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GEOLOGICAL SURVEY OF CANADA

DEPARTMENT OF ENERGY, MINES AND RESOURCES

PAPER 71-49

GEOLOGY AND ENGINEERING DESCRIPTION OF THE SOILS IN THE WELLAND—PORT COLBORNE AREA, ONTARIO

(Report, 7 figures and Map 8-1971)

E. B. Owen

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(30 L/14g, L/14b)

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DEPARTMENT OF ENERGY, MINES AND RESOURCES

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GEOLOGY AND ENGINEERING DESCRIPTION OF THE SOILS IN THE WELLAND - PORT COLBORNE AREA, ONTARIO.

This report consists of two maps, at a scale 1:25,000, describing the surficial materials occurring in the Welland - Port Colborne area, Ontario and the topography of the underlying bedrock. The data for the accompanying geological sections was obtained by examining the materials exposed on ground surface, during excavations for the Welland Canal By-Pass Project and from test borings put down by The St. Lawrence Seaway Authority previous to and during construction of the By-Pass.

The data for the six graphs depicting some of the engineering properties of the soils was provided by The St. Lawrence Seaway Authority. Information on bedrock elevations was obtained chiefly from test borings put down by The Authority and from hammer seismic surveys conducted by the Exploration Geophysics Division of the Geological Survey of Canada. These, and other data sites, are shown on the map.

ÉTUDE GÉOLOGIQUE ET GÉOTECHNIQUE DES SOLS DE LA RÉGION DE WELLAND - PORT COLBORNE, ONTARIO.

L'objet de ce rapport est de présenter deux cartes à l'échelle de 1:25,000 décrivant les matériaux que l'on trouve en surface dans la région de Welland - Port Colborne, Ontario, et la topographie de l'assise rocheuse sous-jacente. Les données qui ont servi à établir pour la partie géologique proviennent de l'examen des matériaux mis au jour lors des travaux d'excavation de la dérivation du canal Welland et de forages d'étude entrepris par l'Administration de la Voie maritime du Saint-Laurent avant et pendant la construction de cette dérivation.

Ces données ont servi à l'élaboration de six graphiques qui donnent quelques-unes des propiétés géotechniques des sols, elles ont été fournies par l'Administration de la Voie maritime du Saint-Laurent. Les cotes de profondeur de l'assise rocheuse ont été obtenues à partir de forages d'étude par ce même organisme et par des levés séismiques au marteau effectués par la Division de la Géophysique d'Exploration de la Commission géologique du Canada; de même que les sources d'autres données sont indiquées sur les cartes.

