite, tonalite; white to grey; medium- to coarse-grained; commonly contains megacrysts of microcline and/or plagioclase; weakly to moderately foliated; contains moderate to abundant biotite and minor or trace amounts of muscovite; mesometamorphic inclusions, and less commonly diorite to quartz diorite inclusions locally abundant.
- Aqd: Quartz diorite, diorite; medium grey; medium-grained and locally weakly inequigranular; generally weakly to moderately foliated; hornblende, biotite, and less commonly orthopyroxene and/or amphibole; recrystallized metasedimentary rocks particularly west of Ghost Lake; U-Pb (zircon) age 2605 ± 3 Ma.
- Amg: Metagabbro, ilucogabbro; dark green to black to grey; originally medium- to coarse-grained; now fine-grained; recrystallized; contains moderate to abundant massive to locally weakly to moderately foliated; hornblende to actinolitic amphibole and plagioclase with minor quartz in more leucocratic varieties; Metagabbro occurs both as the plutonic complex in the central part of the Yellowknife Supergroup intermediate to felsic volcanic complex and as numerous thin dykes that occur throughout much of the volcanic complex and less distinct in the metasedimentary rocks to the north. The dykes are particularly abundant south and east of the metamorphosed mafic pluton.
- Aam: Amphibolite; dark green to black; medium- to fine-grained; contains assemblages of plagioclase, hornblende, biotite, orthopyroxene and/or amphibole; the amphibolite occurs most commonly as layers associated with the tonalite gneiss unit, but also occurs elsewhere in Ghost domain in relatively thin, unmapped layers.
- Aum: Metagabbro; dark green to black; medium- to coarse-grained, inequigranular, massive. The rock is now composed almost entirely of actinolite with relict orthopyroxene in the coarse-grained mafic pluton.
- At: Tonalite, granodiorite; divided into three subunits, each of which is further divided on the basis of the presence or absence of biotite.
  - At: Tonalite, white to grey; medium- to coarse-grained; commonly equigranular, but locally sparsely megacrystic; generally weakly to moderately foliated; locally massive; mafic content is varied in amount and proportion and includes abundant biotite, minor orthopyroxene, altered pyroxene, and locally minor hornblende.
  - At.o: Tonalite, granodiorite; yellow to greenish brown; medium- to coarse-grained; locally orthopyroxene, biotite, and less commonly orthopyroxene and hornblende; locally, particularly in northern metagabbro intrusions contains sparse K-feldspar megacrysts similar in most respects to unit At. Tonalite originally crystallized to some extent was recrystallized under granulite-grade conditions.
  - At.g: Tonalite gneiss; dominated by tonalite that is similar in most respects to tonalite unit At. It also contains granitic and granodioritic phases of which are texturally and compositionally layered due to greater deformation. Also present are amphibolite and metasedimentary rocks in a variety of bodies. A granodioritic phase ca. 2605 Ma, At.g.o. Tonalite gneiss, similar in most respects to unit At.g but at granulite grade, locally retrogressed, in most cases biotite, orthopyroxene, or altered orthopyroxene-bearing; U-Pb (zircon) age of between 2640 Ma and 2630 Ma and U-Pb (monazite) age of between 2590 Ma and 2600 Ma on a tonalite phase from one sample.
  - At.g.m: Granite, granodiorite, pink, medium- to coarse-grained to fine-grained; orthopyroxene and hornblende-bearing megacrystic present is highly varied resulting in rock compositions that grade from tonalite with no megacrysts to granite with abundant coarse megacrysts reminiscent of the megacrystic syenogranite (unit Agm.o). The compositional variations are typically gradational and in general the more densely megacrystic phases occur in the northern part of the unit.

**HINSLIFFE COMPLEX**

- AH: Trondhjemite, minor granodiorite and tonalite, rare pegmatite, and foliated to gneissic equivalents; pale grey to pinkish grey; fine, sugary recrystallized texture with original coarse-grained texture locally evident; locally minor compositional and textural variations; moderate to weak foliation defined by biotite, disrupted and partially recrystallized pegmatite, variably present; parallel layering and foliation; U-Pb (zircon) age 2614 ± 4 Ma. The least deformed rocks occur in the central part of the complex, south and southeast of Hinscliffe Lake. Throughout the complex, coarse-grained, orthopyroxene-bearing amphibolite inclusions are present that are thought to represent synplutonic mafic dykes. At both the north and south margins of the complex is a several hundred metre wide zone containing inclusions distinctly finer-grained on a centimetre scale with compositions varied between metadiorite and metagabbro. Rare, minimally deformed, late pegmatite and small granite veins to small stocks, possibly related to unit Ag, occur locally.

