Map 6

Ministry of Natural Resources
Ontario

Hon. Alan W. Pope
Minister

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Deputy Minister

ONTARIO GEOLOGICAL SURVEY
MAP P.2587
GEOLOGICAL SERIES-PRELIMINARY MAP

QUATERNARY GEOLOGY

SYDENHAM AREA

SOUTHERN ONTARIO

Scale 1:50 000

Miles 1 0 1 Mile
Metres 1000 0 1 Kilometre

NTS Reference: 31 C/7
ODM-GSC Aeromagnetic Map: 8392G
OGS Geological Compilation Map: 2418

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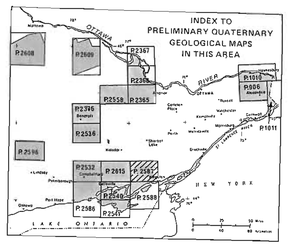

LEGEND

PHANEROZOIC
CENOZOIC
QUATERNARY
RECENT

15 Man-made deposits*; predominantly fill

14 Modern shoreline deposits*;
14a beach deposits; sand, gravel
14b windblown deposits; sand, silt

13 Modern alluvium; unsubdivided; sand, silt, gravel, clay, muck

12 Organic deposits; peat, muck

PLEISTOCENE

11 Older fluvial deposits*; gravel, gravelly sand, sand

10 Windblown (eolian) deposits*; sand, silt

9 Glaciolacustrine shoreline deposits*
9a beach, bar, etc.; sand gravel
9b wave planed deposits; lag gravels, sand, silt

8 Glaciolacustrine shallow water deposits; massive to laminated or bedded sand, silt

7 Glaciolacustrine deeper water deposits; massive to varved or laminated silt, clay

6 Glaciofluvial outwash deposits;
6a proximal; sand, gravelly sand, gravel
6b distal; sand, gravelly sand

5 Glaciofluvial ice-contact deposits; gravel, gravelly sand, minor silt and till

4 Till; very stony, variable matrix

3 Till; silty to sandy, moderately stony

UNCONFORMITY

PALEOZOIC
MIDDLE ORDOVICIAN

2 Bedrock; exposed or with less than 1 m of drift cover

UNCONFORMITY

PRECAMBRIAN

1 Bedrock; exposed or with less than 1 m of drift cover

*Units not present in this map area.

SOURCES OF INFORMATION

Base map from Map 31 C/7 of the National Topographic Series.

Aerial Photographs: Ontario Ministry of Natural Resources, Toronto and National Airphoto Library, Ottawa.

Additional information from water well records, Ontario Ministry of the Environment.

Magnetic declination approximately 11°23'W in 1982.

Metric Conversion Factor: 1 foot = 0.3048 m

CREDITS

Geology by J.G. Leyland, T.S. Russell, and assistants, 1982.

Every possible effort has been made to ensure the accuracy of the information presented on this map; however, the Ontario Ministry of Natural Resources does not assume any liability for errors that may occur. Users may wish to verify critical information; sources include both the references listed here, and information on file at the Resident or Regional Geologist's office and the Mining Recorder's office nearest the map area.

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MARGINAL NOTES

INTRODUCTION

Quaternary geology mapping in the Sydenham area was carried out by the authors in the summer of 1982 assisted by R.A. Roy and A.M. Siechlshen. This area was previously included in a regional physiographic study by Chapman and Putnam (1951, 1966) and by Meynech from 1958 to 1960 (1978). The purpose of the present mapping is to update previous studies and provide a more up-to-date database consistent with similar studies being carried out in Ontario.

Field techniques included the use of soil probes and hand augers, and the examination of natural and man-made exposures. Air photographs were used extensively in conjunction with field checking.

Detailed results of this mapping will be included in a geological report covering this and 8 surrounding map areas (Bath (31 C/2), Yorkshire Island (30 N/15), Tweed (31 C/6), Belleville (31 C/3), Wellington (30 N/14), Campbellford (31 C/6), Trenton (31 C/14), and Consecon (30 N/13), map sheets).