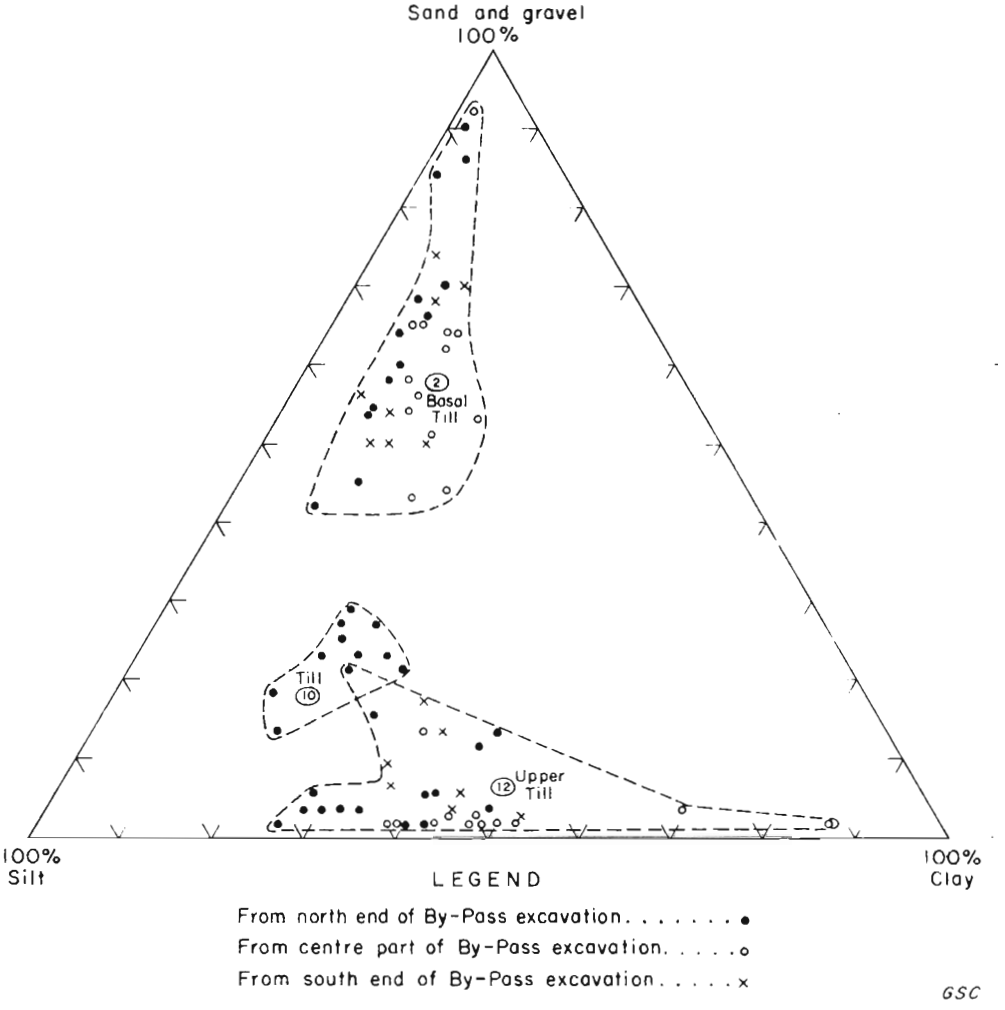

Figure 1. Mechanical compositions of tills (Unit Nos. 2, 10 and 12).

