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MARGINAL NOTES

Geological mapping of the area required by E. Wilson (1946) for the Geological Survey of Canada (GSC) and later included in her major publication of the Chateaugay and the Ottawa Valley (Wilson 1946). The lowland is characterized by Paleozoic bedrock intersected by a system of normal faults striking northeast to southwest.

PALEOZOIC STRATIGRAPHY

The maximum thickness of Paleozoic rock intersected in a drill-hole is 870.2 m (Consumer's Gas Company Drilling 1506 (DHR-1) in lot 11, concession I, Russell Township; the Ottawa Dary well (DHR-23) was drilled to 387.1 m in lot 12, concession II, Russell Township; the Standard Oil Vars well (DHR-25) was drilled to 304.8 m in lot 25, concession IX, Cumberland Township; the Standard Oil Carleton Place well (DHR-26) was drilled to 885.2 m in lot 15, concession XI, Cumberland Township; and Consumer's Gas Company Drilling 12022, 12417, 16060 to 16062, and 16306 to 16322 (DHR-1 to DHR-2) were drilled to a maximum depth of 686.1 m in lots 14 to 16, concessions I and II, Russell Township, and lots 11 to 21, concessions X and XI, Chateaugay Township in the Ontario Geological Survey (OGS) SSS No 10 well (DHR-27) (Johnson 1982) was drilled to 618.9 m in lot 15, concession XI, Cumberland Township. The drill core for the GSC Russell well is at the GSC core storage in Ottawa, and has been reworked for use as a reference section.

The common occurrence of normal faults has resulted in the exposure of Paleozoic rock at various levels within the sequence, and Precambrian rock is exposed in the fault block along the Ottawa River in the northern part of the area.

Equivalent Paleozoic rock units occur in the Montreal area and units equivalent to those of the upper part of the Ottawa Valley sequence occur in southern Ontario west of the Frontenac Axis.

Libery (1967, 1969) has recommended the application of the lithostratigraphic nomenclature from the latter region to the Ottawa-St. Lawrence Lowland. The current mapping supports this recommendation, and usage of the terms "Gull River Formation", "Bobbycoygen Formation", "Verulam Formation", and "Lindsay Formation" is therefore adopted. They correspond to Units 4 to C, Unit D, Unit E, and Unit F respectively, of Williams and Wolf (1982, p. 133). It is recommended that the name "Ottawa" be elevated to Group status.

The Nepean Formation (Wilson 1946, p. 10-12) outcrops in the northern part of the map area near Rockland. A total thickness of 145.1 m was intersected in the GSC Russell well.

The March Formation (Wilson 1946, p. 12-14) outcrops in the extreme northeastern part of the map area. A total thickness of 111.9 m was intersected in the GSC Russell well.

The Oxford Formation (Wilson 1946, p. 14-16) outcrops in the northwestern and extreme southwestern parts of the map area. A total thickness of 113.3 m was intersected in the GSC Russell well.

The Rockcliffe Formation (Wilson 1946, p. 17-19) outcrops in the northern part of the map area. A total thickness of 21.6 m was intersected in the GSC Russell well.

The Gull River Formation (Middle Ordovician) (Unit 6) The Gull River Formation outcrops in the northern and southern parts of the map area. A total thickness of 48.3 m was intersected in the GSC well at Russell.

The Bobbycoygen Formation (Middle Ordovician) (Unit 7) The Bobbycoygen Formation (Unit D of Williams and Wolf 1982) outcrops in the northern and southern parts of the map area. A total thickness of 85.0 m was intersected in the GSC Russell well.

The Verulam Formation (Middle Ordovician) (Unit 8) The Verulam Formation (Unit E of Williams and Wolf 1982) outcrops in the southern part of the map area. A total thickness of 32.0 m was intersected in the GSC Russell well.

The Lindsay Formation (Middle-Upper Ordovician) (Unit 9) The Lindsay Formation (Unit F of Williams and Wolf 1982) outcrops and subsists beneath surficial deposits in approximately 50% of the map area. A total thickness of 32.0 m was intersected in the GSC Russell well.

The Queenston Formation (Upper Ordovician) (Unit 13) The Queenston Formation, named by Grabau (1908) for the town of Queenston (located in the Niagara Peninsula) outcrops in the southwestern part of the map area. A total of 12.8 m of the formation was intersected near the top of the GSC Russell well and the log for Consumer's Gas Company No. 16306 suggests that an additional thickness of approximately 40 m exists within the area.

