- unsubdivided Archean -

⁴ sigmoidal pattern denotes orthogneiss

▲ Volcanic ■ Sedimentary Tectonometamorphism

felsic dyke, Rahill Bay

Table 3. Geochronological summary illustrating the age of major depositional, intrusive, and deformational events for the East Uchi map sheet. References to specified ages given in Table 1. Colours correspond to lithology and age as shown in Figure 4. Observed unconformities are denoted by line decorated with solid balls, as denoted on map face. Inferred unconformities, based on age of detritus in

tonalite,
Trout Lake batholith

vertical screen denotes dominant tholeiitic geochemical affinity, stipples screen denotes dominant calc-alkaline affinity, diagonal screen denotes

ap sheet presents the Archean geology of part of the Uchi Subprovince, which exposes two significan belts and intervening granitoid rocks. In the west, the Red Lake greenstone belt preserves a 300 m.v.

er assemblage (bm) ca. 2989-2964 Ma

Narrow Lake assemblage (nl) > 2870 Ma < 2975 Ma, ruce Channel assemblage (bc) ca. 2894 Ma

out Bay assemblage (tb) > ca. 2855 < ca. 2852 Ma tocks of the adjacent ball assemblage. The nomoclinal northeast-facing front bay and folded ball to the compact of the compact

small component of calc-alkaline andesitic to dacitic flows and tuffs that may correlate with the

uston assemblage (hu) > ca. 2732 Ma < ca. 2742

conformably overlie ca. 2.742 Ga Confederation assemblage (McNeely) rocks in central Red Lake (Parnell

St. Joseph assemblage (sj) ca. 2723 Ma

Intermediate tuff of the St. Joseph assemblage is recognized on Springpole Lake in the northeastern Birch-Uchi belt. These rocks are correlated with rocks in the Lake St. Joseph greenstone belt (Stott and Corfu, 1991) on the basis of a ca. 2723 Ma age (U-Pb #78; Table 1). They appear to lie unconformably above the Confederation assemblage, and likely postdate D. deformation.

ic rocks of Mesoarchean age are typically synvolcanic intrusive rocks of matic to ultramatic o

PLUTONIC ROCKS OF THE EAST UCHI SUBPROVINCE

East Uchi Subprovince map sheet

992c: Tectonic Assemblages of Ontario, west-central sheet, Ontario Geological Survey, Map 2576, scale 1:10

1977b: McDonough Township, Kenora District. Ontario Geological Survey, Preliminary Map, Geological Series, Map P1240, scale 1:12 000.

'8a: Balmer Township, District of Kenora. Ontario Geological Survey, Preliminary Map, Geological Series, Map 1978b: Bateman Township, Kenora District (Patricia Portion). Ontario Geological Survey, Preliminary Map, Geological Series, Map P1569-A, scale 1:12 000. a: Precambrian Geology of Corless Township, District of Kenora (Patricia Portion); Ontario Department of Mines and Northern Affairs Preliminary Map P634. Geological Series, scale 1:15.840 1971b: Geology of Knott Township, District of Kenora (Patricia Portion); Ontario Department of Mines and Northern Affairs Preliminary Map P.635. Geological Series scale 1:15.840 ** Tumeni River-Narrow Lake Area (Northeastern Part), District of Kenora (Patricia Portion); Ontario Div.

Preliminary Map P.901. Geological Series, scale 1:15,840. Shabumeni River-Narrow Lake Area (Northwestern Part), District of Kenora (Patricia Portion); Ontario Div. Mines, Preliminary Map P.973, Geological Series, scale 1:15 840.

Ar in hornblende, and about 275°C, the closure temperature for Ar in biotite. Within the Sydney Lake fault zone, younger argon ages for hornblende (ca. 2.54 Ga) and biotite (ca. 2.4–2.3 Ga) suggest a prolonged history of reactivation or fluid activity along this subprovince boundary fault.

1976:

Mulcahy Township, Kenora District; Ontario Department of Mines, Map Series 2000, Precambrian, Map 2295, scale 1:12 000.

1978a:

Todd Township, Kenora District. Ontario Geological Survey, 2000 Series, Precambrian Geology, Map 1978a: Todd Township, Kenora District. Ontario Geological Survey, 2000 Series, Precambrian Geology, Map 1978b: Fairlie Township, Kenora District. Ontario Geological Survey, 2000 Series, Precambrian Geology, Map

1975: Ball Township, Kenora District. Ontario Geological Survey, 2000 Series, Precambrian Geology, Map 2265, scale 1:12 000. 002: Geology, Confederation Lake, Ontario; Geological Survey of Canada, Open File 4265, scale 1:50 000. Recent advances in the geology and structure of the Confederation Lake region, northwestern Ontario. *in* Current Research 1999-C, Geological Survey of Canada, p. 187–195. Rogers, N., McNicoll, V., van Staal, C.R., and Tomlinson, K.Y. Lithogeochemical studies in the Uchi-Confederation greenstone belt, northwestern Ontario: implications for Archean tectonics; in Current Research 2000-C16, Geological Survey of Canada, 11p. Sanborn Barrie, M., Skulski, T., and Parker, J. in press: Geology of the Red Lake Greenstone belt, Ontario; Geological Survey of Canada, Open File 4594, scale 1:50 000. 2001: 300 m.y. of tectonic history recorded by the Red Lake greenstone belt, Ontario. in Current Research 2001-C19, Geological Survey of Canada, 14p. Sanborn-Barrie, M., Skulski T., Parker, J., and Dubé, B.

