

LEGEND

PHANEROZOIC

CENOZOIC^a

QUATERNARY

Swamp, bog and peat accumulations; marl; fluvial and lacustrine silt, sand, gravel; glaciofluvial sand, gravel, boulders; sandy, bouldery glacial till

PLEISTOCENE AND HOLOCENE

UNCONFORMITY POST-MIDDLE ORDOVICIAN

Calcite-barite fissure veins locally containing concentrations of galena

PRECAMBRIAN **PROTEROZOIC**

MESOPROTEROZOIC Fenite-Carbonatite Suite (1070-1040 Ma) b

Pink, red and white, quartz-alkali feldspar pegmatite

FAULT CONTACT

Monzonite-Diorite Suite Intrusive Rocks (1090-1070 Ma)

22a Massive monzogranite with igneous textures 22b Massive granodiorite with igneous textures 22c Massive granite pegmatite dikes 22d Massive alkali feldspar granite with igneous textures

21 Syenitic Rocks 21a Massive monzonite with igneous textures 21b Massive alkali feldspar syenite with igneous textures

20 Mafic Rocks 20a Massive diorite with igneous textures

20b Massive gabbro with igneous textures 20c Massive olivine gabbro and pyroxenite, with igneous 20d Massive, anorthositic gabbro and diorite, with igneous 20e Massive, magnetite-rich, porphyritic diorite with igneous

Syenite-Monzonite Suite Intrusive Rocks (1180-1165 Ma) d

19 Monzonite to Diorite 19a Massive to slightly gneissic monzonite, monzodiorite and alkali feldspar syenite, with igneous textures 19b Massive to slightly gneissic, biotite-rich diorite with

REGIONAL METAMORPHISM Alaskite Suite Intrusive Rocks (1250-1240 Ma)

18 Felsic Intrusive Rocks 18a Gneissic, metaluminous to marginally peraluminous alaskite with augen structure and relict igneous

igneous textures

18b Unit 18a with laminated structure and a metamorphic 18c Gneissic, grey, porphyritic alaskite with augen

structure and relict igneous textures 18d Gneissic, contaminated, metaluminous to marginally peraluminous alaskite, formed by the assimilation and reaction of marble with alaskite magma. These rocks are mainly gneissic biotite-hornblende fragment-poor tuff, with relict igneous textures monzogranite and guartz syenite. 18e Gneissic alaskite with augen structure and relict igneous textures; derived from porphyritic,

alaskite; local albite-rich phases Diorite Suite Intrusive Rocks (1270-1240 Ma)

Felsic Intrusive Rocks 17a Massive trondhjemite and granodiorite with igneous

17b Massive granodiorite and minor trondhjemite with igneous textures 17c Gneissic variety of unit 17a with augen structure and relict igneous textures

fine- to medium-grained alaskite and granophyric

17d Massive alkali feldspar syenite with igneous textures 17e Gneissic albite syenite with laminated to augen structure and a metamorphic fabric

16 Mafic Intrusive Rocks 16a Massive, quartz-bearing diorite and tonalite, with

16b Massive diorite, minor gabbro; with local anorthositic

phases and igneous textures 16c Massive gabbro, minor diorite; with local anorthositic phases and igneous textures 16d Massive pyroxenite and peridotite, partly uralitized;

with igneous textures 16e Massive gabbro and diorite sills and dikes; with igneous textures e 16f Gneissic phase of unit 16e with a metamorphic fabric; igneous textures locally preserved e

Late Trondhjemite Suite Intrusive Rocks (1280-1270 Ma)

Albite Granite and Syenite 15a Massive, fine-grained, aphanitic, leucocratic albite granite and minor albite syenite, with igneous

15b Massive, medium-grained albite granite with igneous 15c Massive, medium-grained albite syenite and amphibolerich albite syenite. These rocks are a contaminated

phase of the albite granite, formed by the assimilation and reaction of marble with albite granite magma. 15d Massive, fine-grained, aphanitic, leucocratic albite syenite with igneous textures 15e Massive granodiorite containing numerous xenoliths of

skarn and amphibolite 15f Contaminated intrusive breccia, formed by the reaction of sodic granitic magma with marble 15g Massive alkali feldspar granite with igneous textures 15h Granite pegmatite associated with unit 15f

