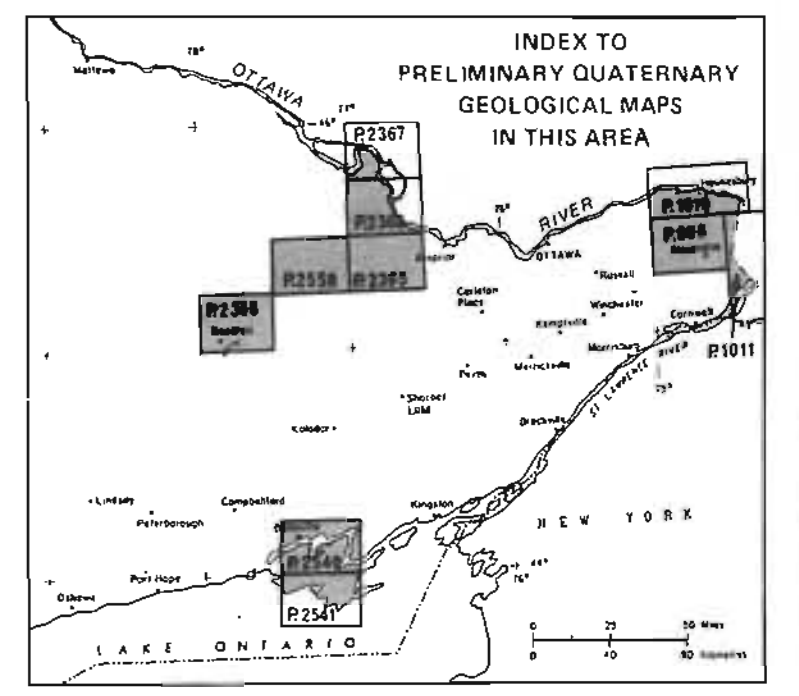

 Ministry of Natural Resources
 Hon. Alan W. Pope, Minister
 W.T. Foster, Deputy Minister

ONTARIO GEOLOGICAL SURVEY
MAP P. 2541
 GEOLOGICAL SERIES - PRELIMINARY MAP
QUATERNARY GEOLOGY OF THE WELLINGTON AREA
 SOUTHERN ONTARIO

Scale 1:50 000
 Mile 0 1
 Metres 0 1000 2000 Kilometre 0 1

NTS Reference: 30 N14
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LEGEND

PHANEROZOIC
 CENOZOIC
 QUATERNARY
 RECENT

15	Man-made deposits, predominantly fill
14a	Modern shoreline deposits; 14a beach deposits; sand, gravel
14b	Modern shoreline deposits; 14b windblown deposits; sand, silt
13	Modern alluvium; unsubdivided; sand, silt, gravel, clay, mud
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	Glaciolacustrine outwash deposits; 6a proximal sand, gravelly sand, gravel; 6b distal sand, gravelly sand
5	Glaciolacustrine ice-contact deposits; gravel, gravelly sand, minor silt and silt
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

Topography from Map 30 N14 of the National Topographic Series
 Aerial Photography; Ontario Ministry of Natural Resources, Toronto, and National Airphoto Library, Ottawa.
 Additional information from water well records, obtained from the Hydrological Data Branch, Ontario Ministry of the Environment.
 Contour interval: 50 feet
 Magnetic declination approximately 10°34' in 1978.
 Metric Conversion Factor: 1 foot = 0.3048 m.

CREDITS

Geology by J.G. Leyland and assistants, 1981
 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.
 This project was funded jointly by the Federal Department of Regional and Economic Expansion and the Ontario Ministry of Natural Resources under the Minerals Program of the Eastern Ontario Subsidiary Agreement.
 Issued 1982
 Information from this publication may be quoted if credit is given. It is recommended that reference be made in the following form:
 Leyland, J.G.
 1982. Quaternary Geology of the Wellington Area, Southern Ontario; Ontario Geological Survey, Map P. 2541, Geological Series-Preliminary Map, scale 1:50 000. Geology 1981.

MARGINAL NOTES

INTRODUCTION

Quaternary geological mapping of the Wellington NTS map sheet (30 N14) was completed during the summer months of 1981 by the author, assisted by J.S. Ross, T.S. Russell and C.R. Boulay.
 Field work involved the examination of natural and man-made exposures. Hand augers and soil probes were used to gather additional data. Examination and sampling of the surficial sediments was done primarily along township roads and, when necessary, on private land with the landowners' permission. Supplementary information was obtained from water well records. Air photographs were used extensively to delineate map unit boundaries.
 This area was previously included in a regional study of Southern Ontario by Chapman and Putman (1951, 1956) and later was mapped by Mynnech (1978) for the Geological Survey of Canada.
 The purpose of the present mapping is to update previous studies and provide more up-to-date information in a format consistent with similar studies throughout the province.