Integrated regional analysis of the Red Lake greenstone belt and its mineral deposits, western Superior Province, Ontario. *in* Current Research 2000-C18, Geological Survey of Canada, 16p.

2002: Geology and Tectonostratigraphic assemblages, western Wabigoon Subprovince, Ontario; Geological Survey of Canada, Open File 4255; Ontario Geological Survey, Preliminary Map P.3446, scale 1:250 000.

Sanborn-Barrie, M., Skulski, T., Percival, J.A., Whalen J.B., Brown, J., and McNicoll, V.

Beakhouse, G.P., Mainville, M.C., and Wilson, M.E.

Beakhouse, G.P., Heaman, L.M., and Creaser, R.A.

Corfu, F., Davis, D. W., Stone, D., and Moore, M.

Breaks, F.W., Bond, W.D., Stone, D., Harris, N., and Desnoyers, D.W.

1976b: Operation Kenora-Ear Falls, Papaonga-Wapesi Lakes Sheet, District of Kenora, Ontario Div. Mines Prelim. Map P.1200 Geol. Ser. scale 1:63 360.

1998a: Age structure and orogenic significance of the Berens River composite batholiths, western Superior Province. Can. J. Earth Sci. 35, 1089–1109.

93: Age and petrogenesis of two late Archean magmatic suites, northwestern Superior Province, Canada: Zircon U-Pb and Lu-Hf isotopic relations. Journal of Petrology 34, 817–838.

86: U-Pb zircon ages for magmatism in the Red Lake greenstone belt, northwestern Ontario. Can. J. Earth Sci. 23, 27–42.

U-Pb geochronology and evolution of the English River Subprovince, an Archean low P-high T metasedimentary belt in the Superior Province. Tectonics 14, 1220–1233.

Chronostratigraphic constraints on the genesis of Archean greenstone belts, northwestern Superior Province, Ontario, Canada. Precam. Res. 92, 277–295.

Provenance and depositional age constraints on sedimentation in the western Superior transect area from U-Pb ages of zircons; *in* 1996 Western Superior Transect Second Annual Workshop Lithoprobe Report #53, Lithoprobe Secretariat, University of British Columbia, p.18–23.

Workshop Lithoprobe Report #70, Lithoprobe Secretariat, University of British Columbia, p.55-65.

'2: Geology of the Goldcorp Inc. High-grade Zone, Red Lake Mine, Ontario: an update Current Research 2002-C26, Geological Survey of Canada, 13p.

92: Geology of the South Half of Bateman Township, District of Kenora. Ontario Department of Mines, Geological Report, no. 6 (Map 2016, scale 1:12 000). Toronto.

965: Geology of the Eastern Part of Baird Township, District of Kenora. Ontario Department of Mines, Geological Report, no. 39 (Map 2072, scale 1:12 000). Toronto.

1966: Geology of Dome Township, District of Kenora. Ontario Department of Mines, Geological Report, no. 45
(Man 2074, scale 1:12 000). Toronto.

986: Assessment of the Gold Potential in the Uchi-Confederation-Woman Lakes area: Preliminary Results;
Ontario Geological Survey Map P.2989 Mineral Deposits Series, scale 1:50 000.

Precambrian Geology of the Birch Lake area (eastern half), District of Kenora (Patricia Portion); Ontario Geological Survey Map P. 2964, scale 1:15 840.

Post-orogenic tectonothermal history of the Archean western Superior Province of the Canadian Shield as determined by conventional and laser Ar-Ar dating; in 1998 Western Superior Transect Fourth Annual Workshop, Lithoprobe Report #65, Lithoprobe Secretariat, University of British Columbia, p.12–16.

1945: Geology and mineral deposits of the Red Lake area. Forty-ninth annual report, Ontario Department of Mines, v. XLIX, pt. II, 231 pp. (includes Map 49a-West, Map 49b-East scale 1 in to ½ mile or 1:31 680).

Lesher, C.M., Goodwin, A.M., Campbell, I.H., and Gorton, M.P.

Litchblau, A., Storey, C.C., and Kosloski, L.

7: Nd isotopic evidence for Early to Late Archean (3.4–2.7 Ga) crustal growth in the western Superior Province (Ontario, Canada). Tectonophysics 322, 135–151.

Structural Signature and Tectonic History of Deformed Gold-bearing Rocks in northwestern Ontario. Ontario Geological Survey, Open File Report 5666, 113p.

Trace-element geochemistry of ore associated and barren, felsic metavolcanic rocks in the Superior Province, Canada; Can. J. Earth Sci. 23, 222–237.

3: Red Lake Regional Resident Geologist Report for 2002, Ontario Geological Survey, 61 p.