The Carleton Place Formation (Upper Ordovician) (Unit 12) The Carleton Place Formation (Wilson 1946, p. 28-30) outcrops in the central and southwestern parts of the map area. A total thickness of 102.2 m was intersected in the GSC Russell well. The Russell Formation of Wilson (1946, p. 30) is not considered to be mappable separately, and the recommendation is made here that it be included within the Carleton Place Formation.

**EASTVIEW FORMATION (UPPER ORDOVICIAN) (UNIT 10)**  
The Eastview Formation (Wilson 1946, p.26-27) does not form part of the bedrock surface in the map area, but it is inferred to occur beneath younger Paleozoic units. A total thickness of 10.1 m was intersected in the GSC Russell well and a total thickness of 10.7 m in the OGS SSS No 10 well in Cumberland Township.

**BILLINGS FORMATION (UPPER ORDOVICIAN) (UNIT 11)**  
The Billings Formation (Wilson 1946, p.27-28) outcrops in the western part of the map area. A total thickness of 53.9 m was intersected in the GSC Russell well.

**CARLETON PLACE FORMATION (UPPER ORDOVICIAN) (UNIT 12)**  
The Carleton Place Formation (Wilson 1946, p.28-30) outcrops in the central and southwestern parts of the map area. A total thickness of 102.2 m was intersected in the GSC Russell well. The Russell Formation of Wilson (1946, p.30) is not considered to be mappable separately, and the recommendation is made here that it be included within the Carleton Place Formation.

**QUEENSTON FORMATION (UPPER ORDOVICIAN) (UNIT 13)**  
The Queenston Formation, named by Grabau (1908) for the town of Queenston (located in the Niagara Peninsula) outcrops in the southwestern part of the map area. A total of 12.8 m of the formation was intersected near the top of the GSC Russell well and the log for Consumer's Gas Company No.16306 suggests that an additional thickness of approximately 40 m exists within the area.

**STRUCTURAL GEOLOGY**  
The map area is transected by a series of steeply dipping normal faults and fault zones striking subparallel to the Ottawa River, which itself follows a fault trace. Bedding normally close to horizontal, often dips steeply adjacent to faults and within fault zones. Fault traces are generally straight but are commonly curved in the vicinity of fault intersections. Faults consist of a single fault branching from another fault. Several major fault junctions, involving a larger number of faults, occur in the south-western part of the area. The displacement at a fault junction is approximately equal to the sum of the displacements along each set of faults which branches from the junction.

**ECONOMIC GEOLOGY**  
The Bobbycoygen Formation is quarried for use as aggregate, presently licensed operations being the Embury Quarry of A.L. Blair Construction Limited (lots 6 and 7, concession VII, Russell Township).

**REFERENCES**  
Barnes, C.R.  
1966: Reply: Stratigraphy and Sedimentary Environments of Some Wilderness (Ordovician) Limestones, Ottawa Valley, Ontario. Canadian Journal of Earth Sciences, Volume 3, p. 169-172.

**REFERENCES**  
Barnes, C.R.  
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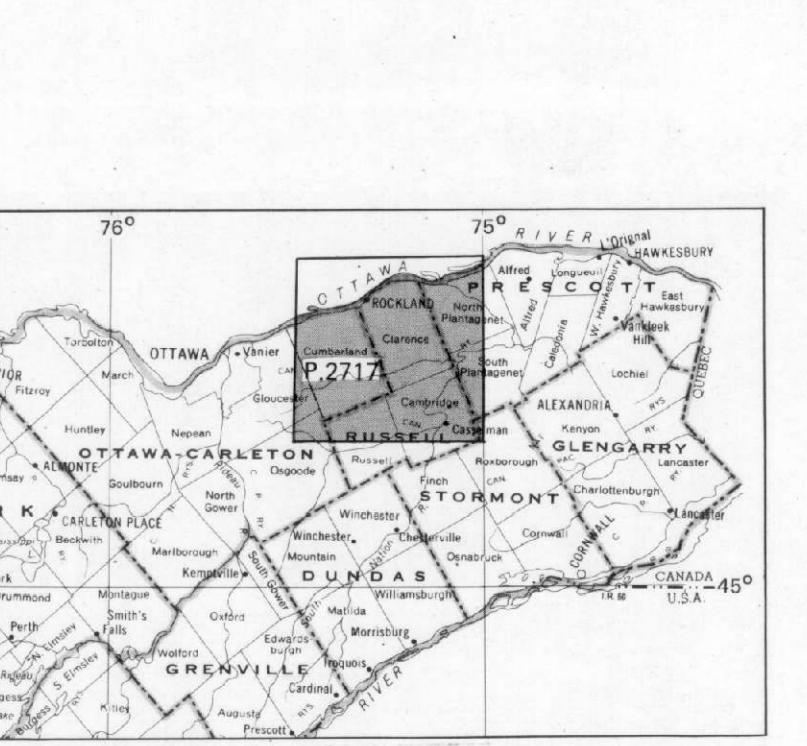
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Ontario Geological Survey  
Ministry of Natural Resources  
Hon. Michael Harris  
Minister  
Mary Mofford  
Deputy Minister  
MAP P.2717  
Geological Series - Preliminary Map  
PALEOZOIC GEOLOGY  
RUSSELL-THURSO AREA  
SOUTHERN ONTARIO  
Scale 1:50 000  
NTS References: 31 G/6-11  
OGS Geological Compilation Map: 2418

