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LEGEND

QUATERNARY

Q — *Sand and gravel*

MIDDLE PROTEROZOIC
approximately 1270 Ma

MACKENZIE DYKES: NW-trending diabase dykes

EARLY PROTEROZOIC
approximately 1720 Ma
DUBAWNT SUPERGROUP - BARRENSLAND GROUP

Xu — *KUUNGMI FORMATION: dark grey to grey-green weathering aphanitic high-K volcanic flows resembling basalts, and hematite-rich sandstones*

Xt — *THELON FORMATION: basal othoconglomerate with kaolinite cement, overlain by sandstone and stratified pebble conglomerate; unconformably overlies Wharton Group*

approximately 1740 Ma
DUBAWNT SUPERGROUP - WHARTON GROUP

Xpv — *PITZ FORMATION: purple-red weathering, porphyritic rhyodacite to rhyolite flows; rhollte frequently with euhedral quartz phenocrysts; has a prominate saprolite surface below Xt*

Xps — *Conglomerate, sandstone, and travertine*

Xpr — *Fluorite-bearing granite with quartz, phenocrysts; intrusive equivalent of Xpv, frequently rapkivi-textured; chilled margins and dikes; U-Pb age 1740-1760 Ma*

approximately 1840 Ma
DUBAWNT SUPERGROUP - BAKER LAKE GROUP

Xk — *KUNWAK FORMATION: stratified and cross-bedded pebble conglomerate, sandstone and siltstone, brick-red weathering; also nonsorted, clast-supported boulders and breccia*

Xcva — *CHRISTOPHER ISLAND FORMATION: grey-weathering, aphanitic intemediate to felsic minette flows; vesicles filled with quartz, epidote, and feldspar commonly concentrated in upper third of flows 2-5m thick*

Xcsl — *Cream to grey-weathering, silty lacustrine sediments; beds massive and featureless to cross-bedded and laminated on cm scale with selective replacement by epidote*

Xcs — *Conglomerate and sandstone derived from minette volcanic rocks; poorly sorted with well-rounded clasts; minor Archean pebbles occur in strata above Xcva*

Xcvm — *Purple to brown-weathering mafic minette flows and pyroclastic rocks with sedimentary interbeds; phlogopite, clinopyroxene and olivine phenocrysts*

Xcvf — *Grey-pink weathering felsic minette flows; siliceous with sparse phlogopite and opx phenocrysts in an aphanitic matrix; rare sanidine porphyries*

Xcv — *Undifferentiated minette volcanic and volcaniclastic rocks*

Xcb — *Basal sedimentary unit, unconformably overlying older rocks; conglomerate with angular granitoid clasts at base fining upwards to pebbly sandstone; minette content in clasts and matrix increases upward*

approximately 2100 Ma

Xa — *Amer Group; orthoquartzite with minor semipelitic bands*

ARCHEAN

Al — *Leucogranite, medium to fine-grained, usually biotite-bearing*

Am — *Megacrystic granite, granodiorite and monzonite; kspar phenocryst to 6 cm; usually hornblende-bearing with minor biotite; U-Pb age 2605 Ma*

Ad — *Diorite and gabbro, medium-grained; plagioclase with pyroxene, amphibole, and biotite*

Agd — *Hornblende granodiorite; medium-grained rock with equal amounts of hornblende, white plagioclase, and pink kspar is characteristic*

Ap — *Coarse-grained biotite peridotite; phlogopite, chromite, olivine, and orthopyroxene phenocrysts; fresh olivine remnants*

Ag — *Foliated ortho- and paragneisses intruded by younger calc-alkaline plutons; mainly greenstone assemblages with amphibolite, and iron formation; migmatized and highly deformed at contacts with younger intrusions*

A — *Undifferentiated Archean gneisses; probably mainly intrusions at 2600-2610 Ma*

Lithological contact (defined, approximate, assumed)
Bedding 30
Mineral foliation (first, second occurrence) 63 / 75
Mineral lineation (first, second occurrence) 50 / 37
Minette dike
Glacial ice direction
Fault, type unknown
Normal fault (solid circle indicates downdropped side)
Depositional escarpment
U-Pb (zircon) age determination, millions of years

DESCRIPTIVE NOTES

Dubawnt Lake is situated on the eastern margin of the Thelon Basin, the largest remnant of the Thelon Formation sandstone (1.72 Ga: Miller et al., 1988) which probably extended as far west as Hudson Bay and may have been correlative, or even co-extensive, with the Athabasca Basin. The lake itself covers a complex of Early Proterozoic basins of the Baker Lake Group (1.84 Ga), which in this area comprises the Christopher Island Formation (volcanic/sedimentary) and the Kunwak Formation (sedimentary). Geological contacts in the SE corner of the map area, which was not mapped in this study, are from Tella and Eade (1985).