987: A preliminary ⁴⁰Ar/³⁹Ar study of the thermal history and age of gold in the Red Lake greenstone.

Tectonic Assemblages of Ontario, explanatory notes and legend; Ontario Geological Survey, Map 25

Chart B Archean tectonic assembalges, plutonic suites and events in Ontario; Ontario Geological &

ional strain state and alteration patterns related to gold mineralization in the —Confederation—Woman lakes area; *in* Summary of Fieldwork and Other Activities 1985, Ontario logical Survey, Miscellaneous Paper 132, p.266–275.

: Neodymium Isotope Geochemistry; an Introduction. Springer-Verlag, New York, 187pp.

1998b: The significance of titanite and apatite U-Pb ages: Constraints for the post-magmatic therm hydrothermal evolution of a batholithic complex, Berens River area, northwestern Superior Province

1998: Precambrian geology of the Berens River area, northwest Ontario; Ontario Geological Survey, Open File Report 5963, 116 p. Precambrian Geology, Pipestone Bay; Ontario Geological Survey, Preliminary Map P.3223, scale 1:50 The Superior Province, Canada; in Greenstone Belts (ed. M.J. de Wit and L. Ashwal), p.480–507, 7: Precambrian geology of Heyson Township: Ontario Geological Survey, Preliminary Map Series, Map P-1999: Precambrian Geology: Medicine Stone Lake area; Ontario Geological Survey, Preliminary Map Series, Map P-3397. scale 1:50 000.

Uchi Subprovince; in Geology of Ontario, Ontario Geological Survey, Special Volume 4, Part 1, `93: Precambrian Geology, Red Lake Area. Ontario Geological Survey of Ontario, Preliminary Map P3227, scale 1:50 000. recambrian geology of the Lake St. Joseph area, west half; Ontario Geological Survey, Map P.3050, '97b: Precambrian geology of the Lake St. Joseph area, east half; Ontario Geological Survey, Map P.3051, scale 1:50 000. 19: Geology of the western Birch Lake area, Kenora District, Patricia Portion; Ontario Geological Survey, Open A new metamorphic framework for gold in the Red Lake camp; Ontario Geological Survey, Open File

Physical volcanology and stratigraphy of the Confederation Lake area; District of Kenora (Patricia portion) Ontario Geological Survey Report 236, 117 pp. Operation Kenora-Sydney Lake, Eagle-Sydney Lakes Sheet, District of Kenora; Ontario Div. Mines, Prelim. Map P.1026 Geol. Ser. scale 1:63 360. Precambrian geology of the Birch Lake area, Kenora District; Ontario Geological Survey Preliminary Map P.2387, scale 1:50,000. Operation Kenora-Ear Falls, Brue-Bluffy Lakes Sheet, District of Kenora, Ontario Div. Mines, Prelim. Map

Tomlinson, K.Y., Stevenson, R.K., Hughes, D.J., Hall, R.P., Thurston, P.C., and Henry, P. Williams, H.R., Stott, G.M., Thurston, P.C., Sutcliffe, R.H., Bennett, G., Easton, R.M., and Armstrong, Tectonic Evolution of Ontario: Summary and Synthesis; in Geology of Ontario, Ontario Geological Survey, Special Volume 4, part 2, p.1255–1332.

'81: The Sydney Lake fault zone in Ontario and Manitoba; Canada; PhD thesis, University of Toronto, Toronto, Ontario, 146 o.

terranes and isotopi 3.0-2.87 Ga North Caribou terrane

Sanukitoid suite

ure 3. Sources used in the compilation, keyed to reference list. Box colour represents map scale, and box number

quartz phyric rhyolite flow, Ball granodiorite dyke, Creek Zone, Starratt-Olson pilli-crystal tuff, hanging wall Austin Confederation (McNeely) Madsen powerline conglomerate, Huston diorite dyke, Madsen headframe heterolithic lapilli tuff, Confederation (McNeely) intermediate lithic tuff, Trout Bay rhyodacite tuff, Graves foliated equigranular granodiorite, Little Vermilion Lake rhyolite lapilli tuff, Confederation (McNeely) rhyolitic ash flow breccia, Balmer granodiorite, Abino intrusion rhyolitic crystal tuff, Confederation (Heyson) Cemetery conglomerate, Huston porphyry dyke, surface Campbell Mine, Graves quartz gabbro, A.W. White (Goldcorp) mine quartz-feldspar porphyry dyke, A.W. White (Goldcorp) mine quartz-feldspar pophyry, Brewis porphyry intermediate-felsic tuff, Bruce Channel omblende-biotite granodiorite, Cat Island pluton, Walsh L. K-feldspar granodiorite, Cat Island pluton, Ranger foliated tonalite, North Main phase, Trout Lake batholith wacke, Sundown Lake metasedimentary sequence quartz porphyry, Confederation (Agnew) Fly Lake rhyolite crystal tuff, Confederation (Agnew) high silica vitric felsic tuff, Confederation (Earngey) granophyric granodiorite, Found Lake stock, *Confederation* intermediate-felsic volcanic, Fox Bay andesite (Confederation) intermediate volcanic, Shabumeni Lake, Confederation granodiorite, charnockitic Fletcher Lake batholith