15i Gneissic equivalent of units 15a and 15b; with augen

to laminated structure and a metamorphic fabric

14 Trondhjemite and Granodiorite 14a Massive trondhjemite and minor granodiorite, with

14b Massive trondhjemite and minor granodiorite, with latephase granite pegmatite dikes 14c Gneissic variety of unit 14b with augen structure and relict igneous textures 14d Unit 14c with granodiorite predominant over trondhjemite

13 Mafic Intrusive Rocks 13a Contaminated gabbro and diorite, formed by the assimilation and reaction of mafic metavolcanic rocks with trondhjemitic magma. These rocks contain numerous inclusions of hornfels and gneissic mafic metavolcanic rock. 13b Massive gabbro and diorite with igneous textures

METASEDIMENTARY ROCKS^f

Calcareous Metasedimentary Rocks 9

12 Calcitic Marble (Medium to High Metamorphic Grade) 12a Medium- to coarse-grained, grey to white, gneissic, calcitic marble containing up to 20% siliceous impurities; locally contains intercalated units of siliceous marble 12b Medium- to coarse-grained, gneissic, siliceous calcitic

> marble containing 20 to 60% siliceous impurities; commonly contains thin intercalated units of amphibolerich metasedimentary rock 12c Skarn developed from calcitic marble; light to dark green, dominated by various mixtures of diopside, amphibole, epidote, titanite, garnet, potassium feldspar, scapolite, calcite and quartz

11 Calcitic Marble (Very Low to Low Metamorphic Grade) 11a Fine-grained, dark grey, calcitic marble containing up

to 20% siliceous impurities; locally contains intercalated units of siliceous, fine-grained marble; well-preserved sedimentary fabric and bedding features 11b Unit 11a containing 20 to 60% siliceous impurities and thin interbeds of calcareous sandstone and siltstone 11c Fine- to medium-grained variety of unit 11a; poorly preserved sedimentary fabric and bedding features 11d Fine- to medium-grained variety of unit 11b; poorly

10 Dolomitic Marble

10a Fine-grained, dark grey, dolomitic marble with up to 20% siliceous impurities; well-preserved sedimentary fabric and bedding features 10b Fine-grained, dark grey to buff, dolomitic marble with

abundant chert beds, containing silicified stromatolites

preserved sedimentary fabric and bedding features

and algal mats 10c Medium- to coarse-grained, gneissic variety of unit 10a, with a metamorphic fabric

10d Medium- to coarse-grained, gneissic variety of unit 10b, with a metamorphic fabric 10e Skarn developed from dolomitic marble

9 Amphibole-Rich Metasedimentary Rocks 9a Metamorphosed calcareous mudstone and sandstone with feathery amphibole porphyroblasts and a metamorphic fabric (diopside-amphibole-plagioclase aneiss locally containing phases rich in potassium feldspar, quartz, biotite, scapolite, epidote, carbonate, titanite, pyrite and iron-titanium oxide minerals); thin intercalated units of siliceous marble (unit 12b) common; may in part be derived

> siliceous clastic metasedimentary rock (unit 8b) 9c Fine-grained calcareous mudstone and sandstone locally with chlorite-actinolite porphyroblasts; sedimentary fabric and bedding features well preserved; thin interbedded units of siliceous marble (units 11b and 11d) common; may in part be derived from calcareous

9b Unit 9a containing thin intercalated units of

9d Unit 9c containing thin interbedded units of siliceous clastic metasedimentary rock (unit 8a)

Siliceous Clastic Metasedimentary Rocks 9 Micaceous Sandy and Conglomeratic Metasedimentary

from calcareous tuff

8a Fine- to medium-grained, feldspathic metagreywackemetasiltstone with a sedimentary fabric and wellpreserved bedding features; presence of finegrained volcanic clasts and bedding features suggests that these rocks were eroded from volcanic terranes and deposited by turbidity currents; may include

thin tuffaceous units 8b Medium to high metamorphic grade, gneissic variety of unit 8a; with a metamorphic fabric and, locally, biotite and garnet porphyroblasts