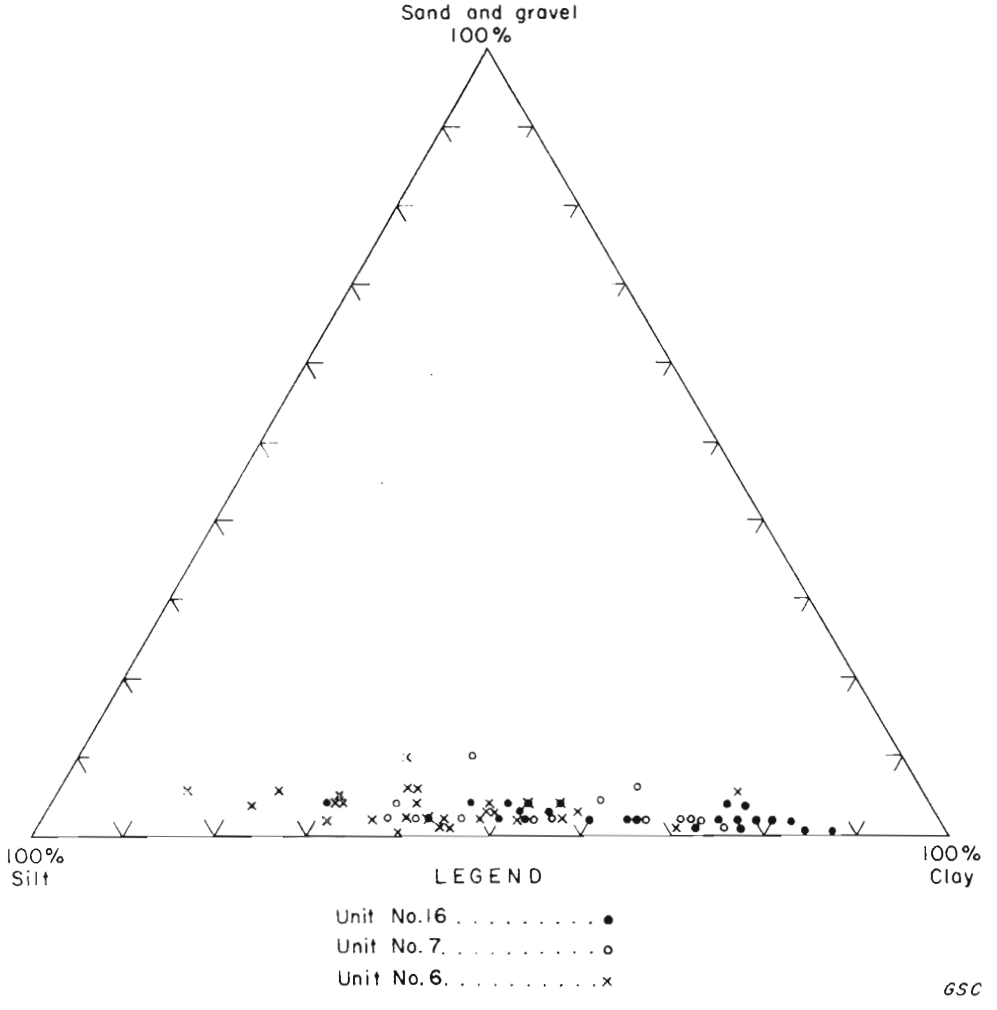

Figure 2. Mechanical composition of lacustrine soils (Unit Nos. 6, 7 and 16).

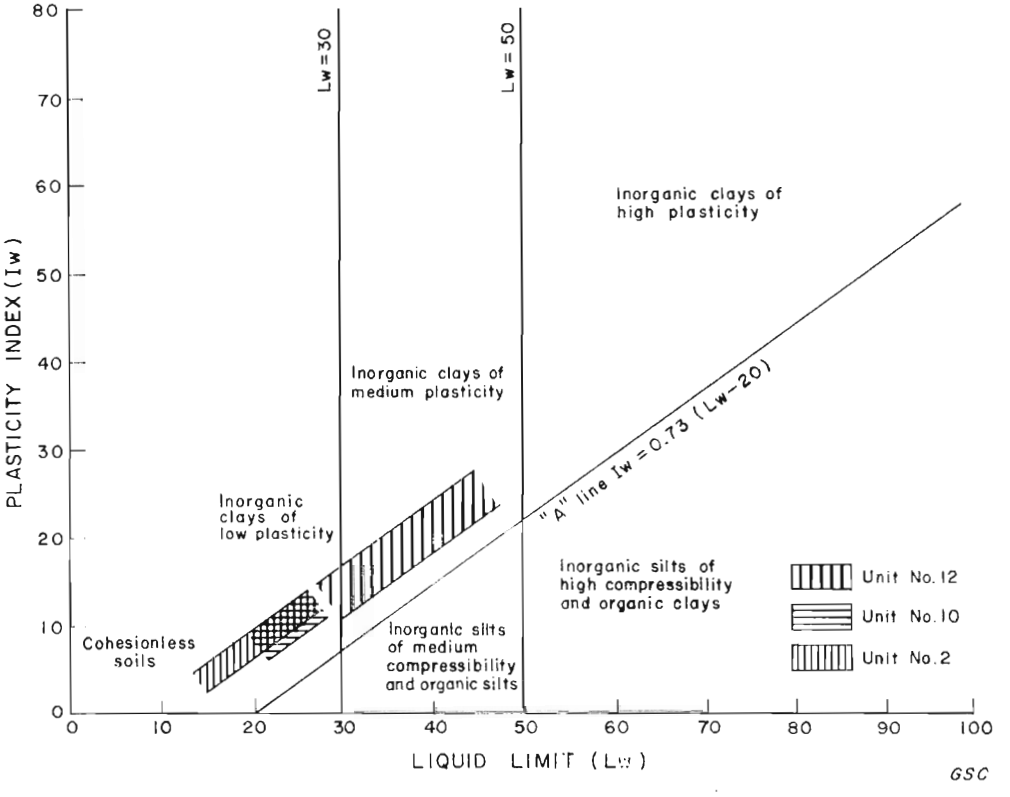

Figure 3. Relation between liquid limit and plasticity index for tills (Unit Nos. 2, 10 and 12).