m-Nd Rock Type, Assemblage (Formation) T_(assumed) E Model Age Ref. rhyolitic tuff, Confederation (Heyson) lapilli tuff, Confederation (McNeely) komatiitic basalt, Balmer komatiitic basalt, Balmer komatiitic basalt, Balmer cumulate zone of komatiitic basalt flow, Balmer tonalite-granodiorite, Trout Lake batholith tonalite, Trout Lake batholith granodiorite, Trout Lake batholith diorite, Bluffy Lake Batholith quartz feldspar porphyry, Balmer welded felsic tuff, Confederation (Knott) basalt, Confederation (Agnew) basaltic andesite, Confederation (Agnew) granophyric granodiorite, Found Lake stock basalt, Confederation (Earngey) rhyolite, Confederation (Earngey) 2.735 0.8 2868 t References
1. J.B. Whalen and J.A. Percival (unpublished)

Model ages are based on DePaolo (1988). Locations appear on the map face as yellow triangles, arranged from west (Sm-Nd #80) to east (Sm-Nd #147).

ble 1. U-Pb age data for volcanic, sedimentary, and plutonic rocks of the eastern Uchi Subprovince. Locations

appear on map face as white squares, arranged from west (U-Pb #1) to east (U-Pb #78).

GEOLOGICAL SURVEY OF CANADA

ection Quality Management System, Ottawa, registered to Quality System ISO 9001: 2000 standard

Some geographical names subject to revision.

Mean magnetic declination 2004, 0°29'E, decreasing 4.7° annually. Readings

WESTERN SUPERIOR NATMAP COMPILATION SERIES **GSC OPEN FILE 4256 OGS MAP P.3460** Geology by M. Sanborn-Barrie¹, N. Rogers¹, T. Skulski¹, GEOLOGY AND TECTONOSTRATIGRAPHIC ASSEMBLAGES J. Parker^z, and J. Devaney^z, 1998–2000 **EAST UCHI SUBPROVINCE** Geological compilation by M. Sanborn-Barrie¹, N. Rogers¹, and T. Skulski¹, 2001–2003 RED LAKE AND BIRCH-UCHI BELTS ONTARIO Scale 1:250 000/Échelle 1/250 000 ²Ontario Geological Survey, Sudbury, Ontario kilometres 5 0 5 10 15 20 kilomètres Geographic Information Systems support by D. Lemkow' © Sa Majesté la Reine du chef du Canada 200 © Her Majesty the Queen in Right of Canada 2004

EXPLANATION OF LEGEND CODE map uses codes that are to be read from right to left. An example is given below.

age list (right) and corresponding range in Figure 4: Lithology-age chart.

The **tectonic affinity** (X) describes the environment of deposition or crystallization of a map unit based on all available lithologic and geochemical information. See tectonic affinity lis

Tonalite to granodiorite: medium-grained, variably foliated biotite-, hornblende-biotite tonalite, and associated rocks; cataclastic adjacent to Longlegged Lake-Pakwash Lake fault zone.

Tonalite to granodiorite: medium-grained, variably foliated hornblende- and biotite-hornblende Gabbroic intrusive rocks (various ages) includes gabbro and gabbroic anorthosite exposed in western (Trout Bay) and eastern (Hoyles Bay, Balmer Lake) Red Lake.

Umu2up Ultramafic intrusive rocks of unknown age and affinity. Ugc2tg Tonalite gneiss of unknown age and affinity.

Conglomerate: polymictic pebble and cobble conglomerate consisting of well-rounded volcanic and sedimentary clasts (80%) and ganitoid and/or intrusive clasts (20%); local graded bedding, load casts and flame structures; interbedded wacke. ne siliciclastic rocks±chert, i.e., overlying Trout Bay and Ball assemblages in western Red

nd quartzose wacke, locally cut by gabbro; quartzose wacke may be interbedded with Uus2ft Felsic volcanic rocks: dacite to rhyolite, predominantly tuff and lapilli tuff.

Intermediate volcanic rocks: andesitie to dacite, predominantly tuff and lapilli tuff (i.e., Slate Lake area) with lesser flows (i.e., Pakwash Lake).

Mafic volcanic rocks: foliated, massive to pillowed basalt, amphibolite, and associated gabbro cks, locally plagioclase-phyric near Springpole and Pakwash lakes; lesser associated intermediate to felsic flows, tuff and wacke near Dixie Lake.

Uus2km Ultramafic rocks of uncertain origin and unknown age, west of Red Lake.

and trachyte breccia, syenite, minor fluorite-bearing carbonatite, and associ Quartz monzonite to granodiorite: variably foliated hornblende-bearing quartz monzonite, anodiorite, granite, locally leucocratic and quartz and/or K-feldspar porphyritic.