8c Unit 8a containing metaconglomerate rich in coarse clasts of marble and minor volcanic rocks 8d Polymictic metaconglomerate containing mainly volcanic

Micaceous Shaly Metasedimentary Rocks: Micaceous gneiss and schist with a metamorphic fabric and containing porphyroblasts of one or more of muscovite, biotite, garnet, staurolite and cordierite; possibly represents fine-grained tuffaceous deposits associated with the calc-alkalic to alkalic rhyolite suite (units 5 and 6)

Calc-Alkalic to Alkalic Rhyolite Suite (1260-1245 Ma) h

METAVOLCANIC ROCKS

6 Felsic Metavolcanic Rocks 6a Massive to schistose, metaluminous to peralkalic rhyolite and minor trachyte flows, ash flows

> and fragment-poor tuff, with relict igneous 6b Massive to schistose, potassium feldspar-free, sodic rhyolite and rhyodacite flows, ash flows and

6c Massive to schistose agglomerate 6d Gneissic equivalent of unit 6a, with a metamorphic 6e Gneissic equivalent of unit 6b, with a metamorphic

6f Gneissic equivalent of unit 6c, with a metamorphic

5 Mafic Metavolcanic Rocks

5a Massive to schistose andesite and minor basalt, with relict igneous textures and well-preserved flow features 5b Biotite-hornblende-plagioclase gneiss and amphibolite derived from andesitic and basaltic flows; metamorphic fabric with poorly preserved flow features such as pillows, flow breccia, grain gradation within flows

Andesite-Dacite Suite (1280-1270 Ma)

4 Felsic Metavolcanic Rocks 4a Massive to schistose, rhyodacitic to dacitic tuff and lapilli tuff, with relict igneous textures

4b Massive to schistose, rhyodacitic to dacitic flows and ash flows, with relict igneous textures 4c Massive to schistose agglomerate

4d Gneissic equivalent of unit 4a, with a metamorphic

4e Gneissic equivalent of unit 4b, with a metamorphic 4f Gneissic equivalent of unit 4c, with a metamorphic

3 Mafic Metavolcanic Rocks

gneiss and amphibolite with a metamorphic fabric

3a Massive to schistose andesite and basalt, with relict igneous textures and flow features 3b Gneissic equivalent of unit 3a, consisting of intercalated biotite-hornblende-plagioclase

Tholeitic Basalt Suite (1290-1275 Ma)

Felsic Metavolcanic Rocks 2a Massive to schistose, potassium feldspar-free, sodic

rhyolite and rhyodacite flows and ash flows, with relict ianeous textures 2b Massive to schistose, potassium feldspar-free, sodic rhyolite and rhyodacite tuff and lapilli tuff, with relict igneous textures

Mafic Metavolcanic Rocks 1a Massive to schistose, low- to intermediate-K tholeiitic basalt flows, with igneous textures and well-

2c Massive to schistose agglomerate

preserved flow features 1b Gneissic equivalent of unit 1a, consisting of amphibolite with a metamorphic fabric and poorly preserved flow features

Rusty-weathering, graphitic, pyrite- and pyrrhotitebearing schist

/ IF Layered magnetite-chert iron formation

^a Only the thickest and most extensive Cenozoic deposits in which bedrock outcrops are absent or scarce are shown. b Igneous rock suites and their ages are from Lumbers et al. (1990).

