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ONTARIO GEOLOGICAL SURVEY  
 MAP P. 2616  
 GEOLOGICAL SERIES - PRELIMINARY MAP  
**QUATERNARY GEOLOGY**  
**LONG POINT AREA**  
 SOUTHERN ONTARIO

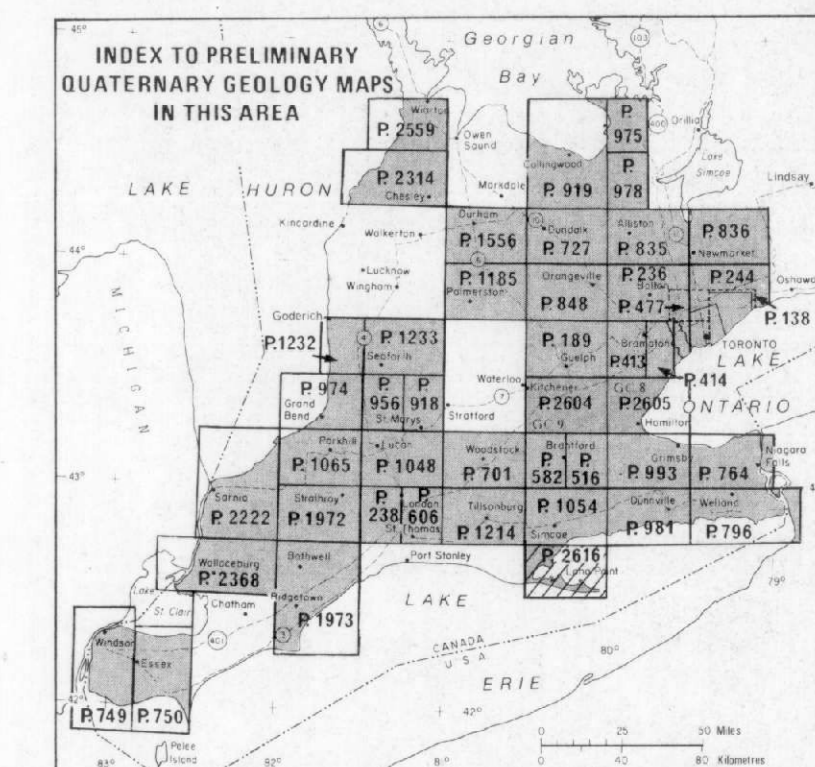
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 Metres 1000 0 1000  
 Kilometre 1

NTS Reference: 40 19  
 ODM GSC Aeromagnetic Map: 4577G  
 OGS Geological Compilation Map: 2418

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**LEGEND**

- QUATERNARY**
- RECENT**
- 11 Fill
  - 10 Modern Lake Erie beach deposits: sand, gravel, and sand
  - 9 Modern alluvium; undifferentiated sand, silt, clay, muck
  - 8 Bog and swamp deposits; muck, peat
- PLEISTOCENE**
- Lake Wisconsinan**
- 7 Older alluvium; medium- to coarse-grained sand, occasional gravel
  - 6\* Glaciolacustrine beach or nearshore deposits; gravel, gravely silt
  - 5 Glaciolacustrine sand deposits; fine- to medium-grained sand
  - 5a Modified slightly by wind
  - 5b Large dune
  - 5c Older, rhythmically bedded very fine to fine-grained sand
  - 5d Older medium- to very coarse grained sand, minor gravel
  - 4 Glaciolacustrine silt deposits; clayey silt to very fine sandy silt
  - 3 Glaciolacustrine clay deposits; clay to silt and clay
  - 2 Wentworth Till; silty clay to silt
  - 2a Silt till
  - 2b Silty clay to clayey silt till
  - 1\* Port Stanley Till; clayey silt to silty clay
- \*These deposits do not occur within the Long Point area, but are found in the Port Burwell area to the west.