BEDROCK GEOLOGY

The bedrock geology of the area was mapped by Liberty (1961), and re-examined in more detail by Carson (1981).

Two Middle Ordovician bedrock formations (unit 2) underlie the map-area. The following brief descriptions of the bedrock formation are condensed from Carson (1981).
 The stratigraphically lower Verulam Formation consists of finely crystalline limestone, bioclastic limestone and shale. The Verulam outcrops below the escarpments at Picton and around the shores of Prince Edward Bay, South Bay and Smith Bay.
 The remainder of the map-area is underlain by the younger Lindsay Formation. The formation is composed mainly of fine to medium-crystalline limestone with shaly partings and subvolcanic to finely crystalline nodular and shaly limestone.
 These bedrock formations are the main topographic control, being at, or very near (within 1 m), the surface throughout most of the map-area. The area of relatively thick drift between Picton and West Lake is the only exception.

QUATERNARY GEOLOGY

Glacial Geology
 Glacial sediments observed in the area are Late Wisconsinan in age and are related to two glacial ice advances. Both ice sheets moved in a similar direction through the Wellington map-area (trending approximately 240° to 245°). Evidence for these two late-glacial ice movements has

been seen north of this area in the Belleville and Tweed map-areas. The major and oldest glacial movement was from the north-northeast and a minor, younger readvance came from the southeast out of the St. Lawrence Valley. In both cases these glaciers were deflected to the west and parallel to the axis of the Lake Ontario basin.
 Glacial ice movement was primarily erosional in this area producing streamlined bedrock features such as the rock drumlin at McMahon Bluff on Prince Edward Bay.
Till
 Till (unit 3) in the area is not shown where it is less than 1 m thick over bedrock. Consequently only isolated patches associated with drumlinoid and drumlin forms are shown. The major deposits occur between Picton and West Lake. The till is moderately stony with carbonate rock fragments dominating. The matrix textures varies from very sandy to silty, usually with a low clay content.
Glaciolacustrine
 Stratified ice-contact deposits (unit 5) of sand and gravel occur in three esker ridges, trending northeast to southwest in the Cherry Valley area, from Picton to West Lake, and in the Hollowell area. Associated with these esker ridges are outwash sands (unit 6) of probable subsequent origin. These outwash deposits are overlain by nearshore lacustrine sands in most places.



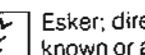
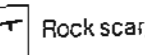
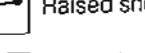
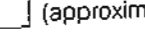
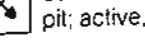
Esker sediments in the West Lake area are covered by younger raised beach and nearshore deposits.
Glaciolacustrine Deposits
 Raised shoreline features (unit 9) are present in the area at elevations between 84 and 91 m (275 to 300 feet). This shoreline is moderately well developed and probably represents a standstill in water level following the high-level glacial Lake Iroquois stage.
 Shallow water sands (unit 8) and deeper water clays (unit 7) occur mainly in topographically low areas, for example the Black River valley, or in areas of pre-existing glacial sediments, particularly between Picton and West Lake.
Eolian Deposits
 Two esker deposits (unit 10) have been recognized in the map-area, one approximately 1 km south of South Bay, and another about 3.5 km south of Bloomfield. The sparsity of windblown sediments overlying older sand deposits indicates rapid stabilization of the surface deposits by vegetation as lake levels dropped or very wet initial climatic conditions.
Bogs and Swamps
 Peat and muck deposits (unit 12) are common throughout the western two-thirds of the map-area. Most of these deposits are relatively thin,

generally of the order of 1 m in depth.
Modern Alluvium
 Minor deposits of modern alluvium (unit 13) occur in the map-area. These are generally composed of an upwards lining sequence of gravels, sands and muds. Most streams in the area flow directly over bedrock and are often incised up to 2 m into a surface layer of bedrock weathered by water and frost action.
Modern Shoreline Deposits
 Baymouth bars composed largely of medium-grained sand (unit 14) separate East Lake and West Lake from the main body of Lake Ontario. Large dune fields are developed on their eastern portions at East and West Lakes.
ECONOMIC GEOLOGY
 Sand and gravel is extracted on demand from all three esker deposits in the area.
 Shoreline deposits are generally too thin and of limited areal extent to be extracted economically. Several small abandoned pits can be found in the larger deposits of sand and gravel.
 Several abandoned pits are present where the bedrock has weathered into up to 2 m of rubble.

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SYMBOLS

-  Drummins or drumlinoid ridges
-  Fluvial
-  Esker, direction of flow known or assumed
-  Rock scarp
-  Raised shoreline
-  Geological boundary (approximate)
-  Sand and/or gravel pit: active, abandoned