Granite, granodiorite: massive to weakly foliated, lineated, fine- to coarse-grained Gbe6gr monzogranite±quartz monzodiorite±tonalite and associated pegmatitic rocks, locally K-feldspar Quartz monzonite to granodiorite: variably foliated biotite quartz monzonite, granodiorite al granite; locally leucocratic and quartz and/or K-feldspar porphyritic; xenolithic south of Gullrod

Tonalite to granodiorite: variably foliated biotite-tonalite to quartz diorite±granodiorite; coarse-grained, granular, white to grey with 10-30% biotite±hornblende. Tonalite to granodiorite: variably foliated hornblende-tonalite to quartz diorite±granodiorite; coarse-grained, granular, white to grey with 10–30% hornblende±biotite.

Neoarchean supracrustal rocks of unknown affinity Uus12it Intermediate pyroclastic rocks; dacitic tuff horizons in central Springpole Lake

iorite. quartz diorite: hornblende and biotite-hornblende diorite, syenodiorite±quartz diorite with Gsk11di inclusions of English River metasedimentary rocks locally (i.e. Pakwash pluton) and mafic volcanic rocks (i.e. eastern Bruce Lake pluton). Syenite: amphibole syenite, south of Slate Lake, possibly part of the intermediate to mail sanukitoid suite that has intruded the Uchi-English River interface.

Gabbroic rocks: generally undated gabbroic rocks intrusive into Confederation assemblage, Gmu6gb including fine-grained tholeiitic dykes and sills intrusive into the Sundown Lake metasedimentary assemblage and coarse-grained, magnetite-bearing gabbro dated at ca. 2699

Ma at locality #57; includes Leg Lake mafic complex. Granite, granodiorite: massive to variably foliated biotite granite to granodiorite and associated

pegmatitic rocks, known to be post-volcanic and syn- to post-orogenic. and associated pegmatitic rocks, known to be post-volcanic and s Tonalite, granodiorite: massive to variably foliated biotite±hornblende tonalite to granodiorite, and quartz diorite phases (Bluffy Lake batholith); cataclastic within the Sydney Lake fault zo

Monzodiorite-quartz monzonite-granodiorite of sanukitoid affinity whereby monzodiorite (minor) Gsk12gd is hornblende- and biotite- phyric with high Mg#, Ni, K₂O, Ba, and Sr, and is enriched in LREE; granodiorite is moderately foliated and locally charged with felsic xenoliths; includes monzodiorite and granodiorite of the Faulkenham Lake stock, near Madsen and the Perrigo Lake pluton. Tbe12gr Granite, granodiorite: variably foliated biotite granite to granodiorite±quartz monzonite and associated pegmatitic rocks, known to be post-volcanic and syn- to post-orogenic.

Diorite: diorite-quartz diorite-trondhjemite and associated pegmatite with elevated Mg and 0

Gsk66di consistent with sanukitoid affinity; mafic satellite phase of the 2698 Ma Bluffy Lake batholit

Tbe12tn

Tonalite: massive to weakly foliated biotite-tonalite to trondhjemite±diorite typically associated with, or intrusive into, <2.745 Ga Confederation assemblage. Peraluminous granite to granodiorite: homogeneous diatexite with ≥ 95% medium-grained to

Gms65gr pegmatitic granitoid mobilizate, typically garnet and muscovite bearing; locally apatite an tourmaline bearing (i.e. southeast of Jubilee Lake); commonly contains inclusions and ra inhomogeneous diatexite; cataclastic within the Sydney Lake fault zone. Inhomogeneous diatexite with 70–95% medium-grained to pegmatitic granitoid mobilizate, Gms65gg typically garnet and muscovite bearing, commonly contains inclusions and rafts of metatexite; cataclastic within the Sydney Lake fault zone.

Chert-magnetite ironstone: banded, thinly bedded to thickly laminated chert-magnetite ironstone, Bruce Lake where refolded chert-magnetite ironstone has been tectonically Feg6if ironstone, Bruce Lake where reloided chert-magnitudes and thickened, resulting in mineable reserves (past-producing Griffith Mine).

Granodiorite±monzogranite-diorite: massive to weakly foliated, relatively unaltered and

St. Joseph plutonic suite: synchronous with regional-scale D₂ strain

Wacke: wacke, feldspathic wacke; near northwestern Shabu Lake occurs with lesser quartzite

#72); commonly microcline megacrystic; local inclusions of amphibolite.

St. Joseph Assemblage (Springpole Lake) ca. 2723 Ma Porphyritic tuff: porphyritic lapilli tuff (U-Pb #78).

> "I-Pb #65); cut by fine-grained basaltic dykes. Graves plutonic suite (Red Lake) Kmu72di Diorite to quartz diorite: diorite±quartz diorite, gabbro, syenodiorite, commonly plagioclase orphyritic; includes the 2729 \pm 1.5 Ma Red Crest stock (U-Pb #12) and marginal phases to the

Wacke: thickly laminated to medium-bedded, medium sand size lithic wacke with scours,

Intermediate pyroclastic rocks: intermediate to felsic calc-alkaline pyroclastic rocks including, buff to grey weathering, 2732.8 +1.4/-1.2 Ma tuff (U-Pb #25), and biotite- and plagioclase-phyric

Conglomerate: polymictic conglomerate (U-Pb #17, #38); with immature to well-rounded Fhu34co volcanic, plutonic and sedimentary clasts that locally show evidence of intense hydrotherma alteration, likely prior to reconsolidation and metamorphism; possibly synorogenic with respect to D_1 in the Red Lake belt at ca. 2740–2735 Ma.