**SYMBOLS**

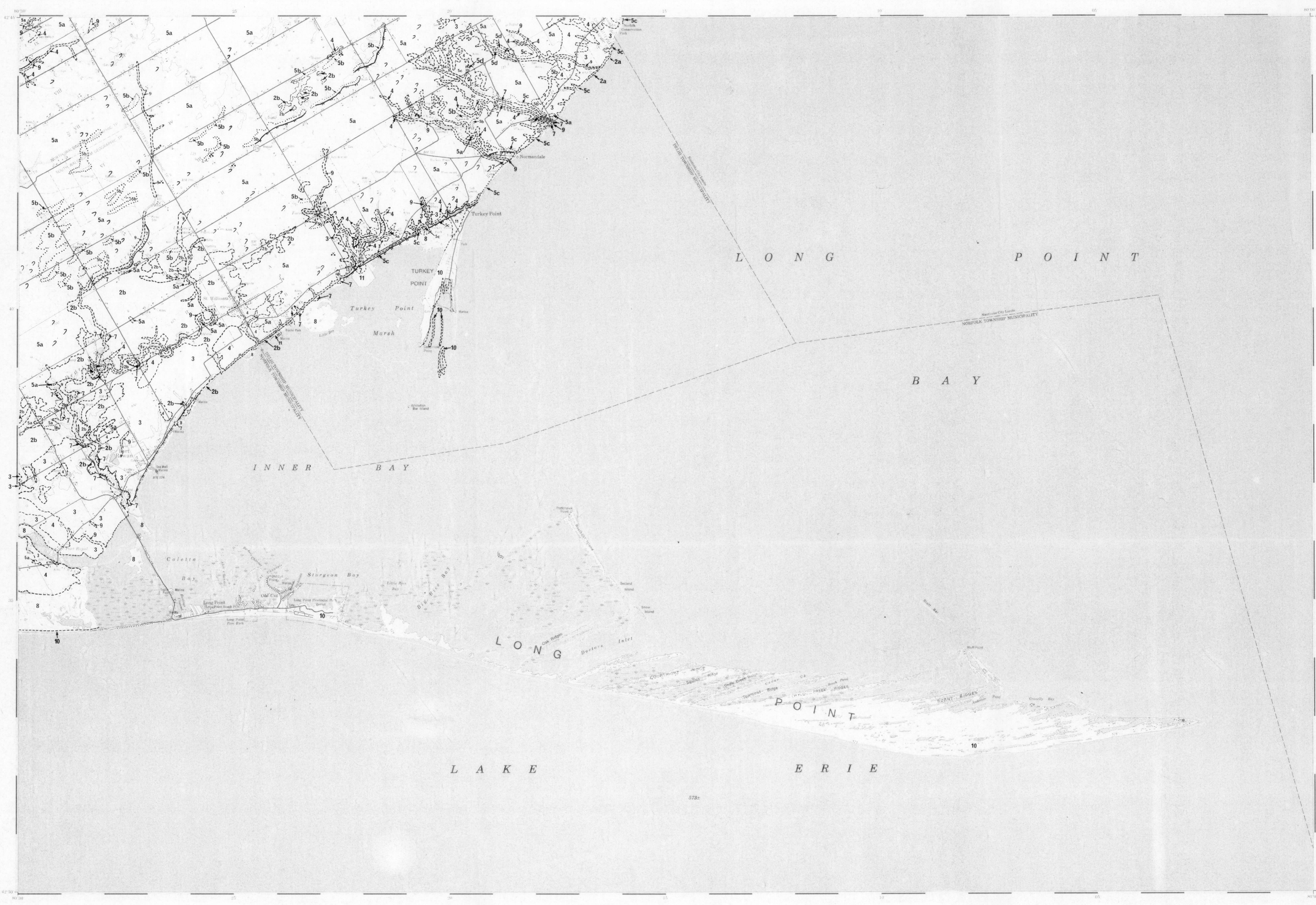
- Geological boundary, approximate, gradational
- Fluvial terrace
- Abandoned shore bluff
- Area of small dunes
- Sand and/or gravel pit