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LEGEND  
PHANEROZOIC  
PALEOZOIC  
UPPER ORDOVICIAN  
13 Queenston Formation: red to light greenish grey siltstone and shale, with interbeds of silty bioclastic limestone in lower part  
12 Carleton Place Formation: interbedded dark grey shale, fossiliferous calcareous siltstone, and silty bioclastic limestone  
11 Billings Formation: dark brown to black shale, with laminations of calcareous siltstone  
10 Eastview Formation\*: interbedded siltstone and shale, with thin beds of limestone and dark brown to dark grey shale  
MIDDLE-UPPER ORDOVICIAN  
9 Lindsay Formation: sublitographic to fine crystalline limestone, nodular in part, with interbeds of calcareous and shale  
MIDDLE ORDOVICIAN  
8 Verulam Formation: interbedded bioclastic limestone, sublitographic to fine crystalline limestone and shale  
7 Bobbycoygen Formation: interbedded calcareous and sublitographic to fine crystalline limestone  
6 Gull River Formation: interbedded silty dolomite, lithographic to fine crystalline limestone, oolitic limestone, and fine-grained calcareous quartz sandstone  
5 Rockcliffe Formation: interbedded fine-grained light greenish grey quartz sandstone, silty limestone, and shale, locally conglomeratic at base; interbeds of calcareous (St. Martin Member, 6a) and silty dolomite in upper part  
LOWER ORDOVICIAN  
4 Oxford Formation: sublitographic to fine crystalline dolomite  
3 March Formation: interbedded quartz sandstone, silty dolomite, and dolomite  
CAMBRO-ORDOVICIAN  
2 Nepean Formation: fine- to coarse-grained quartz sandstone, partially calcareous in upper part  
1 Covey Hill Formation: noncalcareous, lithographic, fine- to coarse-grained quartz pebble conglomerate  
PRECAMBRIAN  
PC Undifferentiated metamorphic and igneous rocks

NOTE: \*This unit does not appear on the map face. It occurs in some drillholes.

SYMBOLS  
X Bedrock outcrop  
Quarry  
Geological boundary position approximate  
Fault position approximate (arrow indicates downthrown side)  
Drillhole, with reference number\*

Reference Numbers  
R-1 Consumers' Gas Co. 19027 R-10 CCG No. 16316  
R-2 Consumers' Gas Co. 12417 R-11 CCG No. 16316  
R-3 Consumers' Gas Co. 16090 R-12 CCG No. 16317  
R-4 Consumers' Gas Co. 16091 R-13 CCG No. 16318  
R-5 Consumers' Gas Co. 16062 R-14 CCG No. 16319  
R-6 Consumers' Gas Co. 16096 R-15 CCG No. 16320  
R-7 Consumers' Gas Co. 16007 R-21 CCG No. 16321  
R-8 Consumers' Gas Co. 16098 R-22 CCG No. 16322  
R-9 CCG No. 16309 R-23 Ottawa Drilling  
Field No. 16310 R-24 GSC Russell  
R-11 CCG No. 16311 R-25 Standard Oil  
R-12 CCG No. 16312 R-26 Standard Oil  
R-13 CCG No. 16313 R-27 CCG No. 16314  
R-14 CCG No. 16314 R-28 CCG Springs

SOURCES OF INFORMATION  
Base map from maps 31 G/6 (Russell) and 31 G/11 (Thurso) of the National Topographic Series.  
Subsurface information from Ontario Ministry of Natural Resources and gas well summary cards, Petroleum Resources Section, London.  
Contour interval 25 feet.  
Magnetic declination approximately 13°12'W in 1982.  
Metric conversion factor: 1 foot = 0.3048 m.

CREDITS  
Geology by D.A. Williams, A.M. Rae, and R.R. Wolf, 1982.  
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Williams, D.A., Rae, A.M. and Wolf, R.R.  
1985: Paleozoic Geology of the Russell-Thurso Area, Southern Ontario. Ontario Geological Survey Map P.2717, Geological Series-Preliminary Map, scale 1:50 000. Geology 1982.