Porphyritic rocks: light-weathering, feldspar- and quartz- (± blue quartz) porphyritic, Tcf12pr intrusive/hypabyssal rocks with 20–30% phenocrysts, interpreted to be subvolcanic to the Confederation assemblage. Porphyritic rocks: light-weathering, feldspar- and quartz- (± blue quartz) porphyriti

Diorite-quartz dioritic rocks: with FIII-type REE profiles (high and flat) such as the Swain Lake Zhn12di stock, likely subvolcanic to the FIII-type Agnew sequence in the Birch-Uchi belt, and the tholeiitic Howey diorite, likely subvolcanic to the ca. 2.74 Ga Heyson sequence, Red Lake belt. (Agnew FIII-type sequence); includes the 2741 +3/-2 Ma Found Lake stock (U-Pb #69) and the South Bay porphyry intrusion with associated Cu-Zn-Ag mineralization.

> Felsic dyke at Rahill Beach, Red Lake, interpreted age of 2757+9/-4 Ma (U-Pb #32). Gabbroic rocks: gabbro±gabbroic anorthosite rocks intrusive into, and possibly related to, the

Confederation assemblage ca. 2745-2735 Ma chert with lesser argillite and siltstone. Epiclastic rocks: epiclastic rocks of intermediate composition associated with the Confederation volcanic assemblage. Intermediate volcanic rocks: predominantly intermediate pyroclastic rocks considered to be part of the Confederation assemblage. Mafic volcanic rocks: basaltic rocks considered part of the Confederation assemblage formed at Amphibolite: amphibolite-facies mafic volcanic rocks, locally pillowed east of Dixie Lake,

Earngey sequence (Birch-Uchi belt) ca. 2742-2735 Ma Mafic volcanic rocks: pillow basalt±fragmental rocks of the Wabanook and Neepewa Bay suites vtn minor interbedded intermediate volcanic rocks (e.g. 2741.7 +2.3/-2.2 Ma (Fox Bay Intermediate to felsic volcanic rocks: andesitic to dacite tuff dated at 2735 +4/-3 Ma (Wabunk f74it suite) (U-Pb #71); 2738.8 ± 2 Ma; rhyodacite pyroclastic breccia and lapilli tuff (U-Pb #68);

considered part of the Confederation assemblage.

Intermediate to felsic volcanic rocks: dacite flows with minor tuff, locally perlitic texture; tholeiltic Zcf75ft Felsic volcanic rocks: rhyolitic flows (Keewatin Bay suite) and associated quartz feldspar porphyritic rocks dated at ca. 2744 Ma (U-Pb #66); tholeitic (type FIII) affinity. Mafic volcanic rocks: pillowed basalt and pillow breccia of dominantly tholeiltic affinity. Mafic volcanic rocks: calc-alkaline pillowed basalt flows, pillow breccia, and tuff of dominantly

English River assemblage >2696 Ma <2704 Ma Metasedimentary migmatite: garnet-biotite-feldspar-quartz gneiss, generally metatexite with

Feg6co Conglomerate: polymictic pebble conglomerate e.g., near Madsen (Red Lake) where fragmental Granodiorite±monzogranite: massive to weakly foliated, relatively unaltered and unrecrystallized

Quartz monzonite-granodiorite: massive to weakly foliated amphibole-bearing quartz

megacrysts of K-feldspar and cut by pink granite pegmatite dykes. Includes main phase of the 4 Ma Killala-Baird Batholith (U-Pb #11) and 2703 \pm 2 Ma granite at Job Lake 15 km west of

granodiorite-quartz monzonite, intrusive into deformed and locally mineralized strata; includes the ca. 2712 Ma Little Bear Lake granodiorite (U-Pb #62) and Shabumeni Lake stock (U-Pb Tonalite-granodiorite: variably foliated and recrystallized hornblende and biotite- hornblende

monzonite, commonly with megacrysts of K-feldspar; cut by pink granite pegmatite dykes and Khn71gr monzonite with more dioritic marginal phases, including the 2720 +3/-2 Ma McKenzie Islan stock (U-Pb #29) and 2720 +7/-5 Ma Abino granodiorite (U-Pb #36); locally with microcline

Khn12di Diorite: variably foliated and recrystallized diorite; includes locally augite- and hornblendebearing mafic border phases to the ca. 2.72 Ga Dome and McKenzie Island stocks. Khn71gd Granodiorite: foliated, medium- to coarse-grained biotite-hornblende granodiorite and biotite-hornblende quartz monzonite of the 2724.3 +1.8/-1.5 Ma Mainprize Lake batholith (U-Pb Tonalite: fine- to medium-grained, equigranular, variably foliated, altered, and Au-mineralized tonalite of the 2725 \pm 2.5 Ma Horseshoe Island stock (U-Pb #77).