**SOURCES OF INFORMATION**

Base map: National Topographic Series 40 19  
 Air photographs: Ontario Ministry of Natural Resources  
 Contour interval: 25 feet  
 Magnetic declination: approximately 3° 1' in 1977  
 Metric Conversion Factor: 1 foot = 0.3048 m

**CREDITS**

Geology by P. J. Barnett and A. Ziens, 1982, 1983  
 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.  
 Issued 1983  
 Information from this publication may be quoted if credit is given. It is recommended that reference be made in the following form:  
 Barnett, P. J., and Ziens, A.  
 1983. Quaternary Geology of the Long Point Area, Southern Ontario. Ontario Geological Survey, Map P. 2616. Geological Series - Preliminary Map, scale 1:50 000. Geology 1982, 1983.



**MARGINAL NOTES**

**INTRODUCTION**  
 Mapping of the Quaternary geology of the Long Point (NTS 40 19) map area was completed during the summers of 1982 and 1983. The author was ably assisted by Andre Ziens (senior assistant), J. M. Sande, and S. L. Waters in 1982, and J. M. Sande in 1983.  
 Quaternary geological mapping consisted of determining the areal distribution and stratigraphic relationships of sediments of Quaternary age that occur within this region. This involved the examination of natural exposures of the Quaternary sediments along the Lake Erie shorebluffs and along the numerous rivers and creeks of the area. Soil probes and hand augers were used extensively together with air photographs at the scale 1:15 840 to delineate surface map units.  
 Yakutich and Lambers (1970) previously mapped a small part of the area surrounding Big Creek.  
 The legend of this map area is a combined legend created for the Long Point and adjacent Port Burwell (40 110) map area. As a result, several units in the legend do not occur in this map area.

**GEOLOGICAL SETTING**  
 Bedrock does not outcrop within the map area. Quaternary sediments, 30 m to 107 m thick, cover its surface (Barnett and Bacp 1983). Sanford (1969) reported that the Devonian Dundee Formation, a limestone, occurs beneath this thick blanket of Quaternary sediments.

The Quaternary sediments observed in the area were deposited during Lake Wisconsinan and Recent times (about the last 22 000 years). These sediments are predominantly the products of a glacier which once occupied the Lake Erie basin, and of large proglacial lakes which fringed the ice margin during its east-northeast recession.

**TILL**  
 The till within the map area has been subdivided into 2 types (units 2a, 2b), even though it was deposited during the same ice-margin fluctuations. This subdivision is based on differences in the physical properties of the till (texture, structure) which are the result of the different processes of its deposition and on the differences in type of material over-hidden and incorporated by the glacier prior to the deposition of the till.  
 Compact, massive, gritty silt containing between 5% and 10% pebbles, cobbles, and boulder-sized clasts is represented by map unit 2a. This material was deposited beneath an active glacier as basal till (footwall process). It outcrops along the base of the Lake Erie shorebluff northeast of Fishers Glen.  
 Map unit 2b is a reddish brown to grey, silty clay to silt, containing between 2% and 10% clasts. Although the structure of this till is predominantly massive, minor amounts of stratification can be present. This material was deposited for the most part along the margin of a grounded

glacier (recessional moraine) and consists of a general sequence of subaqueous debris flows (debris sliding off the glacier into an ice-dammed proglacial lake) overlain by a massive subglacially deposited till, which is in turn overlain by additional debris flow units. Individual debris flows (flow tills) within the debris flow unit seldom exceed 1 m in thickness and are sometimes only separated by thin wisps of silt or very fine sand. When intervening lacustrine sands, silts, or clays become predominant, the material is classified as glaciolacustrine.  
 Map unit 2b occurs as a northeast-southwest trending belt of outcrops north of St. Williams. It is the southern extension of the Galt Moraine, which passes through the communities of Simcoe, Mount Pleasant, and Cambridge to the north.  
 Sandy debris flows (flow tills) are also exposed along the Lake Erie shorebluff northeast of Turkey Point, but could not be mapped because of their limited extent.  
 All of the above mentioned till facies have been correlated with the Wentworth Till, originally defined by Karow (1963, 1965) in the Hamilton area.