BEDROCK GEOLOGY

Precambrian metasediments and metavolcanics of the Grenville Province (unit 1) are exposed across most of the extreme northern portion of the map area. Paleozoic bedrock (unit 2) is exposed at the surface or underlies Quaternary deposits throughout the remainder of the area. Of the 5 Paleozoic formations occurring in this area the Middle Ordovician, Gull River Formation is the most extensive. The Gull River Formation is composed of lithographic and sublithographic limestone, siltstone, dolomitic limestone, crystalline limestone, and lithographic to finely crystalline limestone (Carson 1981; Liberty 1971). The Bobcaygeon Formation, exposed through a large part of the southwestern corner of the map area, is composed of crystalline and bioclastic limestone and calcarenite.

The bedrock has been strongly modified by glacial erosion resulting in a smooth, often grooved, bedrock surface. Several bedrock escarpments are present in this area. These rock scarps have been strongly modified by glacial erosion.

QUATERNARY GEOLOGY

Glacial Deposits

Glacial deposits in the Sydenham area are of Late Wisconsinan age. The action of the glacial ice was mainly erosional in this area and as a consequence very little glacial sediment was deposited. Till and ice contact sands and gravels are the main types of glacial sediments present.

Drumlin orientation, bedrock striae, and grooves show a main ice movement to the southwest. Cross-cutting striae at Odessa are evidence of a weak, late ice-advance out of the Lake Ontario basin from the east-southeast. No glacial sediments related to this last glacial event are present in this area but are found to the west in the Wellington map area.

Till

Two till types are present in the Sydenham map area. A silty-sand to sandy-silt till (unit 3) occurs as a patchy drumlinized till plain mainly in the western half of the map area. The second till (unit 4) is a very stony, generally clast supported till, with a variable (but usually sandy) matrix found within the northwestern portion of the map area. This latter material exhibits a very unique hummocky topography that was previously referred to as the "Dummer Moraines" by Chapman and Putnam (1951, 1966). The coarse fraction of this deposit is composed almost exclusively of local angular to subangular Paleozoic rock fragments. It is occasionally observed to grade into poorly sorted sandy gravels, probably indicating that the deposit has been washed by glacial meltwater. These characteristics together with the generally very hummocky nature of the deposit suggest that this till melted out of the ice as englacial material.

Glaciofluvial Deposits

Glaciofluvial ice contact deposits (unit 5) occur as esker ridges in the Tamworth area. Small deposits of outwash (units 6a and 6b) are associated with these deposits.

Through the remainder of the area subglacial and proglacial streams followed natural bedrock depressions and valleys. This resulted in the partial or total infilling of some of these low bedrock depressions with ice contact and outwash sands and gravels. Subsequent erosion by modern streams has left remnants of these deposits along valley walls.

Glaciolacustrine Deposits

Massive glaciolacustrine silts and clays (unit 7) occur sporadically throughout the map area. These fine grained deposits are generally on the order of 1 m in thickness. In deeper bedrock depressions, the thickness may increase to several metres.

One deposit of nearshore silts and sands (unit 8) occurs 2 km west of Napanee in association with a raised strandline.

Post Glacial Deposits

Bog and swamp deposits (unit 12) are common throughout the map area. A large deposit of up to several metres thickness occurs along the Precambrian-Paleozoic boundary.

Modern alluvium (unit 13) is present in the major river and stream channels of the area. Development of modern alluvium is restricted by the proximity of the bedrock valley walls.

ECONOMIC GEOLOGY

Outwash deposits contain potential aggregate resources, much of which have already been exploited. Many of these deposits are, however, composed mainly of sand, making them of limited economic use.

Esker and other ice contact deposits contain coarse material making them economically more desirable.

Numerous small quarries occur through the map area. Several of these quarries are still used for the production of crushed stone.

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SYMBOLS

- Glacial striae; direction of ice movement known or assumed
- Drumlin or drumlinoid ridge
- Esker
- Abandoned beach ridge or nearshore bar
- Geological boundary; approximate
- Bedrock escarpment
- Small Precambrian outcrop
- Small Paleozoic outcrop
- Sand or gravel pit; active, abandoned
- Quarry; active, abandoned