Conglomerate: massive to poorly-bedded polymictic conglomerate containing pebbleassociated with thickly bedded arenites; lenses of wacke-siltstone.

including the 2731 +3/-2 Ma Little Vermillion Lake batholith (U-Pb #27); calc-alkaline affinity.

Slate Bay assemblage (Red Lake) <2903 Ma

Wacke, siltstone, argillite: well-bedded, graded turbiditic wacke, siltstone±argillite, with marble±chert±sulphides and associated skarn, e.g. adjacent to plutons. tized, intrusive into the Ball assemblage; trace element data indicate affinity with Ball

Ball assemblage (Red Lake) <2925 Ma >2940 Ma locally spherulitic texture, locally plagioclase microphyric.

metamorphosed equivalents on northern Pipestone Bay. Middle felsic to intermediate volcanic rocks: rhyodacitic and rhyolitic flows and tuff with less acitic to andesitic pyroclastic tuff and lapilli tuff; minor spherulitic dacite±siltstone; calc-alkaline Middle mafic to ultramafic volcanic rocks: massive basalt and komatiitic basalt with minor

oclastic tuff and lapilli tuff, with minor spherulitic dacite and chert-magnetite astone±siltstone; minor interlayered basalt flows. Lower basalt: massive to locally pillowed, calc-alkaline basalt.

> a Balmer assemblage, possibly equivalent to the middle komatiite sequence. Balmer assemblage (Red Lake and Birch-Uchi belts) ca. 2992-2964 Ma Rhyolite: upper rhyolite dated at 2964 +5/-1 (U-Pb #40) near Balmertown and possible tuff (felsite) east of Trout Lake batholith dated at ca. 2958.6 \pm 1.7 Ma (U-Pb #56). Felsic volcanic rocks: thinly bedded to massive quartz and feldspar phyric tuff (ca. 2989 Ma

Felsic to intermediate volcanic rocks: rhyolitic to dacitic flows, pyroclastic rocks, and associated epiclastic rocks dated at 2989±3 Ma (Campbell Gold Mine; U-Pb #41), ca. 2988 Ma (Coin Lake; Dacitic volcanic rocks: generally pyroclastic including tuff, 2992 +20/-9 Ma lapilli tuff (U-Pb #35)

Felsic volcanic rocks: including ignimbritic rhyolite flows dated at ca. 2742 Ma (U-Pb #60). Iron-formation, typically < 1 m thick Mafic volcanic rocks: lower massive to pillowed tholeiltic basalt; locally variolitic. Mesoarchean-Neoarchean angular unconformity Mesoarchean unconformity . . Stratigraphic younging derived from pillow shapes Intermediate volcanic rocks: andesitic to dacitic calc-alkaline flows, commonly plagioclase-phyric, possibly correlative with the Earngey sequence of the Birch-Uchi be Stratigraphic younging derived from graded beds (pyroclastic, epiclastic, clastic)

> Western Superior NATMAP Legend Key for the East Uchi map sheet: fv = lithology (see listing below)

Using the legend: e.g. Balmer assemblage felsic volcanic, Xbm59fv

Gabbro: medium-grained gabbro dykes cutting the Balmer assemblage in the Birch-Uchi belt, dated at ca. 2832 Ma on Spot Lake (U-Pb #59). Tonalite-granodiorite: variably foliated tonalite to granodiorite±quartz diorite of the Trout Lake batholith (U-Pb #49, 52, 53, 55); local inclusions of amphibolite; possibly correlative with quartz Tonalite gneiss: heterogeneous, variably foliated, layered and commonly folded gneiss of tonalitic, granodioritic, and quartz dioritic composition, occurring as enclaves within the centra

and southeastern Trout Lake batholith (U-Pb #50); variably cut by concordant to discordant, dykes of tonalite±granodiorite. rout Bay assemblage (Red Lake) ca. 2855-2848 Ma Gabbroic rocks: locally plagioclase megacrystic gabbro and leucogabbro intrusive into lower tholelitic basalt of the Trout Bay assemblage and characterized by depleted REE profiles similar to upper Trout Bay tholeiitic basalt sequence. Mafic volcanic rocks: upper sequence of northeast-facing pillowed tholeiltic basalt flows. piclastic rocks and oxide facies ironstone within central Red Lake.

Knott sequence (Birch-Uchi belt) ca. 2745 –2742 Ma

Intermediate volcanic rocks of andesitic composition.

Mafic volcanic rocks: massive to pillowed calc-alkaline.

Heyson sequence (Red Lake) ca. 2739 Ma

McNeely sequence (Red Lake) ca. 2748-2742 Ma.

Trout Lake plutonic suite ca. 2860-2806 Ma

Mafic volcanic rocks: massive to pillowed tholeiitic basalt, locally plagioclase phyri

Felsic volcanic rocks: rhyolitic rocks of tholeitic (type FIII) affinity (flat to LREE-enric

consisting of rhyolitic flows that may be quartz-phyric and locally exhibit primary low structure; lesser crystal tuff (U-Pb #37); associated gabbro sills.