**YELLOWKNIFE SUPERGROUP**

- AYS.cd: Metasedimentary rocks with thin intercalations of metabasite and rare metagabbro; occurs mainly in thin bedded, but locally up to metre-scale, siltstone-dominated, graded couplets characteristic of turbidity current deposits; sedimentary rocks variably metamorphosed from greenschist grade to granulite grade as follows:
  - AYS.cd: siltstone zone.
  - AYS.cd: biotite zone.
  - AYS.cd: cordierite-andalusite zone.
  - AYS.cd: sillimanite zone.
  - AYS.si: migmatite zone.
  - AYS.m: garnet-bearing migmatite zone.
  - AYS.m: garnet-bearing migmatite zone.
  - AYS.m: orthopyroxene-bearing migmatite zone.
  - AYS.mo: orthopyroxene-bearing migmatite zone. The mafic volcanic rocks in the northwestern part of the subarea, the unit locally contains several metre thick, yellow-brown, fine-grained, greywacke-dominated units. Metre-scale, thin, layered siltstone non-formation units with layering defined by varied proportions of granule, hornblende, garnet, and recrystallized silica that are locally siltstone-bearing occur immediately west, southwest, and northeast of Cobson Lake. Thin metagabbro sills, thought to be related to unit Amg, are locally present in the northwestern part of the unit.
- AYS.mk: Metabasite, meta-andesite; dark green to dark grey-green; massive to strongly foliated; fine-grained chlorite-actinolite to hornblende-bearing. The mafic volcanic rocks consist of massive and less commonly pillowed flows and volcanoclastic units that are best preserved at and west of Wijinnedi Lake. Their more deformed and more highly metamorphosed equivalents occur to the east and south. Minor calcareous lenses occur locally at the contact between the metavolcanic and overlying metasedimentary rocks.
- AYS.vf: Metadiorite, minor meta-andesite and metagabbro; grey, grey-green, yellow-green, and pinkish grey; diorite sparsely kelyphitic and less commonly quartz-phyric; minor local zones of more mafic composition; mainly volcanoclastic breccia with less common volcanoclastic sandstone, extrusive flows, and shallow water bodies; U-Pb (zircon) age 2573.3 ± 1.4 Ma. The volcanic centre consists of mainly thick units of deformed, diorite-scale clasts with primary layering typically not apparent. Units of volcanoclastic sandstone are less common. The volcanic rocks are intruded by metagabbro dykes that are particularly abundant in the eastern and southeastern parts of the volcanic centre and are related to the central metagabbro plutonic complex (unit Amg). Less common are thin, subvertical, fine-grained, strongly recrystallized felsic sills in the southern part of the centre. AYS.vf.o: Migmatitic paragneiss; olive green to rusty brown; consists of finely interleaved, fine-grained metasedimentary and coarse-grained leucosome in both layers and anastomosing veins and wispy lenses; contains assemblages of orthopyroxene, orthopyroxene, biotite, and hornblende; locally grades into metasedimentary migmatite. This high metamorphic grade unit is considered to have been derived from an intermediate volcanic protolith.

Geology by F.G. Smith, 1939, G.M. Wright, 1949, J.B. Henderson, 1992-1993, S.E. Schwan, 1992

Geological compilation by J.B. Henderson, 1997 and 2000

Digital cartography by M. Proulx, Earth Sciences Sector Information Division (ESS Info)

This map was produced from processes that conform to the ESS Info Publishing Services Subdivision Quality Management System, registered to the ISO 9001:2000 standard

MAP 2023A  
GEOLOGY  
WIJINNEDI LAKE AREA  
NORTHWEST TERRITORIES

Scale 1:50 000 / Échelle 1/50 000

Universal Transverse Mercator Projection  
North American Datum 1927

Projection transverse universelle de Mercator  
Système de référence géodésique nord-américain, 1927

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

Digital base map from data compiled by Geomatics Canada, modified by ESS Info

Some geographical names subject to revision

Mean magnetic declination 2003, 24°28'E, decreasing 25.9' annually

85-04	85-03	85-02
85-013	85-014 2023A	85-015
85-012	85-011	85-010

NATIONAL TOPOGRAPHIC SYSTEM REFERENCE

Recommended citation:  
Henderson, J.B., 2003: Geology, Wijinnedi Lake area, Northwest Territories; Geological Survey of Canada, Map 2023A, scale 1:50 000.

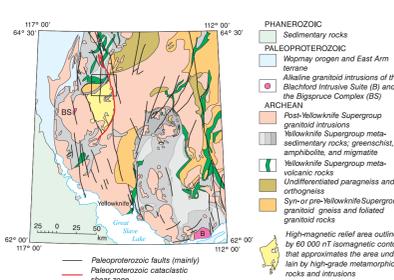


Figure 1. Geology of the southwest Slave Province showing the location of the Wijinnedi Lake map area at the boundary between an area to the south of Archaean high-grade metamorphic rocks and granitoid intrusions, in large part at granulite grade, and, to the north, lower metamorphic grade rocks, both of which are part of a major Paleoproterozoic uplift.

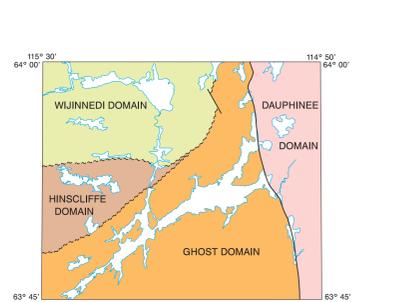


Figure 2. The map area is divided into four domains of which the western three represent successively deeper structural levels. They are bounded by Archaean shear zones in the ambient metamorphic grade that have juxtaposed the domains to their present relative positions. The Wijinnedi domain is dominated by relatively low-grade Yellowknife Supergroup supracrustal rocks that rise to upper amphibolite grade to the east. The Hinscliffe domain consists of a metamorphosed rhyolitic granodioritic igneous complex. The Ghost domain is made up of banded granitoid rocks, granitoid intrusions, and Yellowknife Supergroup supracrustal rocks most of which were metamorphosed at or crystallized under granulite-grade conditions. The Dauphinee domain to the east consists largely of massive granitoid rocks with minor metasedimentary migmatite. It is separated from the Ghost domain by a low metamorphic grade, cataclastic shear zone across which the three domains to the west were uplifted during the Paleoproterozoic.