Archean rocks in the area consist of ca. 2.6 Ga granite-to-diorite plutons, with minor peridotite, that intruded older (but undated) gabbroic to tonalitic and semipelitic gneisses which are presumed to be correlative with late Archean greenstone bodies in the eastern District of Keewatin (e.g., Ennedai -Rankin).These older gneisses were metamorphosed at middle to upper amphibolite facies before the intrusion of the plutonic suite, and were extensively migmatized by those plutons. Deposition of quartzites of the ca. 2.1 Ga Amer Group preceded metamorphism at middle greenschist to lower amphibolite facies; metamorphism accompanied formation of a strong, shallowly SE-plunging lineation and mylonite bands. Synkinematic pegmatites from the mylonites talled to yield datable phases, however, the time constraints (post-2.1 Ga,nt-1.84 Ga) suggest correlation with ductile deformation in the Thelon tectonic zone, which likely represents docking of the Slave Province to the Churchill Province at about 1.9 Ga (Hoffman, 1988).

Later brittle faulting in the Thelon tectonic zone, which probably resulted from a microcontinental collision on the western margin of the Slave Province at 1.84 Ga (Villeneuve et al., 1991), correlates with the formation of Baker Lake Group basins in the Dubawnt Lake area. The geometry and kinematics of faults bounding the triangular basin in the SE quadrant of the map area are strikingly similar to the conjugate Macdonald/Bathurst system bounding the eastern apex of the Slave Province: the basin deepens bruptly near the apex, consistent with E-W compression and N-S extension. A major NE-trending strike-slip fault separates strongly lineated basement rocks from Kunwak Formation alluvial fans in the NW quadrant; that fault system is right-lateral ut conjugate NW faults have sinistral kinematics, reinforcing the correlation with the Macdonald/Bathurst system. The volcanic rocks of the Christopher Island Formation, which include flows, several pyroclastic facies, and hypabyssal dikes, are ultrapotassic and include both primitive (>8% MgO) mafic minettes and differentiated felsic minettes with many similarites to lamproites. The composition of these igneous rocks reflects partial melting of a subcontinental mantle source region depleted by extraction of basaltic melts in the Archean, and then enriched by subduction processes during the early stages of the accretion of Laurentia. Basin formation, and feeder dike propagation, occurred in response to intracratonic deformation resulting from continental collisions on the margins of the growing supercontinent.

A hiatus of about 100 myr passed before emplacement of shallow anorogenic granites and eruption of rhyolites and rhyodacites of the Pitz Formation (Wharton Group) at about 1740 Ma, followed by deposition of the Thelon Formation (Barrensland Group) shortly afterward. Minor mafic flows above the Thelon Formation (Kuungmi Formation) are also strongly potassic, and compositionally very similar to the Christopher Island Formation.

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Geological compilation by Tony Peterson, 1992, based on geological mapping by T. Peterson, A. LeCheminant, R. Rainbird, B Kjarsgaard, and Q. Gall (1986-1991). Portions of 65K/14 and 65K/15 based on mapping by Tella and Eade (1985)

Digital map compilation by Tony Peterson,Geological Survey of Canada

Digital Cartography by R. L. Allard, Geological Survey of Canada, with assistance from V. Dohar, P. Huppé, G. Labelle and M. Méthot

Base map digitally assembled by the Geological Survey of Canada from digital maps supplied by the Topographic Mapping Division, Energy, Mines and Resources

Copies of the topographical editions covering this map area may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa, Ontario, K1A OE9

Magnetic declination 1992, 12°26´ East, decreasing 17.4´ annually. Readings vary from 10°37´ E in the SE corner to 14°05´ E in the NW corner of the the map

The daily change of the North Magnetic Pole causes the magnetic compass to be very erratic in this area

Grant Lake
Dubawnt River
Outlet Bay
Dubawnt Lake
District of Keewatin

GEOLOGICAL SURVEY OF CANADA — COMMISSION GÉOLOGIQUE DU CANADA

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GEOLOGY

DUBAWNT LAKE

DISTRICT OF KEEWATIN
NORTHWEST TERRITORIES

Scale 1:100 000 - Échelle 1/100 000

Kilometres 2 0 2 4 6 8 Kilometres

Transverse Mercator Projection
CM 101°15', Scale Factor 1

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GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
OTTAWA
1992

INDEX MAP - LIEU DE LA CARTE

65 N/8	65 N/9	65 N/10
65 N/5	65 N/6	65 N/7
65 N/4	65 N/3	65 N/2
65 K/13	65 K/14	65 K/15

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1992: Geology, Dubawnt Lake area, District of Keewatin, Northwest territories; Geological Survey of Canada, Map xxxxA, scale 1:100 000