Intermediate volcanic rocks: massive and pyroclastic rocks of tholeitic affinity, generally dacitic

Mafic volcanic rocks: plagioclase-phyric, massive to pillowed, calc-alkaline basalt±andesite,

Intermediate to felsic volcanic rocks: dacitic to rhyodacitic pyroclastic rocks and associate

epiclastic rocks (U-Pb #10, #14, #16, #23, #28, #39), locally overlying basal conglomerate (un

Oligomictic conglomerate: unbedded, poorly sorted oligomictic conglomerate derived mainly from underlying Balmer assemblage rocks and variably dominated by chemical sedimentary clasts (Wolf Bay, Red Lake) or basaltic clasts (north central shore, Red Lake); minor lithic wacke

Mesoarchean strata and the ca. 2745 Ma Confederation assemblage.

gabbro dated at 2870 ± 15 Ma from the Red Lake belt (Red Lake Mine; U-Pb #43).

nd/or argillaceous beds; interpreted to mark an angular unconformity between Red Lake's

Clastic and epiclastic rocks (U-Pb #3) with minor interbedded intermediate tuff dated at ca. 2854 afic volcanic rocks: lower sequence of northeast-facing pillowed tholeiltic basalt flows, Medicine Rock assemblage (Birch-Uchi belt) < ca. 2870 Ma

Wacke: interbedded hematitic iron-formation and grey brown siltstone exposed at interface between the Narrow Lake and ca. 2870 Ma Woman assemblages and containing detrital zircon of Balmer (ca. 2.99 Ga.) and Woman (2.87–2.88 Ga) age (U-Pb #61). Woman assemblage (Birch-Uchi belt) ca. 2870 Ma

Felsic to intermediate volcanics: ignimbritic to tuffaceous rhyolitic and dacitic flows dated at ca. (U-Pb #64); capped locally by 4 m thick stromatolitic marble. Mafic volcanic rocks: massive to pillowed tholeiitic and calc-alkaline basaltic flows, capped Bruce Channel assemblage (Red Lake) ca. 2894 Ma Feldspathic wacke, siltstone, chert: wacke may be finely crosslaminated and capped by

-magnetite ironstone; includes biotite schist and paragneiss occurring within the contact Felsic to intermediate pyroclastic rocks: felsic to intermediate tuff and lapilli tuff (U-Pb #30, #46). Narrow Lake assemblage (Birch-Uchi belt) < ca. 2975 Ma >2870 Ma

Siltstone: mudstone-dominated facies at the entrance to Slate Bay; commonly Quartz-rich clastic rocks: quartzose wacke, quartz arenite, quartz-rich grit to pebble conglomerate with dominant felsic volcanic clasts; commonly fuchsite-bearing (U-Pb #8, #26,

Ultramafic intrusive rocks: serpentinite, serpentinized peridotite, and rare pyroxenite, variably

Upper ultramafic flows: massive to pillowed komatiite and basaltic komatiite flows. Upper felsic to intermediate volcanic rocks: felsic flows (type FI) intercalated with dacitic flows dated at 2925.4 +3.4/-2.9 Ma (U-Pb #7); white weathering, typically 3-15% quartz phenocrysts,

Intermediate to mafic volcanic rocks: massive basaltic andesite to andesite (Tims Creek) flows with minor dacite dated at ca. 2975 Ma at Spot Lake (U-Pb #58), underlain by minor pillowed Sedimentary rocks: thinly bedded lithic wacke and siltstone locally cut by gabbro dykes

and tuff breccia with clasts more felsic than matrix, locally garnet-bearing. profiles, and middle and upper sequences with TiO₂ <1.5% and flat to depleted LREE profiles.

... Sample site for U-Pb age determination with reference to Table 1 (number 1 to 79) . . . Sample site for Nd isotopic determination with reference to Table 2 (number 80 to 147) . .

sic to intermediate volcanic rock

udes crustal-derived synorogenic granitoid plutons,

rivolcanic plutons and intravolcanic clastic and chemical sedimentary sequences retonic affinity of associated volcanic suite

le lithologies for a given polygon are listed in the map legend for a given coded

Basalt: tholeiitic, massive to pillowed basalt and associated medium-grained equigranular gabbro exposed east of Trout Lake batholith.

ociated spinifex-textured komatiite; includes some serpentinite and gabbro. Intermediate calc-alkaline volcanic rocks: dacitic to lesser andesitic rocks dominated by

Gabbro±diorite±leucogabbro: intrusive into Balmer assemblage, locally plagioclase phyric (i.e.,

Ultramafic volcanic rocks: komatiite±komatiitic basalt, locally with preserved spinifex texture, rming lower (Flat Lake, Russet Lake, Nungessor Road) and middle sequences (Post Narrows Mafic volcanic rocks: tholeiitic basalt, commonly variolitic and pillowed; typically aphyrically sparsely vesicular; consisting of a lower sequence with TiO2>1.5% and flat to enriched LR

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Preliminary Map P.3460, scale 1:250 000.