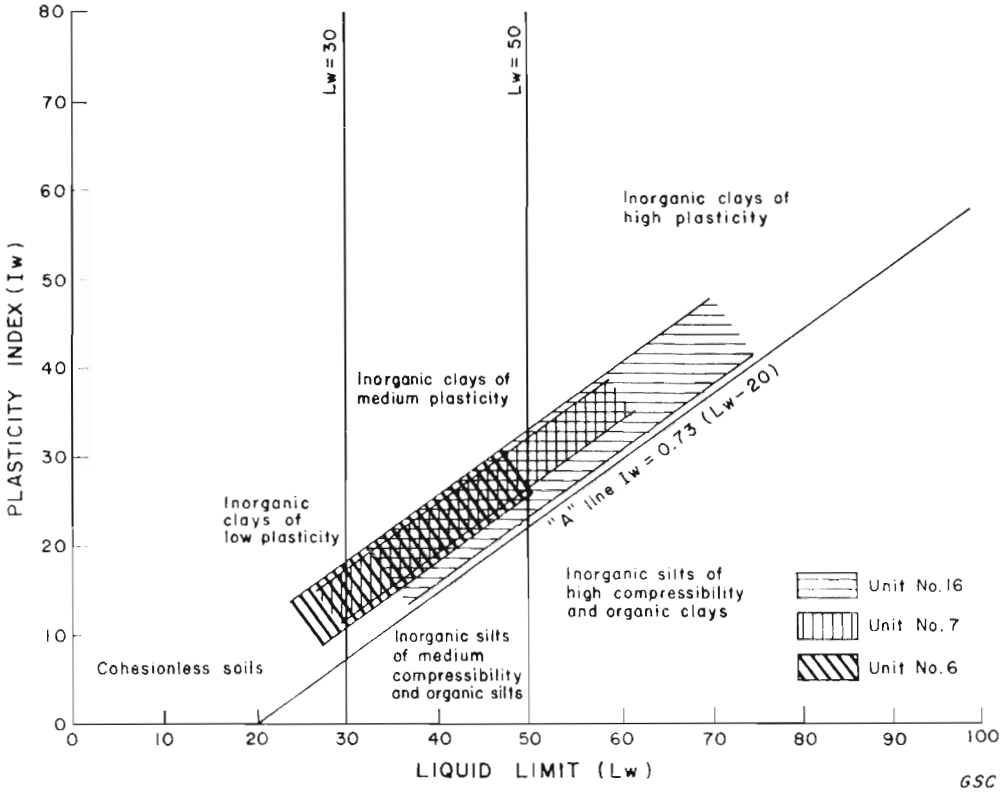

Figure 4. Relation between liquid limit and plasticity index for lacustrine soils (Unit Nos. 6, 7 and 16).