^C Present only in the gneissic Precambrian rocks; only the largest known dikes and areas of marked dike concentrations are shown. **d** Assigned to the syenite-monzonite suite on a lithological basis; radiometric ages not available. ^e Multiple ages represented. Some sills and dikes may be related

to volcanism (units 1 to 6). ^fThe metasedimentary rocks form part of the 1300 to 1240 Ma Hastings Supracrustal Sequence (Lumbers et al. 1990) and are either younger than, or intercalated with, the metavolcanic rocks. **9** Rocks of these groups are subdivided lithologically and the order does not imply age relationships either within or between groups.

are in part contemporaneous with plutonism of the alaskite suite. Metavolcanic rocks of the andesite-dacite suite are in part contemporaneous with plutonism of the late trondhjemite suite. j Most rusty schists are probably hydrothermal replacement deposits in shear zones, but some may represent tuffaceous ironsulphide-bearing sediments or black shales.

h Metavolcanic rocks of the calc-alkalic to alkalic rhyolite suite



Ontario Geological Survey

MAP P.3403

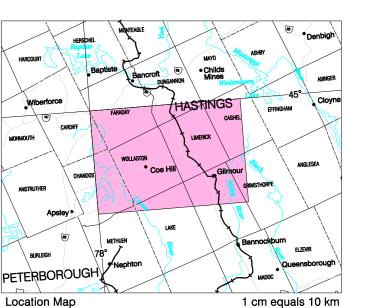
PRECAMBRIAN GEOLOGY

COE HILL AREA

NTS Reference: 31 C/13

1000 m

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SYMBOLS

Geological contact lavering and/or foliation (inclined, magnitude of dip sedimentary, volcanic or other, with facing (inclined, magnitude Pillowed flow; top of dip uncertain) known, magnitude of dip uncertain sedimentary, volcanic Foliation (vertical, or other, with facing inclined, magnitude (vertical, overturned) of dip uncertain) Bedding; sedimentary, volcanic Lineation (with or other, facing plunge, magnitude of unknown (vertical) plunge uncertain) or other, facing

Synform; plunge may unknown (inclined, be indicated magnitude of dip uncertain) Syncline; plunge may Compositional be indicated layering and/or

Antiform; plunge may be indicated foliation (horizontal) Anticline; plunge may layering and/or be indicated parallel tectonic Contact metamorphic foliation (vertical)

x x aureole

SOURCES OF INFORMATION

Base map derived from map 31 C/13 of the National Topographic

Users should be aware that this map sheet lies adjacent to the UTM Zone 17/Zone 18 boundary. To ensure continuity with existing maps of this series to the west, this map is published using a Zone 17 UTM grid, even though most of the area covered by this map lies within UTM Zone 18. Users need to take this into account when making comparisons between the UTM grid on this sheet and Ontario Basic Mapping (OBM) sheets covering this area; when using Global Positioning System (GPS) instruments to determine location, if position is expressed in UTM co-ordinates; and when plotting data on this map from literature sources where location is expressed in

Lumbers, S.B., Heaman, L.M., Vertolli, V.M. and Wu, T.W. 1990. Nature and timing of Middle Proterozoic magmatism in the Central Metasedimentary Belt, Grenville Province, Ontario; in Mid-Proterozoic Laurentia-Baltica, Geological Association of Canada, Special Paper 38,

UTM co-ordinates.

the Ontario Geological Survey. Unpublished undergraduate and post-graduate theses. Magnetic declination approximately 12°22'W in the Coe Hill

Published maps and reports of the Geological Survey of Canada and

Geology not tied to surveyed lines.

Geological compilation by S.B. Lumbers and V.M. Vertolli, 1989-1990. Drafting by P. Londry and E. Amyotte.

Digital conversion under the direction of B. Berdusco.

Geology by S.B. Lumbers and V.M. Vertolli, 1985-1990.

Geology and legend reviewed by M. Easton and B. Berdusco. To enable the rapid dissemination of information, this map has not received a technical edit. Discrepancies may occur for which the Ontario Ministry of Northern Development and Mines does not assume

liability. Users should verify critical information. This map covers an area in the vicinity of other previously released maps (e.g., P.3385, Precambrian Geology, Bancroft Area) and upcoming maps. Although the rock codes for the same lithologic unit may not correspond

from map to map, an attempt has been made to standardize the colour

used on all maps to represent the same rock type.

Information from this publication may be quoted if credit is given. It is recommended that reference to this map be made in the following

Lumbers, S.B. and Vertolli, V.M. 2000. Precambrian geology, Coe Hill area; Ontario Geological Survey, Preliminary Map P.3403, scale