**GLACIOLACUSTRINE SEDIMENTS**  
 Glaciolacustrine sediments have been separated and mapped based on the predominant texture of the material observed. The glaciolacustrine clay (unit 3) contains massive to laminated to thinly interbedded clay, silty clay, and silt. The glaciolacustrine silt (unit 4) contains massive to laminated to thinly interbedded silt, very fine sandy silt, clay, and very fine sand.  
 The glaciolacustrine sand deposits (unit 5) are predominantly fine- to medium-grained sand, massive to finely laminated (ripple and plane bedded). Most of the sand deposits in the area have been modified slightly by the wind (unit 5a), and where large dunes have developed, an attempt has been made to delineate them on this map (unit 5b).  
 Map unit 5c is composed of rhythmically bedded very fine to fine-grained sand, silt, and clay. These materials are older than the surface sands and outcrop predominantly along creeks and the Lake Erie shore. Buried deltaic deposits consisting of medium to very coarse sand containing minor amounts of gravel have also been given a separate subscript (unit 5d). This unit is believed to be the extension of a large buried delta south of Simcoe (Barnett 1978).  
 No beach deposits have been recognized in the map area, although thin gravel lags observed above the till at several localities indicate some degree of water washing. A glacial lake shoreline may be present 3 km north of Forestville, marked by a low step in the lake plain surface.  
 Along several small creeks which enter Inner Bay between Long Point and Turkey Point, small presently abandoned deltas were found (map unit 7, older alluvium). These deltas record a lake level about 6 m above the present Lake Erie level and may correspond to the time when the up-

per Great Lakes drainage re-entered the Lake Erie basin during the Nipissing rise (J. P. Coakley, personal communication, 1983) in the Huron basin, 6000 years ago (Prest 1970).

**FLUVIAL SEDIMENTS**  
 Alluvium (material deposited along rivers by lateral and vertical accretion) has been divided into 2 units, older and modern alluvium.  
 Older alluvium (unit 7) (deposited by anastomosing streams) is found along terrace remnants above the modern flood plains. It is typically a medium- to very coarse grained sand that may contain gravelly zones in this area.  
 Modern alluvium (unit 9) (material deposited by the present day creeks) is composed of sand, silt, clay, and/or muck.

**BOG AND SWAMP SEDIMENTS**  
 Bog and swamp deposits are sediments high in organic content, predominantly muck and peat. The Turkey Point Marsh and the Long Point Marsh are major areas of organic sediment accumulation in the Long Point map area.

**LACUSTRINE SEDIMENTS**  
 Beach sediments along the Lake Erie shoreline (unit 10) are usually narrow and sandy, containing minor amounts of gravel-sized particles. The large spits at Turkey Point and Long Point are notable exceptions. Within this unit some dune sands are included.  
 Large areas which have been changed by man, either by adding material or reclaiming land by building dikes, are included in map unit 11 as fill.

**RESOURCES**  
 Gravel resources in the map area are scarce. Gravel and gravely sand has been extracted along the 3 creeks located north of Turkey Point. Further extraction of these deposits is hindered by a thick cover of glaciolacustrine silts and clays and their relatively low gravel content.  
 Sand has been extracted from the large dunes (units 5b, 5a) throughout the sand plain area, predominantly for fill and to increase the amount of level acreage available for cropland. Only the sand pits active during 1982 and 1983 are marked on the map.  
 Iron was produced between 1823 and 1848 at the Van Norman Foundry, located at Normandale. Local sources of bog iron ore and oak were used in the smelting process.

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