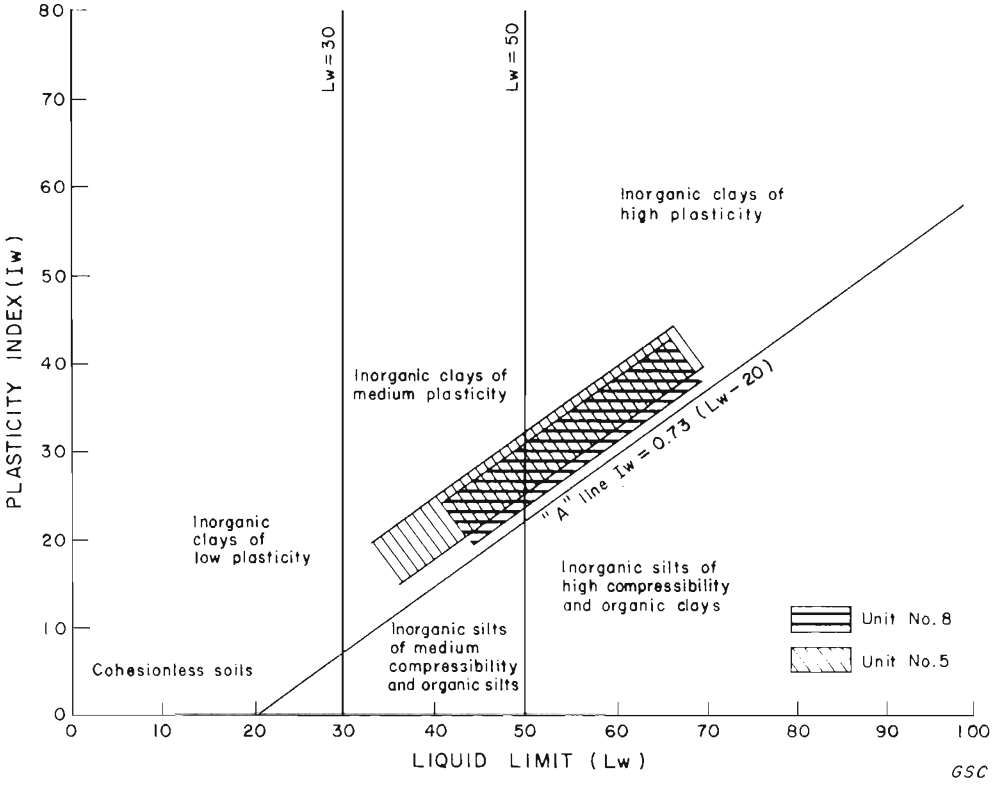

Figure 5. Relation between liquid limit and plasticity index for varved clays (Unit Nos. 5 and 8).

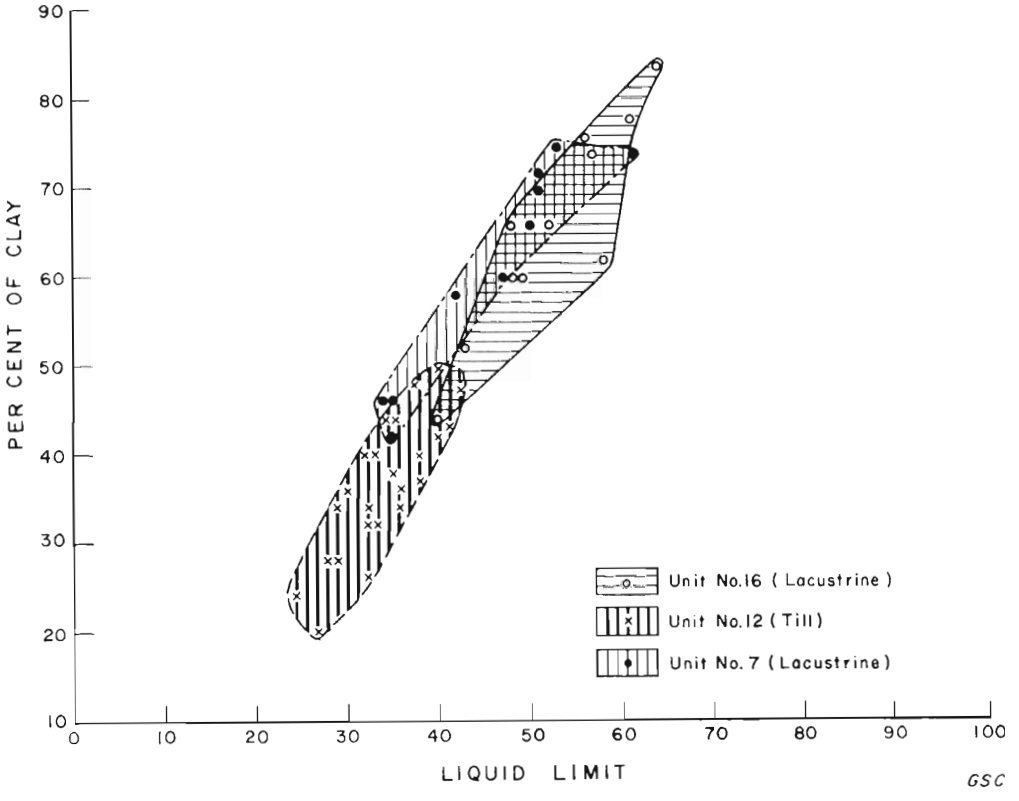

Figure 6. Relationship between liquid limit and clay content for till (Unit No. 12) and lacustrine soils (Unit Nos. 7 and 16).